5S-P-005

Program Writer

User Manual

Version 0.00 – June 15, 2026

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Revision History:

Revision	Date	Description
0.00	2026/06/15	Preliminary version

1. About 5S-P-005 Writer

The 5S-P-005 is a new programmer launched by PADAUK Technology, characterized by the fact that it eliminates the need for jumper configuration on the programming pins. It can automatically detect the number of IC package pins and set programming pins directly via software, enabling direct programming. This simplifies the programming workflow and procedures, improving the efficiency of programming setup. In addition, it is equipped with a new expansion communication interface for communication with other test fixtures, increasing programming flexibility.

1.1. The front

(1) Power Switch: OFF/ON.

(2) Power interface: Please use the exclusive power converter of Program Writer accessories.
(Do not use other power converters to avoid damaging the 5S-P-005)

(3) USB interface: Connect to PC.

(4) Extension Interface: Enables communication with external devices.

(5) Handler: Semi-automatic programming interface.

(6) Buzzer: Alarms upon programming failure.

(7) LED (OK & Fail) Indicators: Display programming outcome.

(8) LCM Display: Shows programming status and results.

(9) Writer Button: Initiates programming process.

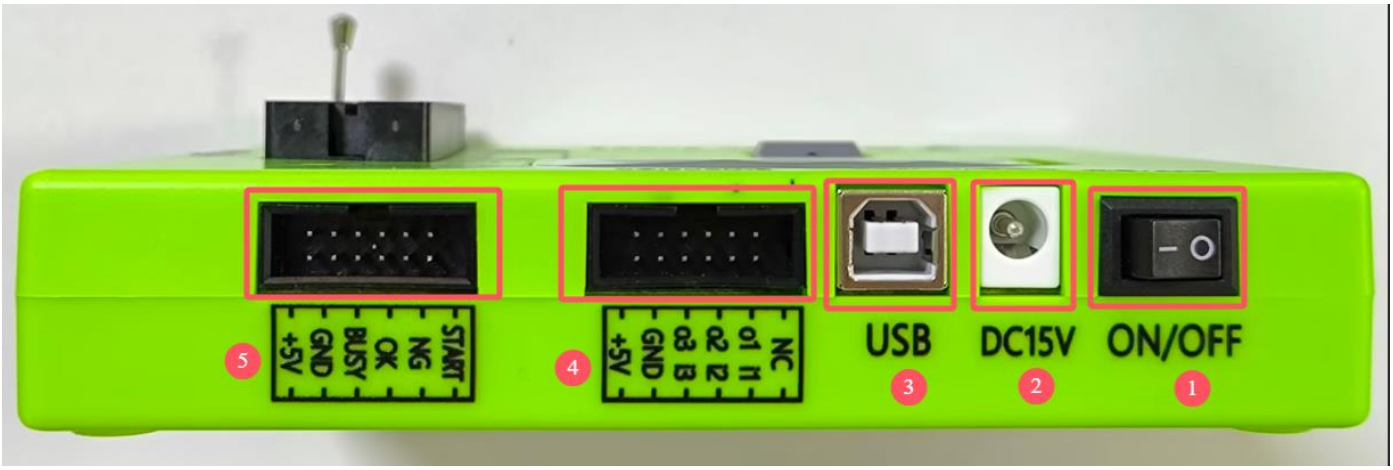
(10) BOOT button: For firmware anomalies, enabling forced restart and update.

(11) Programming socket: Compatible with DIP packages (supports up to 28 pins).

(12) GND interface: Grounding interface shared with semi-automatic programming equipment.

(13) On-board-program(pgm) interface: On-board programming interface and programming socket pin connection port.

1.2. Front side



(1) Power switch: OFF/ON.

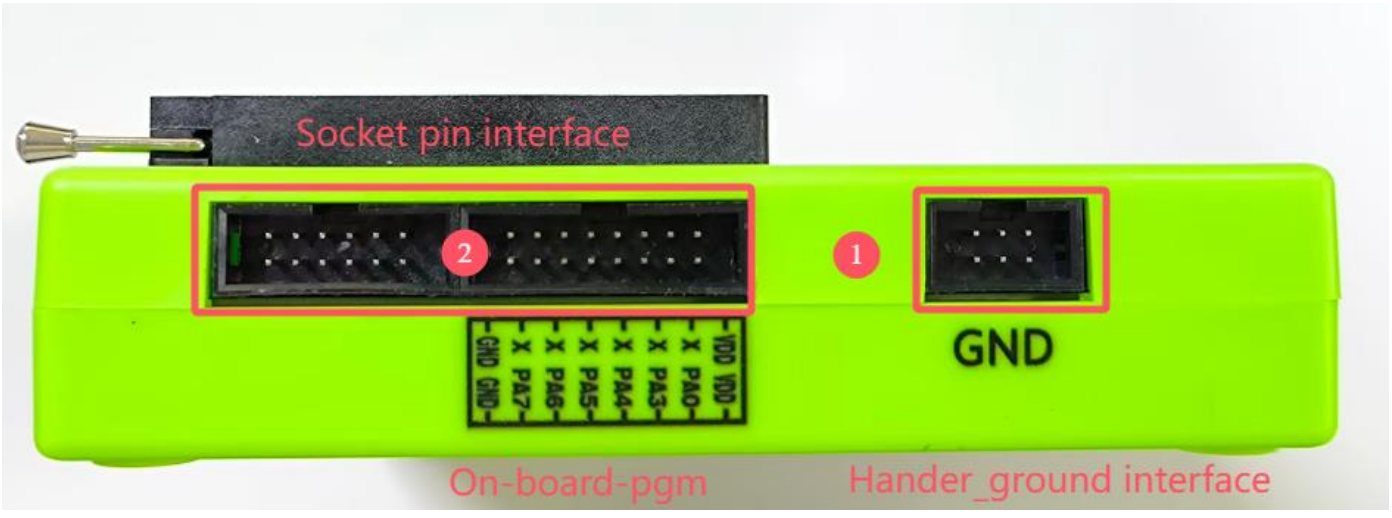
(2) Power supply interface: Use only the dedicated power adapter supplied with the programmer accessories (other adapters must not be used to prevent damage to the Writer).

(3) Micro-USB interface: Connects to a PC.

(4) Expansion interface: Enables communication with external devices.

(5) Handler: Semi-automatic programming interface.

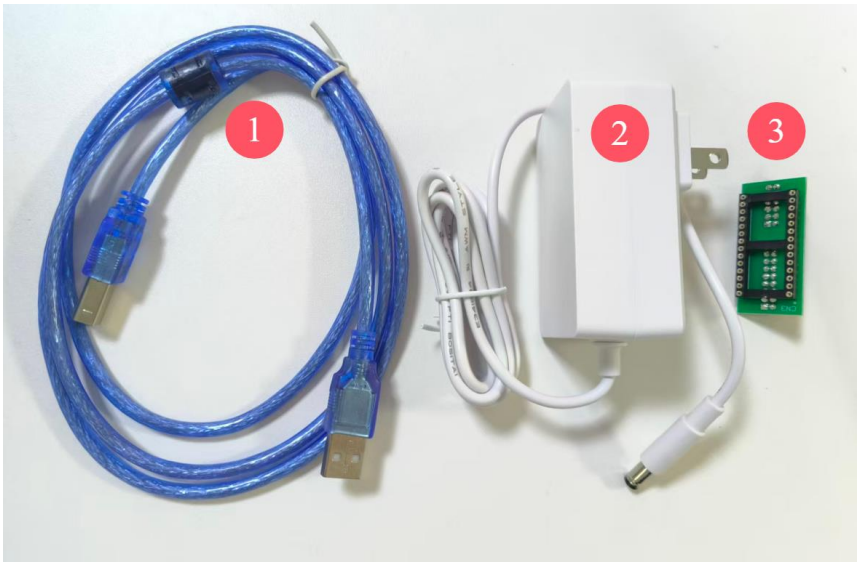
1.3. Right side



(1) GND interface: Common ground interface for semi-automatic programming equipment.

(2) On-board-pgm interface: On-board programming interface and programming socket pin connection port.

1.4. Accessories of Writer



(1) Micro-USB connection cable

(2) Power converter: DC15V

(3) On-board programming adapter board

1.5. Writing application software and User Manual

You can download the latest version of the application software at the following address (including the latest version of the Program Writer)

http://www.padauk.com.tw/en/technical/index.aspx?kind=27

Or enter the home page of www.paduak.com.tw, obtain latest Program Writer version from home page > technology application > technology development tool > Program Writer. Please refer to the chapter 3.

2. Hardware Interface Description：

2.1. DC Power Interface

The DC15V power adapter interface must be used with the original manufacturer-provided power adapter. Using uncertified adapters may affect the stability of the P005 Writer or even damage it

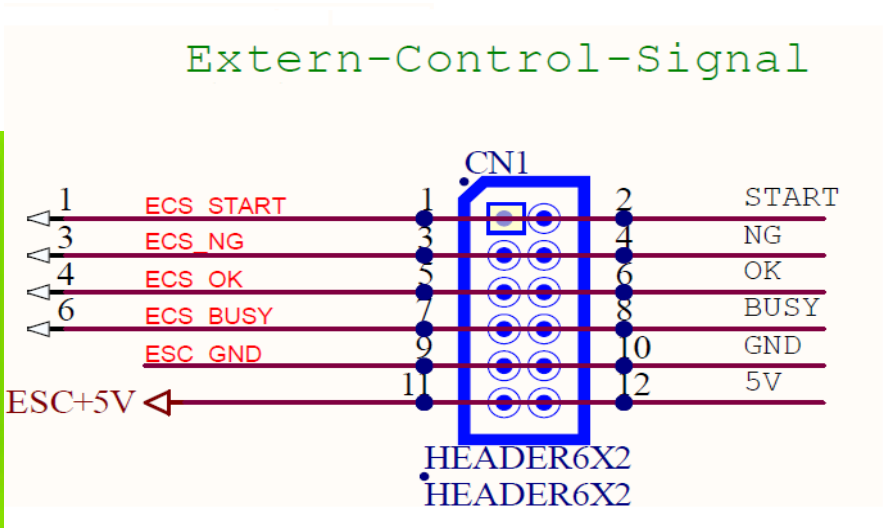
2.2. USB Interface

Connect to a PC using a Micro-USB cable.

2.3. Handler (Semi-Automatic Machine Connection)

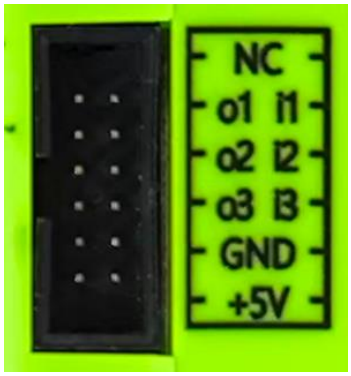
CN1 - Semi-automatic programming interface。

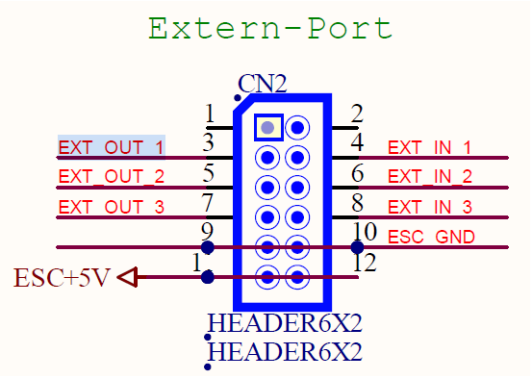
Pin	Name	Attribute	Description
11,12	5V		Power D+5V
9,10	GND		Ground
7,8	BUSY	OUTPUT / High Active	Notify the semi-automatic machine that the Writer is currently programming the IC.
5,6	OK	OUTPUT / High Active	Notify the semi-automatic machine that the IC has been successfully programmed.
3,4	NG	OUTPUT / High Active	Notify the semi-automatic machine: IC programming failed.
1,2	START PROGRAM	INPUT / Low Active Active time >200ms	Trigger signal from the machine to start programming

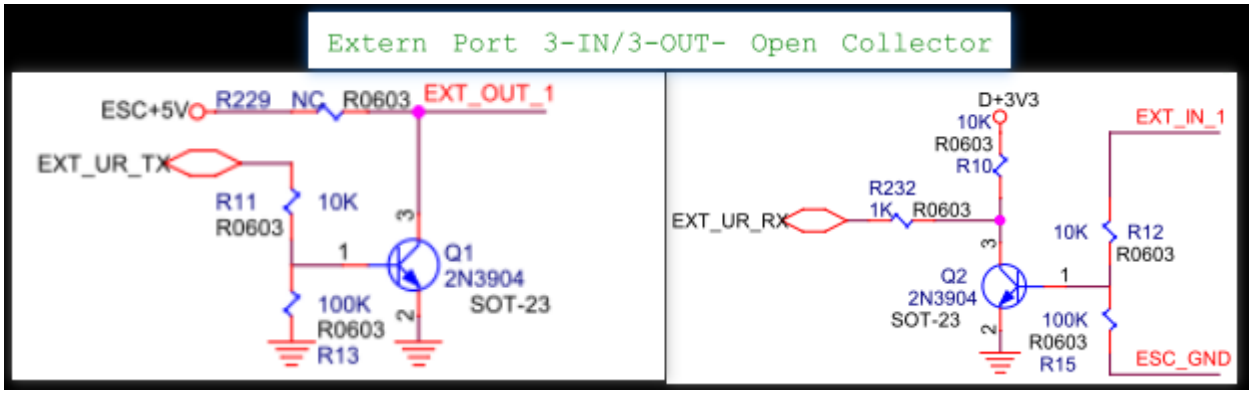


2.4. Extended Interface Description

The P005 Writer reserves a special extended interface for communication and control with the P005 main controller. It has 3 input pins (i1~i3) and 3 output pins (o1~o3).

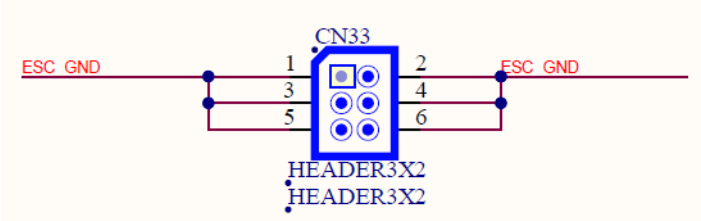






2.5. GND Interface Description

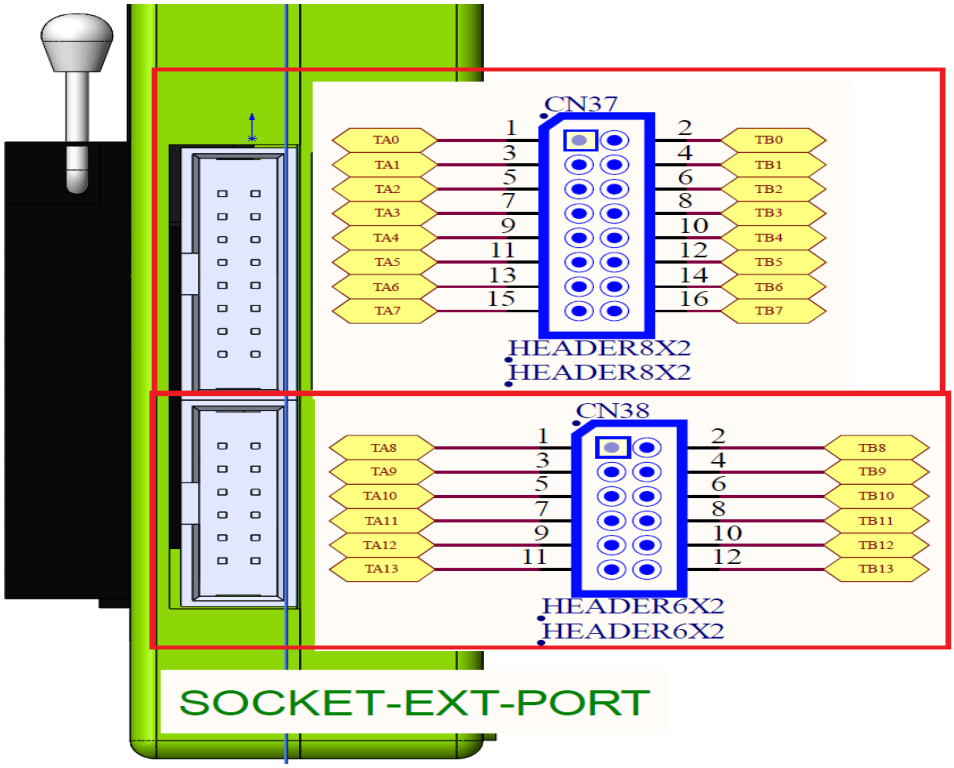
The P005 Writer reserves 6 pins for common ground connection between the writer and semi-automatic machine equipment. When connecting to the user's semi-automatic equipment, simply lead the ground wire from here and connect it to the machine's ground.



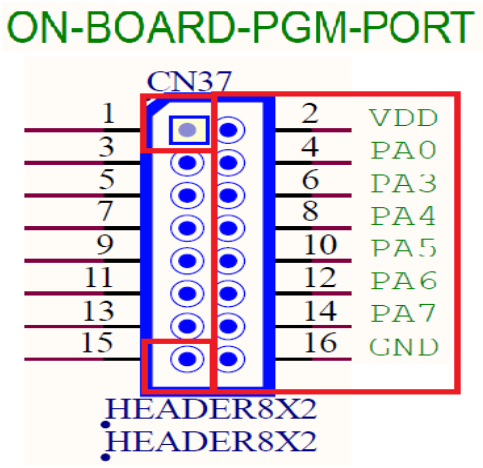
2.6. On-board-pgm Interface

The right-side interface has two functions: programmer socket pin interface and on-board programming pin interface.

The programmer socket pin interface is as follows:

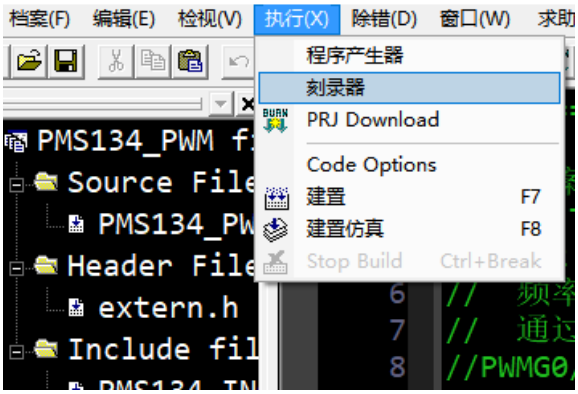


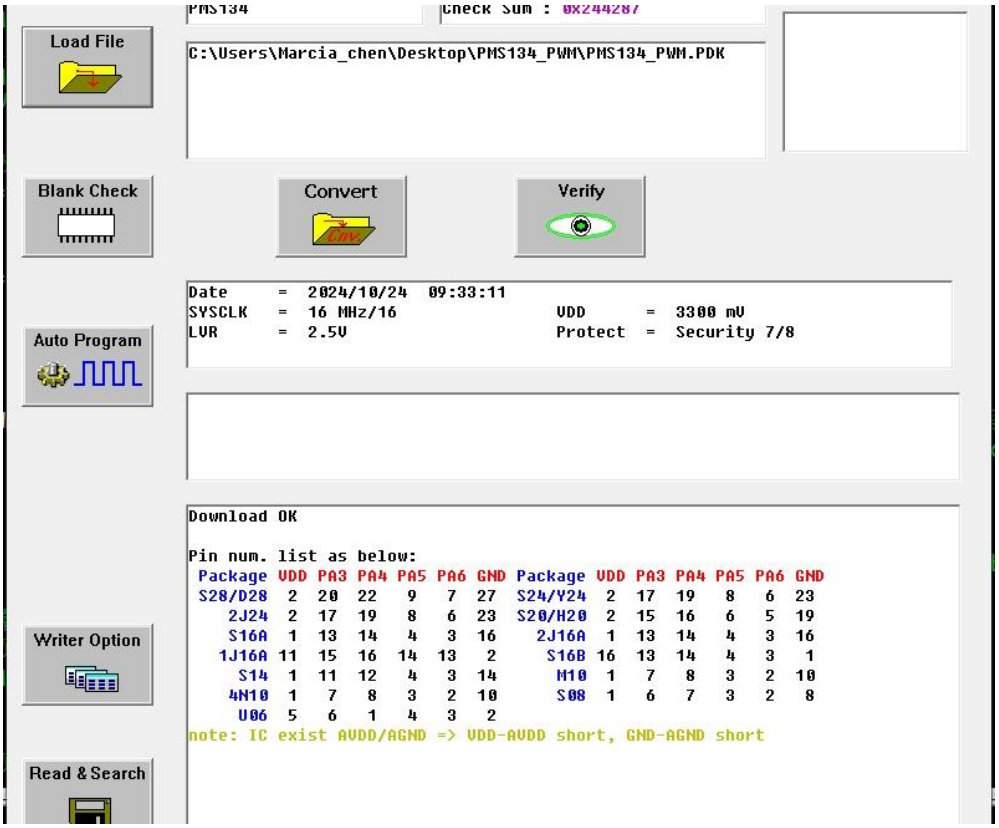
The on-board programming pin interface:



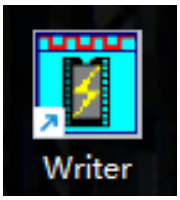
3. Functional Description

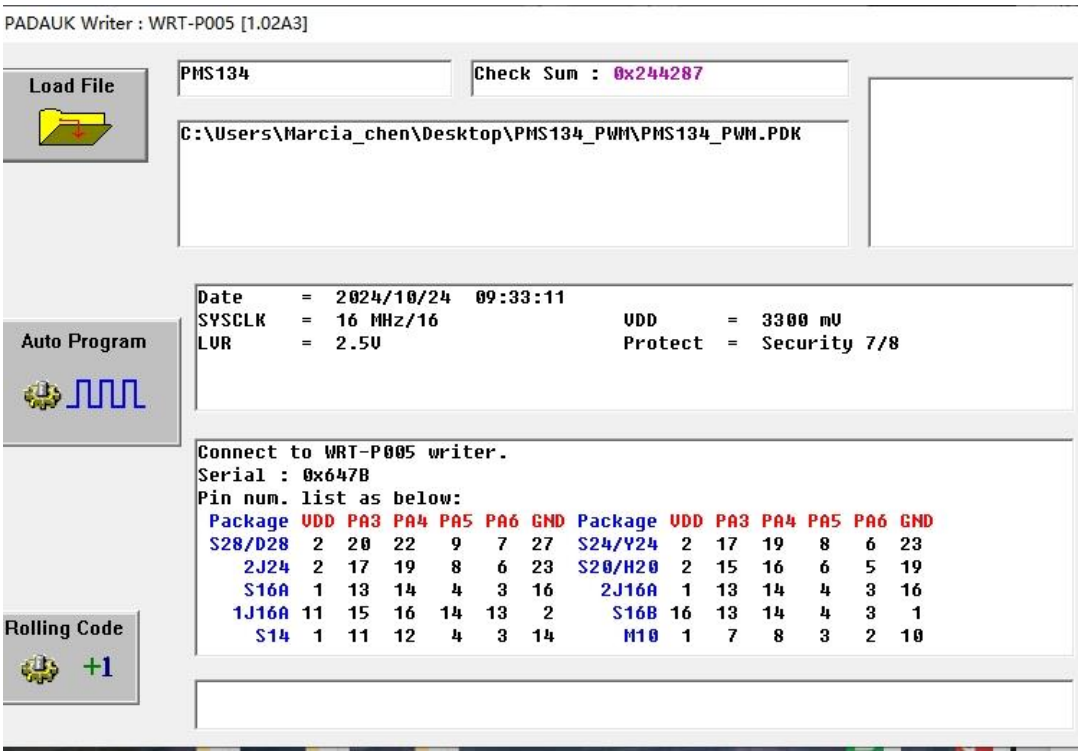
(A) Engineering type





(B) Simple type



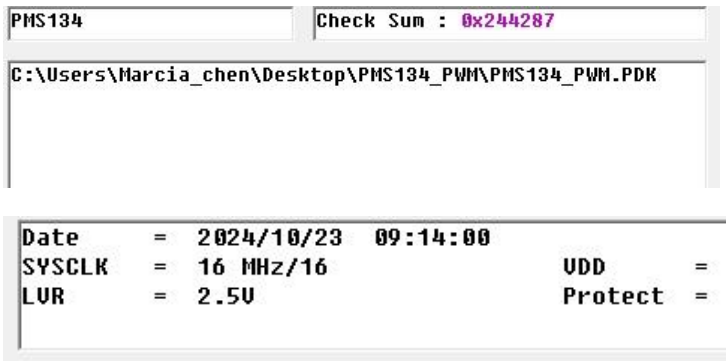


No matter simple type or engineering type, they have the equal corresponding function.

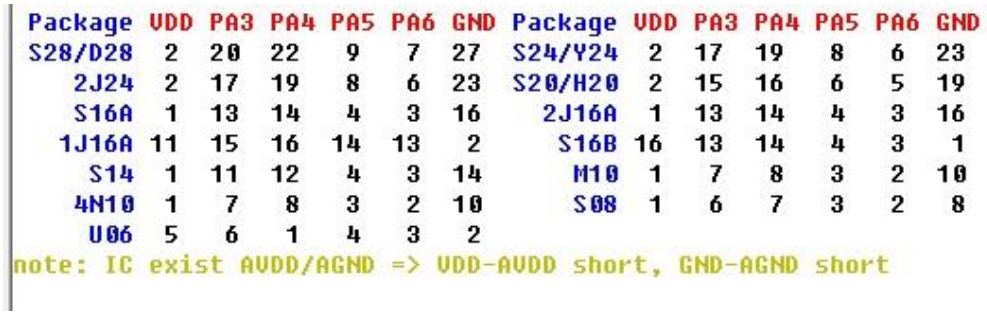
3.1. Steps of loading File

(1) Load PDK file from PC to Program Writer.

(2) Related information of PDK file would be displayed after loading successfully. (i.e. Check Sum, file name …)



(3) After loading successfully, the JUMPER position and IC placement would be prompted.



(4) The LCM also displays the messages and prompts synchronously.

(5) Users could also unplug the USB cable and write in alone mode after the file loaded successfully.

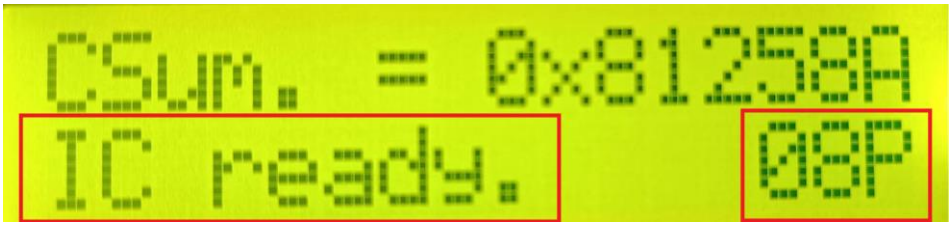
(6) Users should make sure that JUMPER & IC had been put in the correct position before starting “ **Blank Check**” , “**Verify”,** “**Read & Search”** and “**Auto Program”** actions.

(7) When JUMPER & IC have been placed, the Program Writer’s LCM displays **ready”**.

3.2. IC Package Scan / Setting

Check and confirm the package IO pins of the IC to be programmed on the P005 .
a. "IC Ready" appears for the first time after re-downloading the PDK via USB connection to the PC.
b. "IC Ready" appears for the first time after the P005 power is restarted.
c. The downloaded PDK file comes with its own package pin settings.

If the downloaded PDK file does not come with its own package pin settings, the P005 Writer will automatically perform a package pin check and confirmation after power-on or file download. The LCD screen will display "IC Ready xxP", at which point the package pins of the IC to be operated are confirmed. As shown in the figure below.



As shown in the figure above, the package pin detection is 8-pin. This information screen will only be displayed upon the first IC Ready.

3.3. Blank Check

Check whether the IC content is blank or not.

3.4. Verify

Check whether the IC and the .PDK file have the same content.

3.5. Auto Program

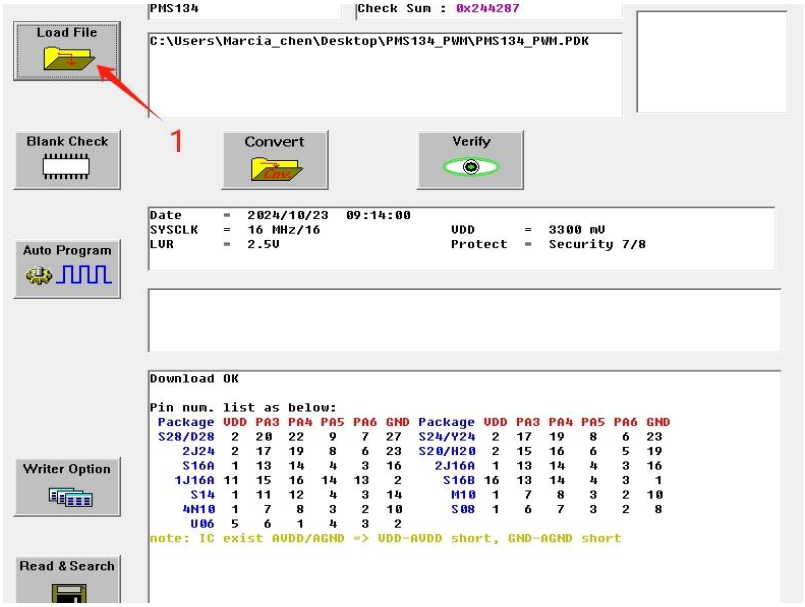
Start writing automatically.

- It is equal to press the Program Writer's PROGRAM button.
- The actions include: Programmable check → Program → Verify → Protect and so on.
- When write successfully, the Program Writer displays " <<< IC O.K. >>> " on the LCM.
- Examples of writing

Take the follow PDK file and IC for examples.

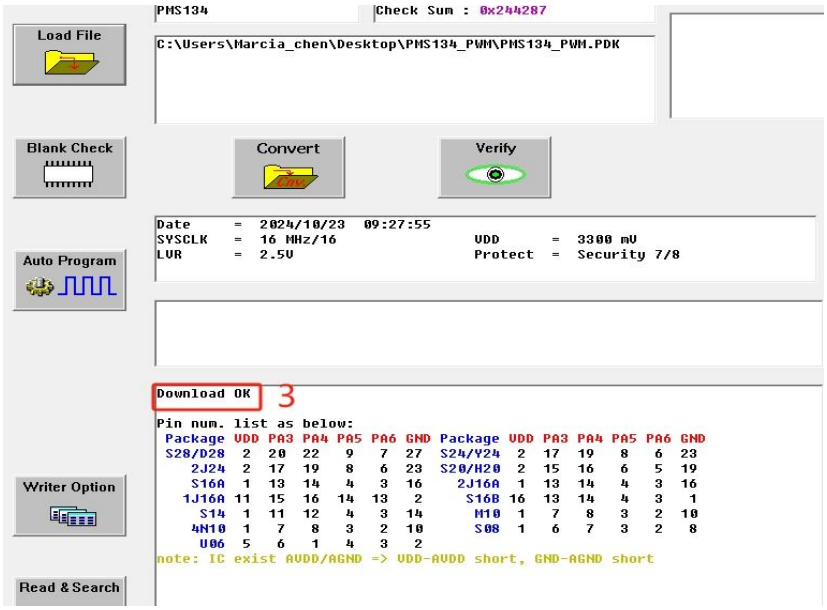
FILE	IC	IDE	Writer	Note
PMS134_PWM.PDK	PMS134-S08	1.02A3	P005	

(1) Click on “Load File”.



(2) Select PMS134_PWM.PDK and click on “ 打开 ”。

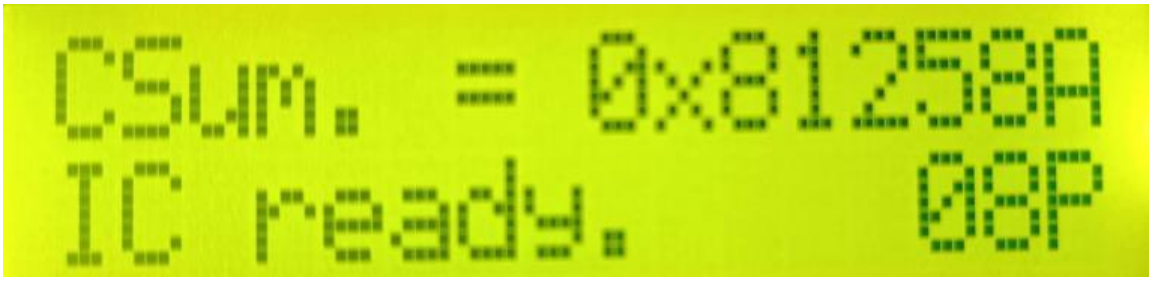
(3) Confirm Download OK (notice the message)



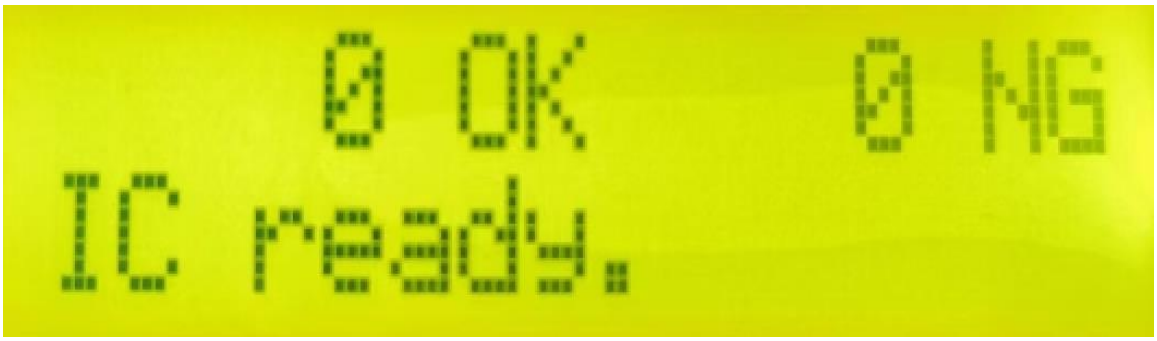
(4) Place the chip to be programmed into the programmer socket. If the PDK file has no special package settings, align pin 1 of the IC with the first pin at the top left of the programmer socket. When the message "IC ready" appears on the LCD screen, it indicates that the P005 has automatically detected and set the package pins of the chip to be programmed.

(5) Confirm the message on the programmer's LCM.

First display with package information:



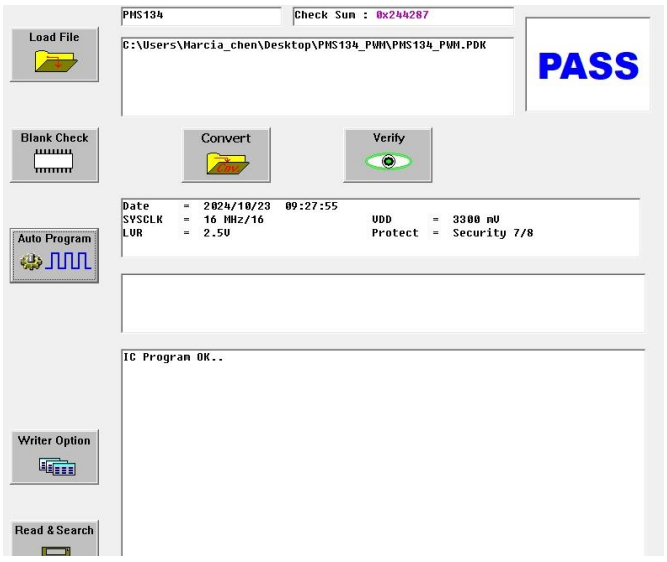
Display without package information:



(6) Click on “ Auto Program ” to start writing.

(7) Make sure the writing result is “ PASS ”

(8) Make sure the information “ <<< IC O.K. >>> ” displayed on LCM.

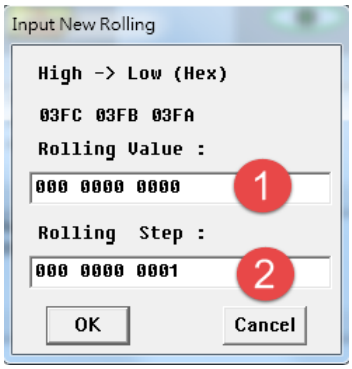


3.6. Rolling Code

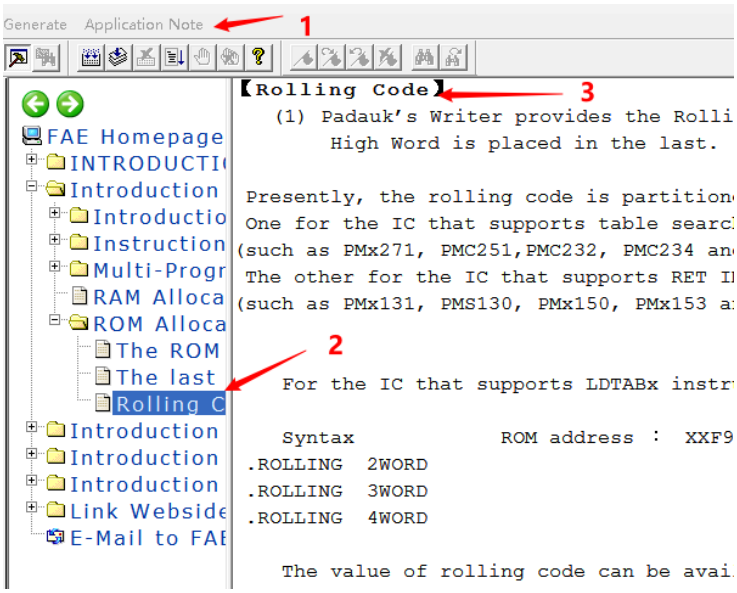
Start the relevant settings about Rolling Code, settings include:

(1) Initial value.

(2) Incremental value.



- This function only valid while the Rolling Code grammar has been set in the loading PDK file
- Please refer to the IDE User Manual to learn about the ways of setting Rolling Code.



(1) Click on " Application Note "

(2) Click on " IC introduction " → " ROM distribution " → " Roll_Code ".

(3) Look up the ways of Rolling Code.

3.7. Read & Search

Search for PC's PDK file which has the same CHECK-SUM.

3.8. Convert PDK

(1) Confirm the PDK file is the one need to convert.

(2) Start converting PDK file.

4. Version Update

You can download the latest version of the application software and Manual (including the latest version of the Program Writer) at the following address:

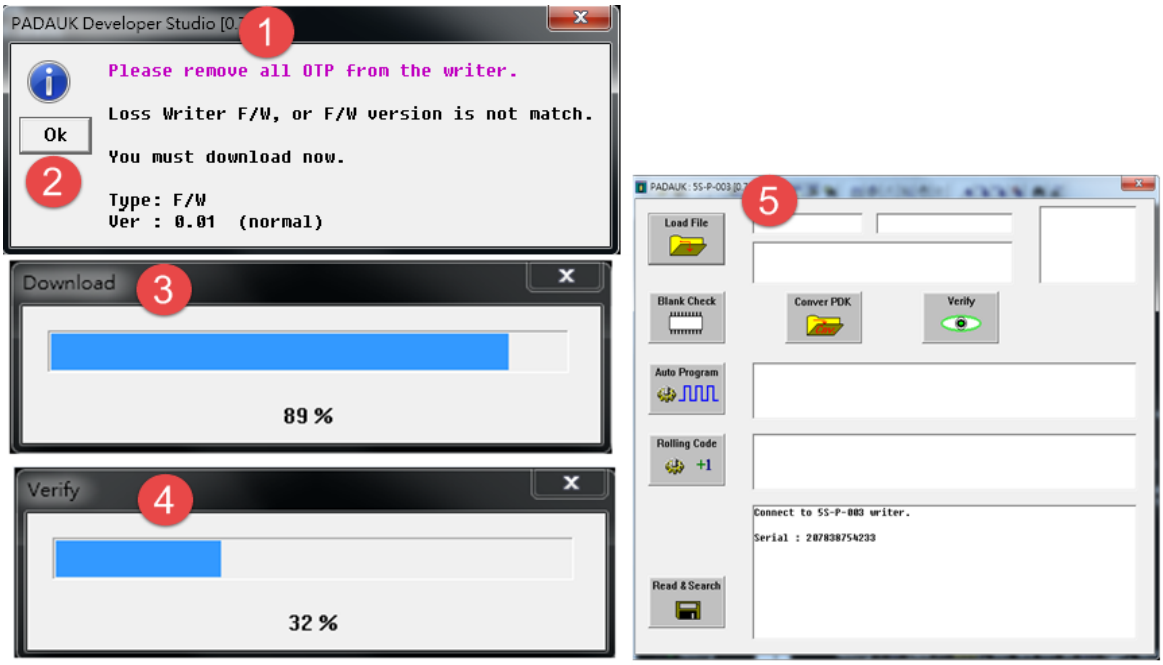
http://www.padauk.com.tw/en/technical/index.aspx?kind=27

Or by www.paduak.com.tw website home page > technology application > technology development tool > Program Writer obtains.

After download the application software, you can install it. Then, you should make sure the Program Writer is connected to PC when update its version. Besides, the Program Writer will update automatically at the first execution.

4.1. Automatic update

While execute the application software, the auto-updating application software including the Program Writer version.



(1) The prompting of Program Writer version update

(2) Click on " OK " to start updating

(3) Download the new version in Writer.

(4) Verify the new version.

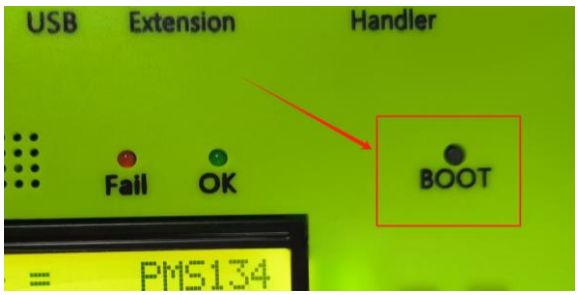
(5) Connect to PC automatically after finish

NOTICE: Please update manually if there is no auto- update when the first time to execute the application software.

4.2. Manual update

Manual mandatory updates are recommended when **service call** occur for P005 LCDM.

(1) Power off the device, then press and hold the Force Update Mode (BOOT) button on the front of the writer and keep it held.



(2) Turn on the power supply, release the SW3 key, enter the Boot loader mode, FAIL light and OK light on at the same time, the LCM displays the following information:

(3) Execute the writing application software and force the update of the writer version contained in the application software. Click OK and the software will automatically Download and Verify.

5. User-defined dedicated package pin information

The user can manually set the package information of the programming file. If the PDK programming file contains package information, the P005 writer will follow the package information in the file and will not perform automatic detection and configuration. There are 2 methods to manually set the package information of the programming file:

(1) Define the package pin information in the program.

(2) Add the package pin information to the PDK file.

5.1. Define the data of exclusive use packaged pin

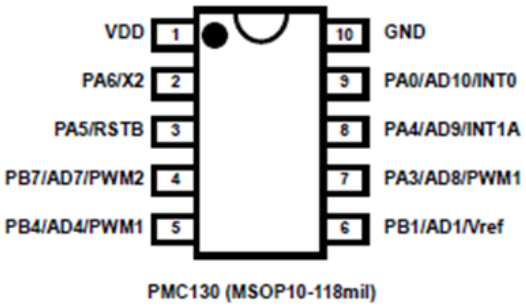
Define the data of exclusive use packaged pin in program. Here is grammar:
or example: **.writer package** 16, 5, 11, 9, 10, 8, 7, 6, 14, 0, 0, 0x00F0, 0x00F4, 0x00, 0x00
Grammar instruction:

Group Count	Name	Introduction	Remarks
1	Pin Count	(the number of pin)	Up to 28 pins
2	VDD	VDD pin number	
3	PA0	PA0 pin number	Note 1
4	PA3	PA3 pin number	
5	PA4	PA4 pin number	
6	PA5	PA5pin number	
7	PA6	PA6 pin number	
8	PA7	PA7 pin number	Note 1
9	GND	GND pin number	
10	AVDD	Analog VDD pin number	Note 1
11	AGND	Analog GND pin number	Note 1
12	Mask1	Package the left pin mask value, each bit represents a pin BIT0→1st pin, BIT2→2nd pin, BITn (n=0..13) 0/1: bypass/ O/S test Set 0:this pin not do O/S test Set 1:this pin do O/S test	Note 2
13	Mask2	Package the right pin mask value, each bit represents a pin; BIT0→m pin, BIT2→ (m-1)pin, BITn (n=0..13) 0/1: bypass/ O/S test Set 0:this pin not do O/S test Set 1:this pin do O/S test	m: The number of pin Note 2
14	Shift	IC is corresponding to the blank space number need to shift from the top of SOCKET. (low nibble only)	Shfit: low nibble
15	Option	Option Description	Bit2：OB enable. Write on board Bit4：VDD/VPP swap (Not supported on P005) Bit5: OBP enable. Write on board power is supplied by the target board Others：Reserved

Note 1: If the pin does not exist or is non-program pin, fill in 0 representing NC (no connect) or non-program pin
Note 2: If the pin does not exist or cannot do O/S test (i.e. Special multi-chip package pin), set the corresponding bit value to zero.

5.2. Case 1

Take PMx131 MSOP-10 for example:



PMC130 (MSOP10-118mil)

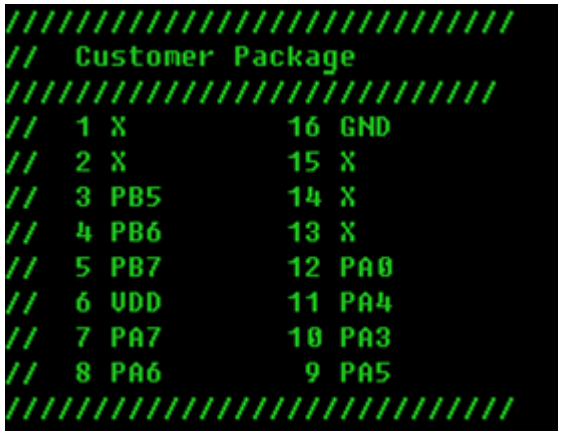
(1). Define the dedicated package pin information in the program as follows:

.writer package 10, 1, 9, 7, 8, 3, 2, 0, 10, 0, 0, 0x005F, 0x005F, 0x00, 0x00

Group count	Name	Description	Value	Remarks
1	Pin Count	The number of package pin	**10**	
2	VDD	VDD pin serial number	**1**	
3	PA0	PA0 pin serial number	**9**	
4	PA3	PA3pin serial number	**7**	
5	PA4	PA4pin serial number	**8**	
6	PA5	PA5pin serial number	**3**	
7	PA6	PA6 pin serial number	**2**	
8	PA7	PA7 pin serial number	**0**	0 indicates that PA7 is non-program pin
9	GND	Package the left pin mask value	**10**	
10	AVDD	AVDD pin serial number	**0**	0 indicates that AVDD does not exist
11	AGND	AGND pin serial number	**0**	0 indicates that AGND does not exist
12	Mask1	Package the right pin mask value	**0x005F**	All pin should test O/S.
13	Mask2	The blank space IC need to be shifted	**0x005F**	All pin should test O/S.
14	Shift	JP7 & The blank space IC need to be shifted	**0x0**	The first pin of IC aligns the upper left first pin of Socket
15	Option	Package the left pin mask value	**0x00**	Bit2：OB enable. Write on board Bit4：VDD/VPP swap (Not supported on P005) Bit5: OBP enable. Write on board power is supplied by the target board Others：Reserved

5.3. Case 2 (Customized package pin)

Customized package pins are shown in the following picture:




```
  1        2   3   4   5  6   7   8   9   10    11     12     13      14     15
pin_cnt   vdd pa0 pa3 pa4 pa5 pa6 pa7 gnd avdd  agnd   mask1  mask2  x/shift  option
```

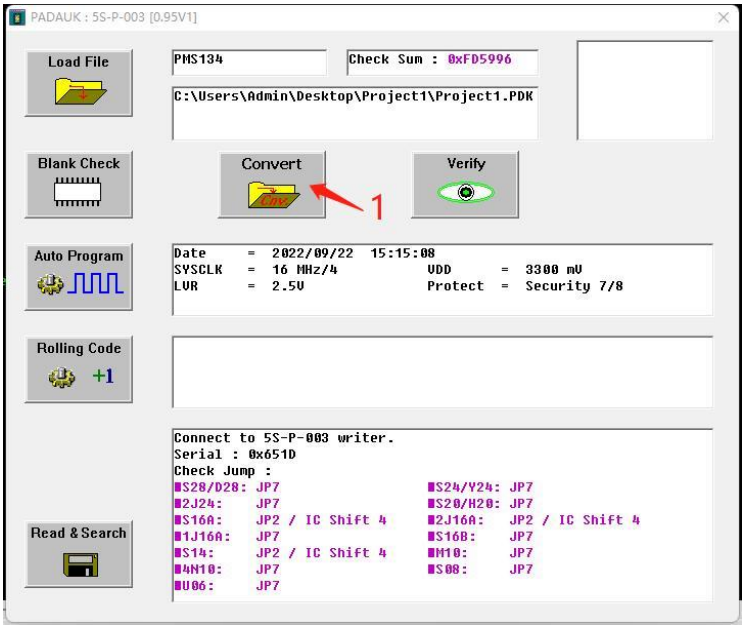
1. You can use the following instruction to define the exclusive package pin:

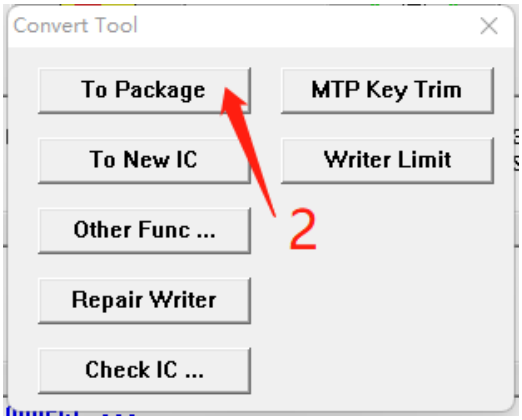
   .writer package 16, 6, 12, 10, 11, 9, 8, 7, 16, 0, 0, 0x00FC, 0x00F1, 0x00, 0x00

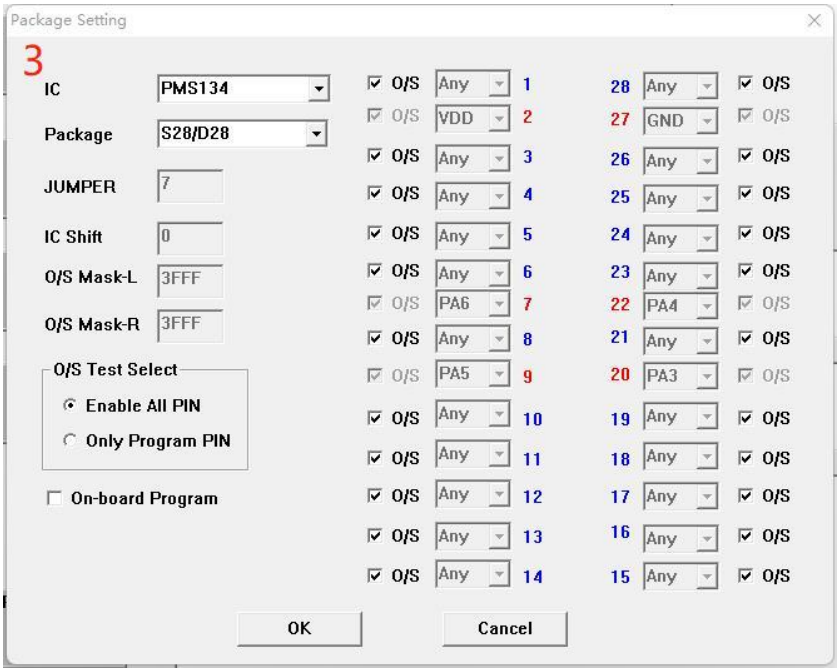
Group Count	Name	Description	Value	Remark
1	Pin Count	the number of pin	**16**	
2	VDD	VDD pin serial number	**6**	
3	PA0	PA0 pin serial number	**12**	
4	PA3	PA3 pin serial number	**10**	
5	PA4	PA4 pin serial number	**11**	
6	PA5	PA5 pin serial number	**9**	
7	PA6	PA6 serial number	**8**	
8	PA7	PA7 pin serial number	**7**	
9	GND	GND pin serial number	**16**	
10	AVDD	AVDD pin serial number	**0**	0 indicates that AVDD does not exist
11	AGND	AGND pin serial number	**0**	0 indicates that AGND does not exist
12	Mask1	Package the left pin mask value	**0x00FC**	Bypass pin 1, 2.
13	Mask2	Package the right pin mask value	**0x00F1**	Bypass pin 15, 14, 13
14	Shift	JP7 & The blank space IC need to be shifted	**0x0**	Using JP7 and The first pin of IC aligns the upper left first pin of Socket
15	Option	Option Description	**0x00**	Bit2：OB enable (Write on boardenable) Bit4：VDD/VPP swap (Not supported on P005) Bit5: OBP enable. Write on board power is supplied by the target board Others：Reserved

5.4. The way to add package pin information to PDK file

For the developed PDK file, the way to add package pin information as follows:

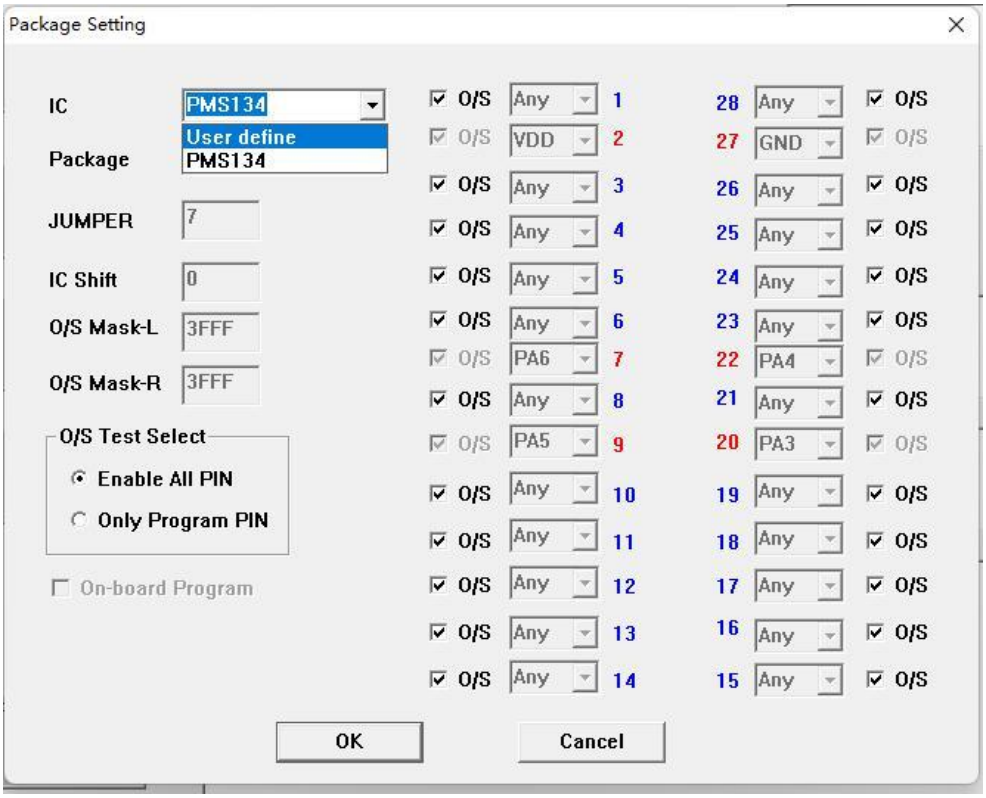


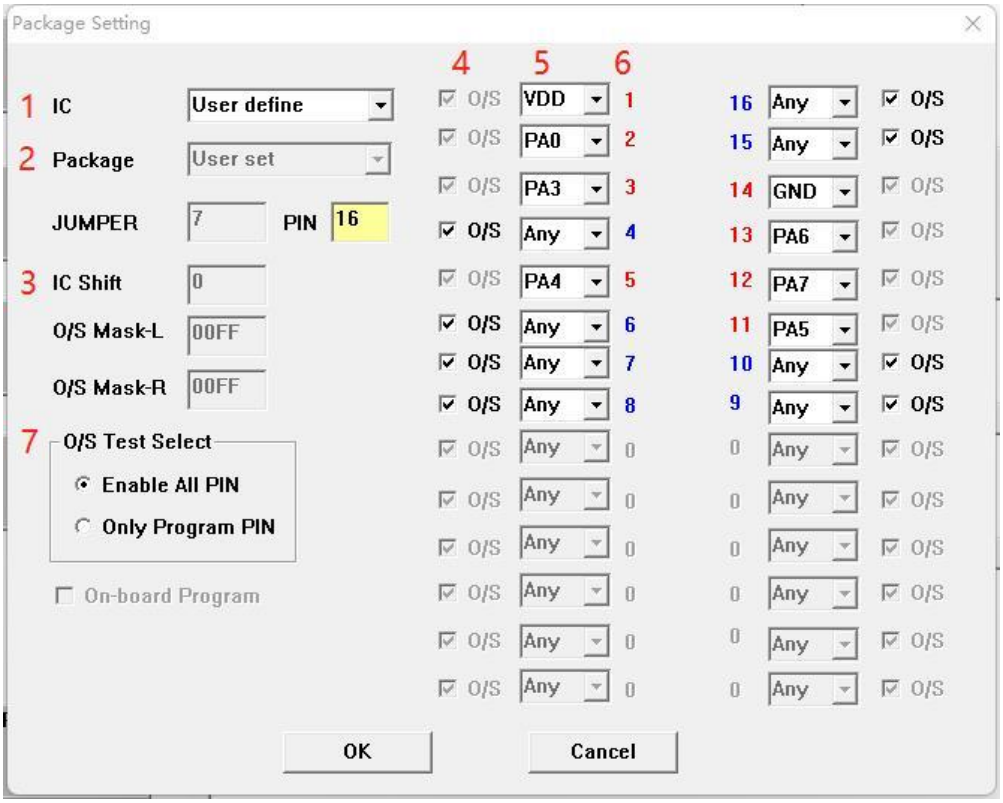




(1) Click on “ Convert PDK ” .
(2) Choose “ To Package ”
(3) Insert the information of package pin, please refer to section "Defining Dedicated Package Pin Information".
(4) Click on “ OK ” .
(5) Confirm again.
(6) Save as a new file.

5.5. The description of package setting details





(1) IC Type: Specify the supported IC type.

(2) Package: Set PIN Count. Only when the IC type is 'User define', users could set PIN Count freely via PIN, the input range is 6~28.

(3) IC Shift: Set the space needed shift when you place IC in socket; Input range is 0 ~10, default value is 0.

(4) O/S check: Check the pin whether need O/S test or not, tick the pin that need Open/Short test.

(5) Settings of writing pin: Set writing pin , non-writing pin choose『Any』. All writing pin must be specified.

(6) Pin number: Automatic change by the pin count.

(Writing pins are represented by red; pins which are not been written are represented by blue; others are represented by gray.)

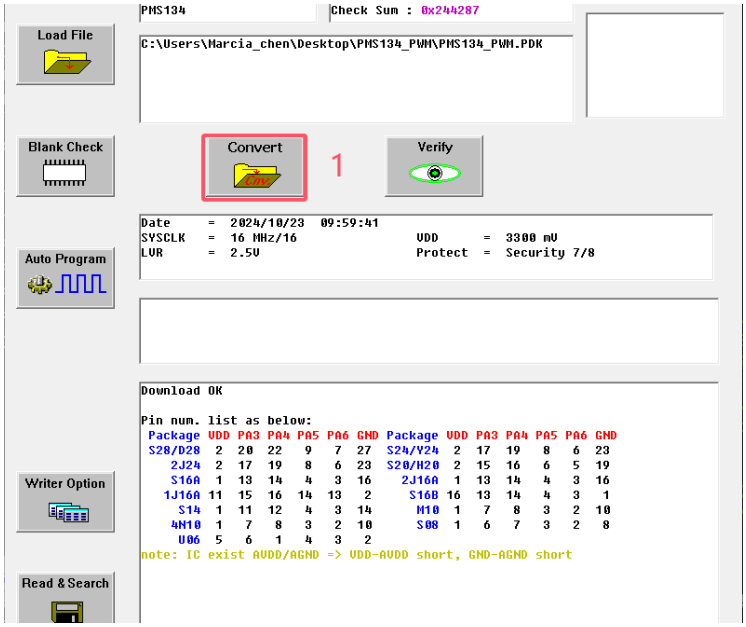
(7) O/S Test Select：Select the pin need to do Open/Short Test.

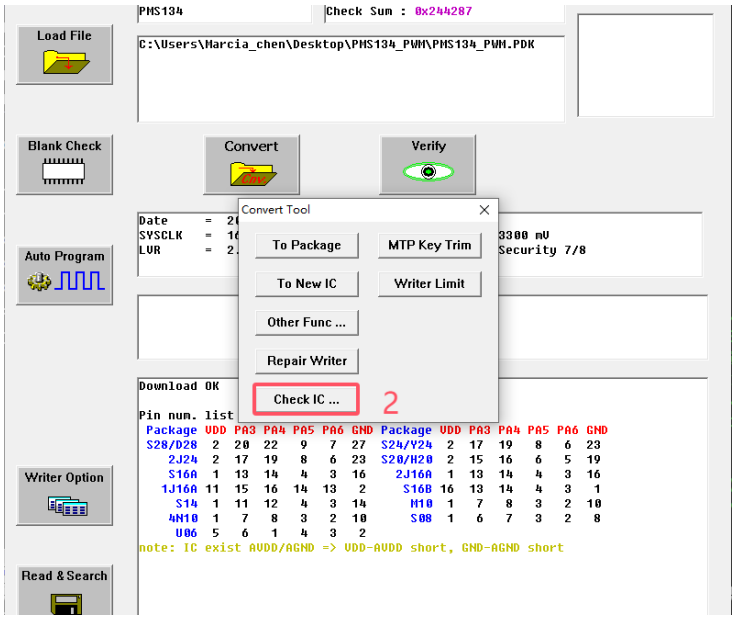
Enable All PIN: Check all pin.

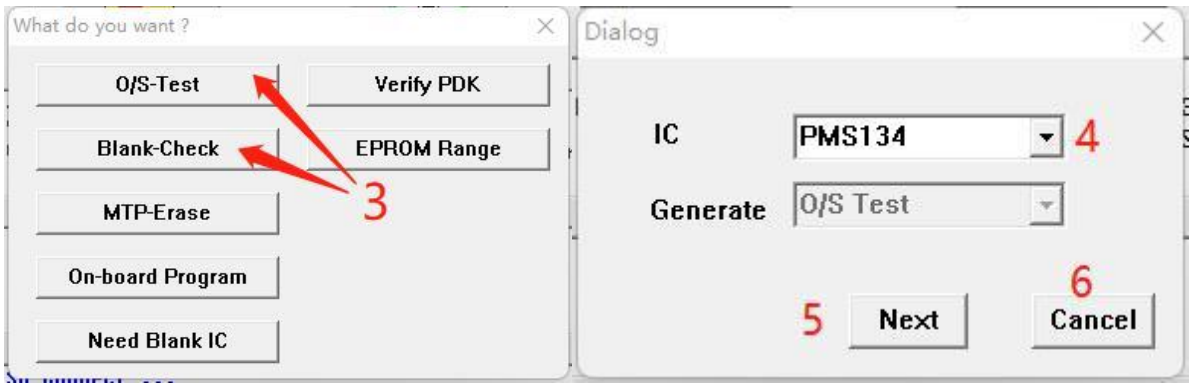
Only Program PIN: Only check writing pin.

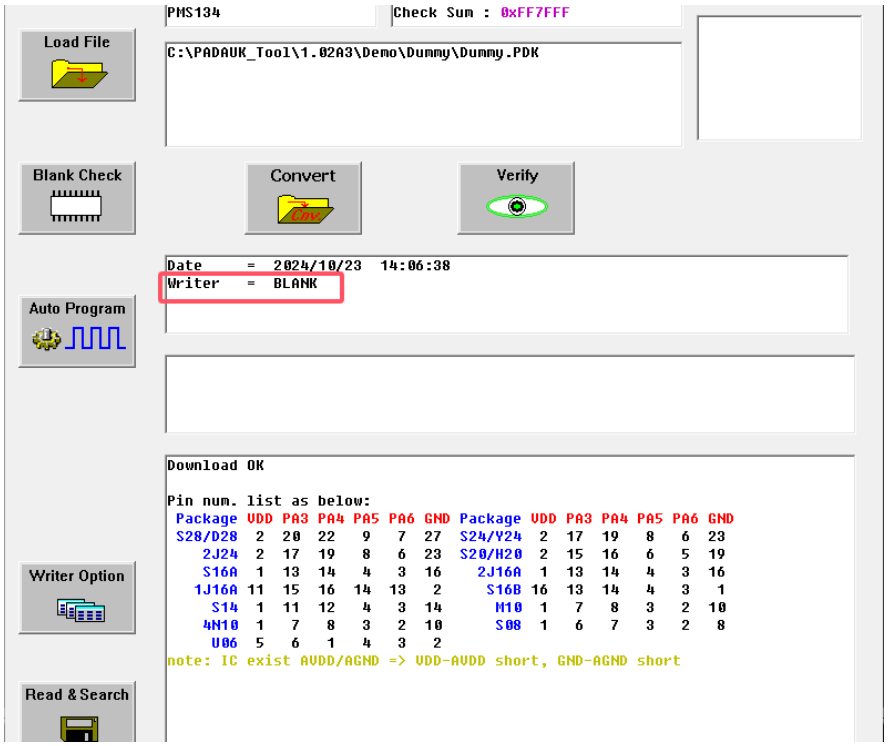
6. Set O/S Test and Blank Check

This chapter explains how to set writer which only do chips' O / S test or blank check. Steps as follows:









(1) Click on “Convert PDK”.

(2) Click on “Check IC”.

(3) Choose “Set O/S-Test” or “Set Blank-Check” to go to the menu.

(4) Choose IC type (i.e. PMS134).

(5) Click on “Next” to go to next step.

(6) Or click on “Cancel”.

(7) Enter package setting. Please refer to section 5.6 to get relative descriptions. Click on “OK” after complete setting.

(8) Automatically download the configuration file to the Writer.

After complete the above steps, users can cooperate with semi-automatic equipment just do chips’ O/S tests or blank checks.

NOTICE: Blank Check including O/S test.

7. Writer LCM Information and Buzzer Sound Table

- Writer LCM information:

LCM information	Descriptions	Exclusions and Solutions
Wait : Load File	.PDK file was not loaded	Load .PDK file after connect to USB
No support…	Writing files is not supported	
remove.	IC has been removed	
IC ready.	IC is prepared	
<<< IC O.K. >>>	Check empty, verify or writing complete	
Insert:JP?	Failed to detect JUMPER	Please recheck JUPMER
IC O/S test fail O/S: P? Open O/S: P? Short O/S: P? Leak O/S: Fail	IC Open/Short test failed	Please replace IC or remove and put it again or check Jumper, connecting board and settings again.
Leak test fail	IO test fail (PMS150G only)	Please replace IC
IC Shift:?	Tips IC placement	
Do Check... Do Erase.. Do Program... Do Verify... Do Adjust IHRC.. Do Protect...	IC is being checked IC is being erased (MTP only) IC is being written IC is being verified IC is being adjusted IC is being protected	
Find a diff. IC.	IC model does not match the writing file	Please replace IC
IC not match.	IC's content does not match	Please replace IC
Over program cnt	Write failed, more than written	Please replace IC
IC Over Current	Writing failed, over current occurred	Please replace IC
Over PGM limit	Exceeded writable limit of writer	Reload the .PDK file
IC not work(xx)	Writing failed, unable to work	Please replace IC
IC Invalid	IC identify failed	Please replace IC
IC Ver mismatch	IC/PDK identify failed	Please replace IC or update IDE
IC Erase fail.	Erase failed	Please replace IC
IC Blank	Blank IC	
IC not blank.	Not blank IC	Please replace IC
IC verify fail.	IC verify fail	Please replace IC
Loss PC Rolling.	Rolling code synchronously failed	USB reconnect, writing software re-execution
lose trim data	Invalid IC correction value	Please replace IC
Loss IC pkg info	Invalid packing definition	Please check the package definition in the source code
Ver not match.	IC version does not match	Please update the latest writer version

LCM information	Descriptions	Exclusions and Solutions
Service Call Hold reboot-SW and Repower on	Writing procedure failure	Press SW3 on the back cover, after power on again, connect IDE software update writer
E00: SYS-PWR NG	Power self-test failed	Please contact FAE
VPP Power fail VDD Power fail	Failed to increase writing voltage	Please replace IC, if this continues to occur, please contact FAE
Board/IDE ver. mismatch(xxx"	Burning self-test failed	Please contact FAE

● **Buzzer sound table：**

Buzzer sound	Introduction	Exclusion and Solutions
1 long beep	Writing failed	Check IC and exclude the possible situation
Continuous short beep (about 6sec)	The IC writing signal has been interrupted abnormally; IC has been removed; IC has been forced out by Semi-automatic Writing Handler	Checking the settings of Semi-automatic Writing Handler writing time
5 consecutive short beeps every 5 seconds	Press and hold the writing button continuously but not release it	Check whether the burning button is stuck

8. Appendix Descriptions

8.1 Special notes of MTP On-board writing

MTP series enable to support On-board writing.

Take PFS154 as an example (please refer to PFS154 data sheet to learn about other MTP chip writing wire)

There are five wires of on-board writing, one clock wire ICPCK and one data wire ICPDA, and three other power wires are VDD, GND and writing voltage VPP. In the follow wiring table of on-board writing, the ☆ of wiring table may be resistor or capacitor, and the conditions of wiring circuit as follows:

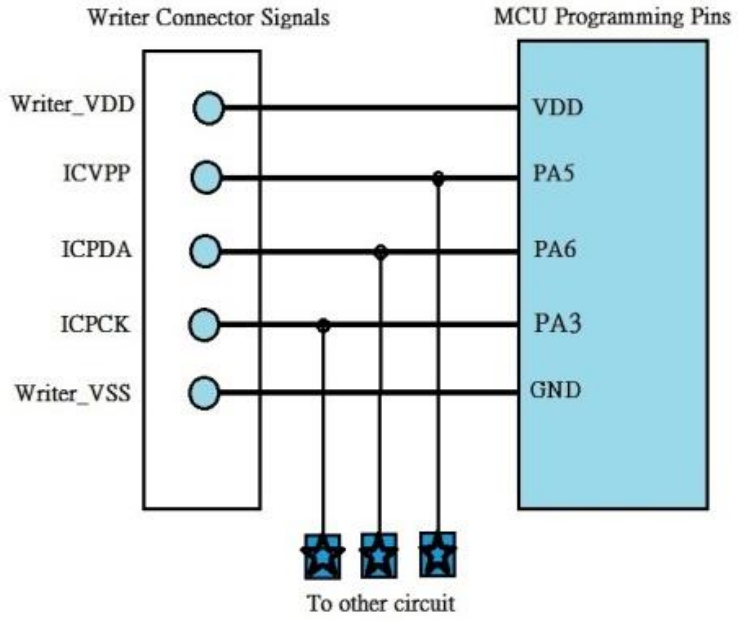
PIN	Resistance	Capacitance
V_{DD} / GND	---	Capacitance must be less than or equal to 0.1 UF
PA3 / PA5 / PA6	Resistance must bigger than or equal to 10KΩ	Capacitance must be less than or equal to 220pF

At the same time, set O/S test to writing pin particularly

Notice:

(1) The voltage is as high as 8V (PA5/VPP) when writing. Please confirm the peripheral parts could withstand the voltage.

(2) VDD cannot be limited to 5.0V or below to 5.0 V. If must connect 5.1V Zener diodes to VDD, please select " On-board Program" on the writer interface

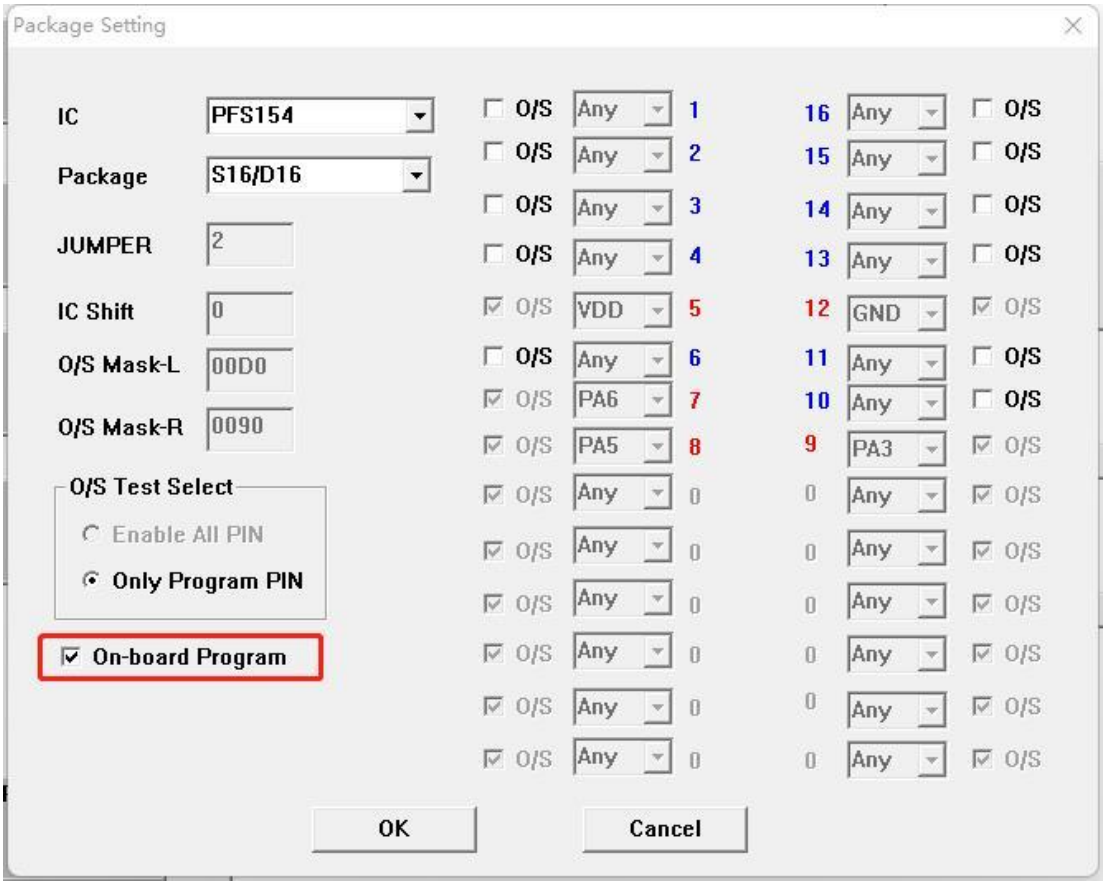


On-board programming, tick the “On-board Program” step.

(1) Click on “**Convert**”.

(2) Click on “**To Package**”.

(3) Input package pin information – Check “**On-board Program**”.



8.2 Special notes of voltage while On-board or Multi-Chip-IC writing (OTP / MTP)

(1) When programming, VPP may be higher than 11V, and VDD maximum supply current is not over 20mA.

(2) VDD may be higher than 7.5V for PDKxx/P2xx series ICs; for other series ICs, VDD may be higher than 6.5V (Each chip will be different, please refer to the specification of the chip used).

(3) The voltage of other program pins (except GND) is the same as VDD.

If you have On-board writing or Multi-Chip (ex: MOS, EEPROM, and 2.4G), be sure to pay attention to above notification.

Please follow the instruction in Section 8.1, especial for MTP voltage limitation.