

# **Holtek MCU In-Circuit Programming Guidelines**

## Document Revised List

Version	Date	Content
1.00	2012/01/01	Initial Version
1.01	2012/08/08	1.Add "ICP/OCD pin share with I/O 、ADC" note 2.Rearrange document layout
1.02	2013/05/17	1.Add 8051 ICP information 2.Update Fig.1
1.03	2013/09/30	1.Update Fig.11 2. Update the diagrams in the "ICP pin definition" section
1.04	2016/6/28	1.ADD "ICP-2L" in the ICP pin definition section
1.05	2018/1/3	1. ADD "ICP-1F" in the ICP pin definition section 2. Delete "ICP-2L" in the ICP pin definition section
1.06	2019/5/22	1.Update Fig.11

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## 1. Overview

This document depicts the HOLTEK MCU ICP pin definition, how to do ICP programming on e-WriterPro & e-Link, and some related notes.

## 2. e-WriterPro ICP (In-Circuit Programming)

### 2.1 Operation

The following steps describe how to do ICP programming on e-WriterPro:

Step. 1 Connect ICP connector on your Target Board to the CN1 pins on e-WriterPro (Please refer to the following chapter “ICP Pin Definition” for the CN1 pins definition)

Step. 2 Execute HOPE3000, and open programming files (.OTP/. MTP/. PND/.HEX) then download it.

Step. 3 During downloading, the below “Select IC Package” windows is shown, and you should select the appropriate ICP package (Please refer to the following chapter 2.2 “e-WriterPro ICP Pin Definition” to select the appropriate ICP package. If no any ICP package is listed on “Select IC Package” window, then you should update HOPE3000 to the newest version).

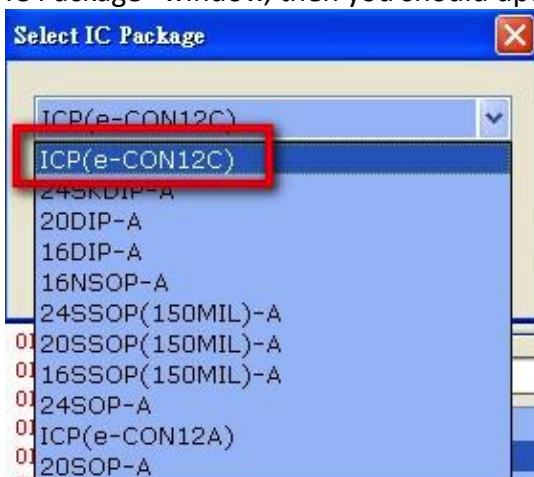


Fig. 1

Step. 4 After the download process is finished, you can do the Erase/Program/Verify...etc.

## 2.2 ICP pin definition

The below table lists all kinds of ICP pin definitions. Then the following two-steps help you to get your one:

- Step1. Get the ICP Type for the MCU you use (inquire by Web)
- Step2. Get the Pin definition of the ICP type from this following table.

ICP Type	ICP Package on HOPE3000	ICP Pin Definition Link
ICP-1A	ICP (e-CON12B)	<a href="#">ICP-1A</a>
ICP-1B	ICP (e-CON12B)	<a href="#">ICP-1B</a>
ICP-1C	ICP (e-CON12B)	<a href="#">ICP-1C</a>
ICP-1D	ICP (e-CON12B)	<a href="#">ICP-1D</a>
ICP-1E	ICP (e-CON12B)	<a href="#">ICP-1E</a>
ICP-1F	ICP (e-CON12B)	<a href="#">ICP-1F</a>
ICP-2A	ICP (e-CON12C)	<a href="#">ICP-2A</a>
ICP-2B	ICP (e-CON12C)	<a href="#">ICP-2B</a>
ICP-2C	ICP (e-CON12C)	<a href="#">ICP-2C</a>

Table. 1

### 1) ICP-1A

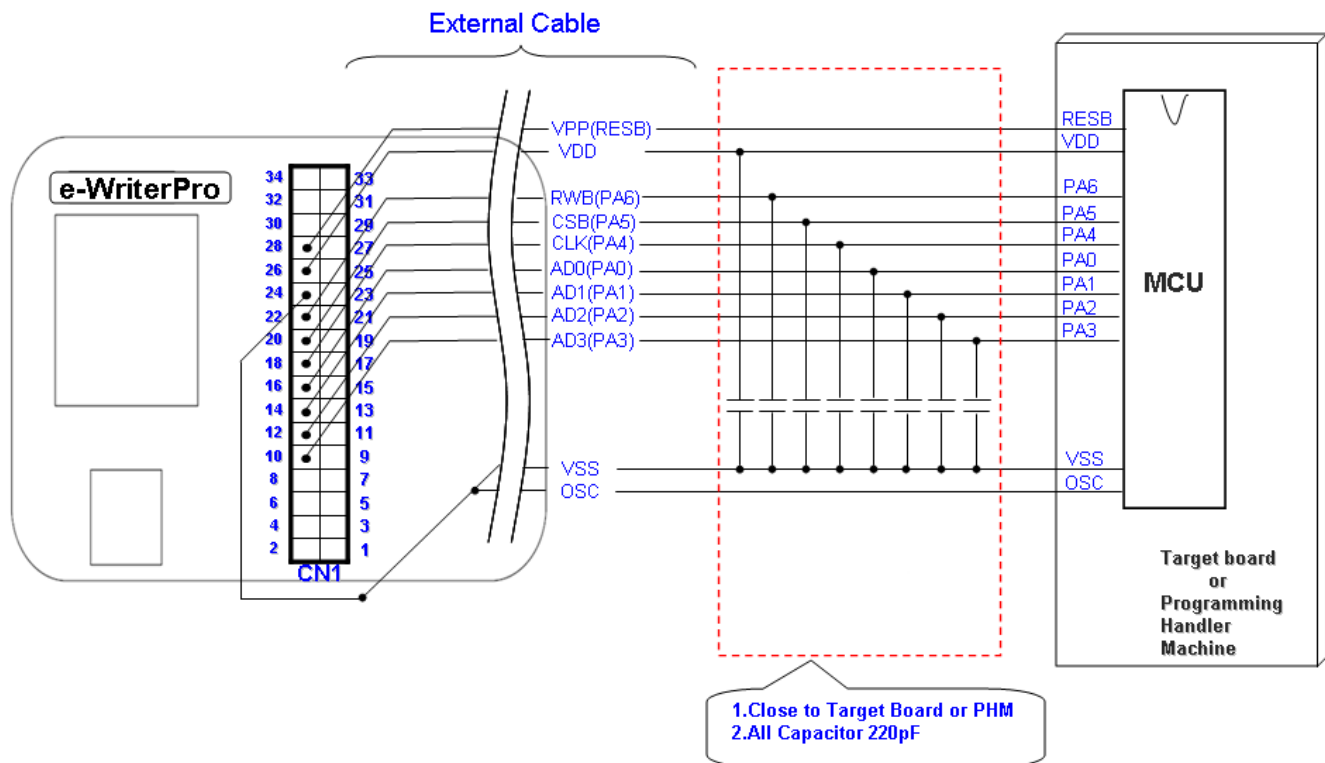


Fig. 2

2) ICP-1B

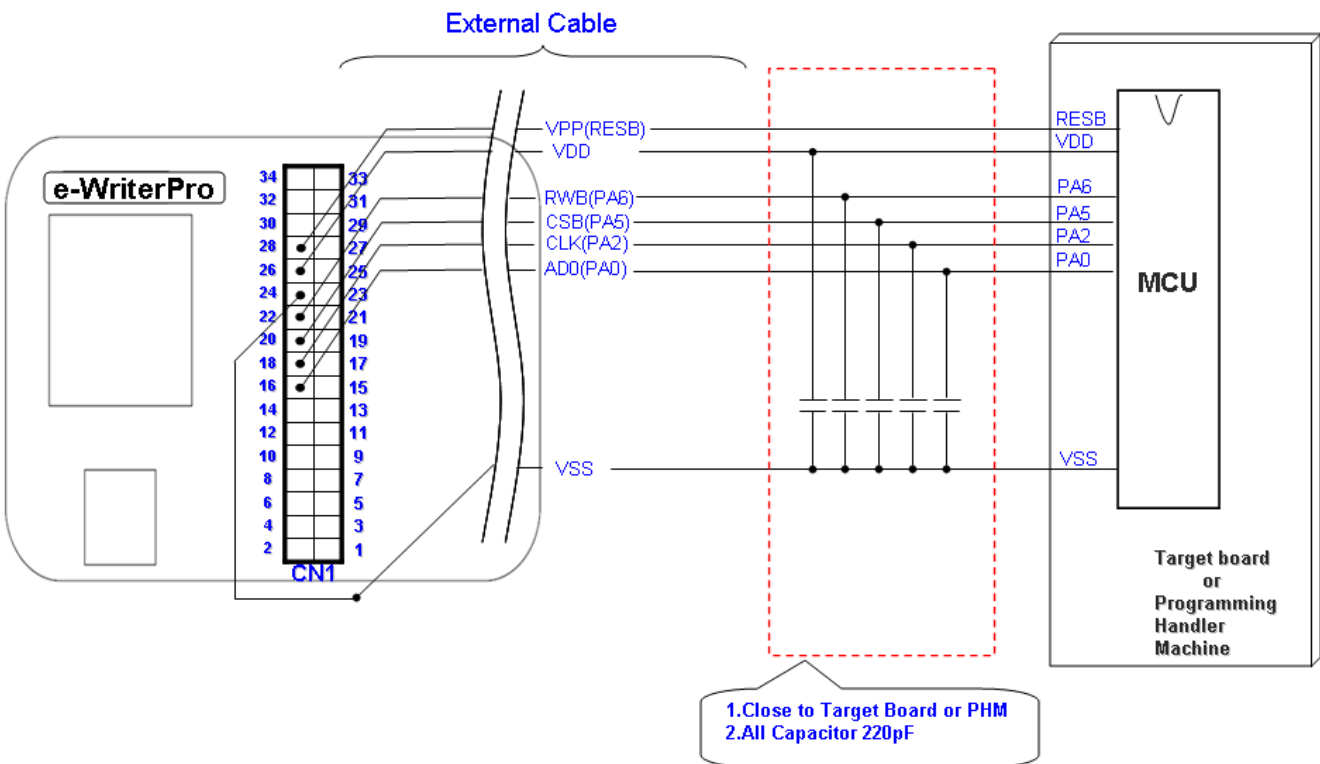


Fig. 3

3) ICP-1C

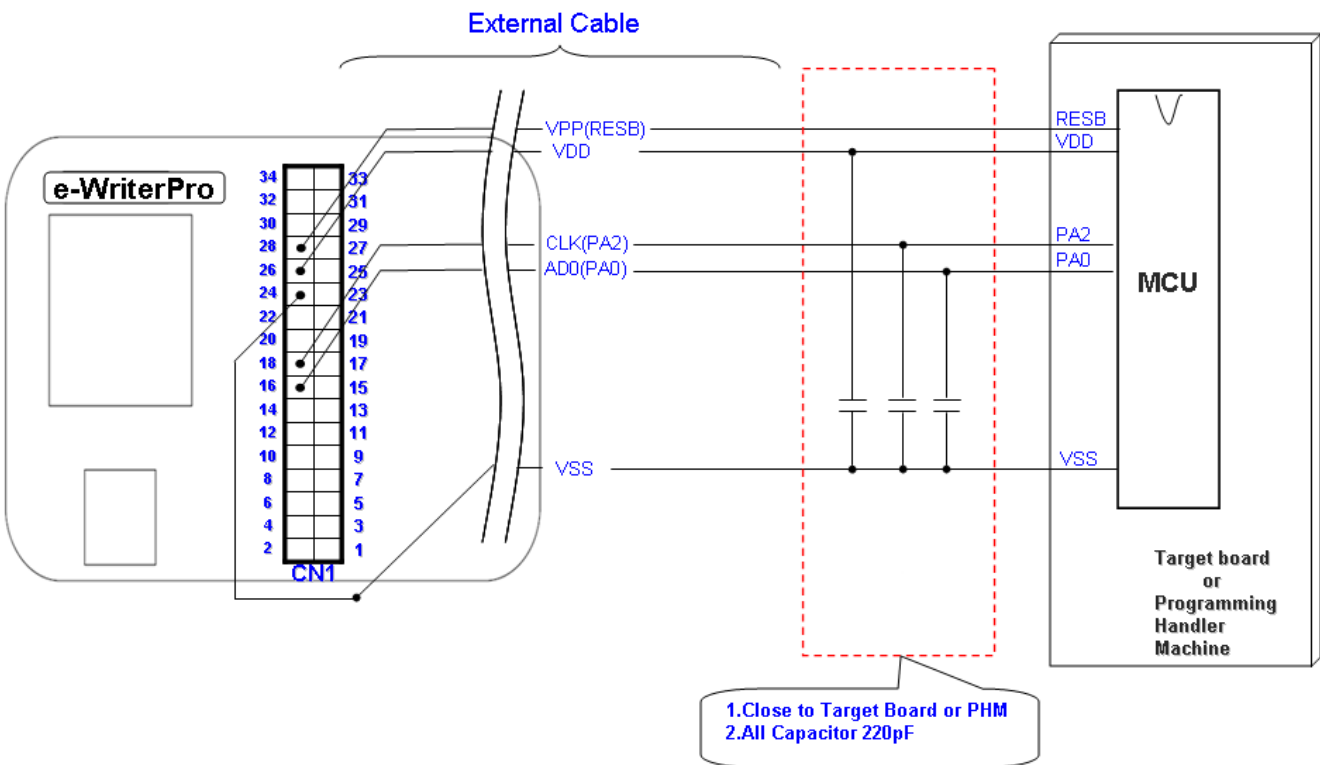


Fig. 4

4) ICP-1D

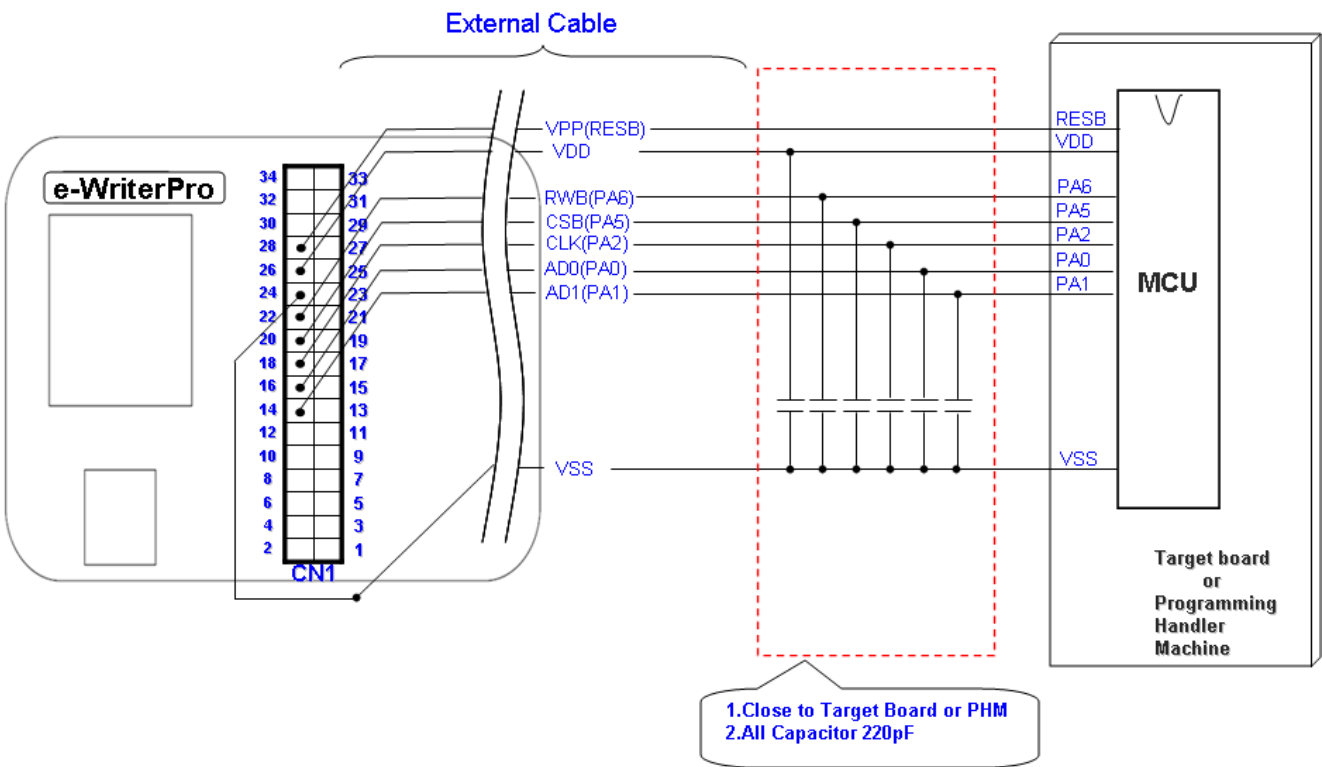


Fig. 5

5) ICP-1E

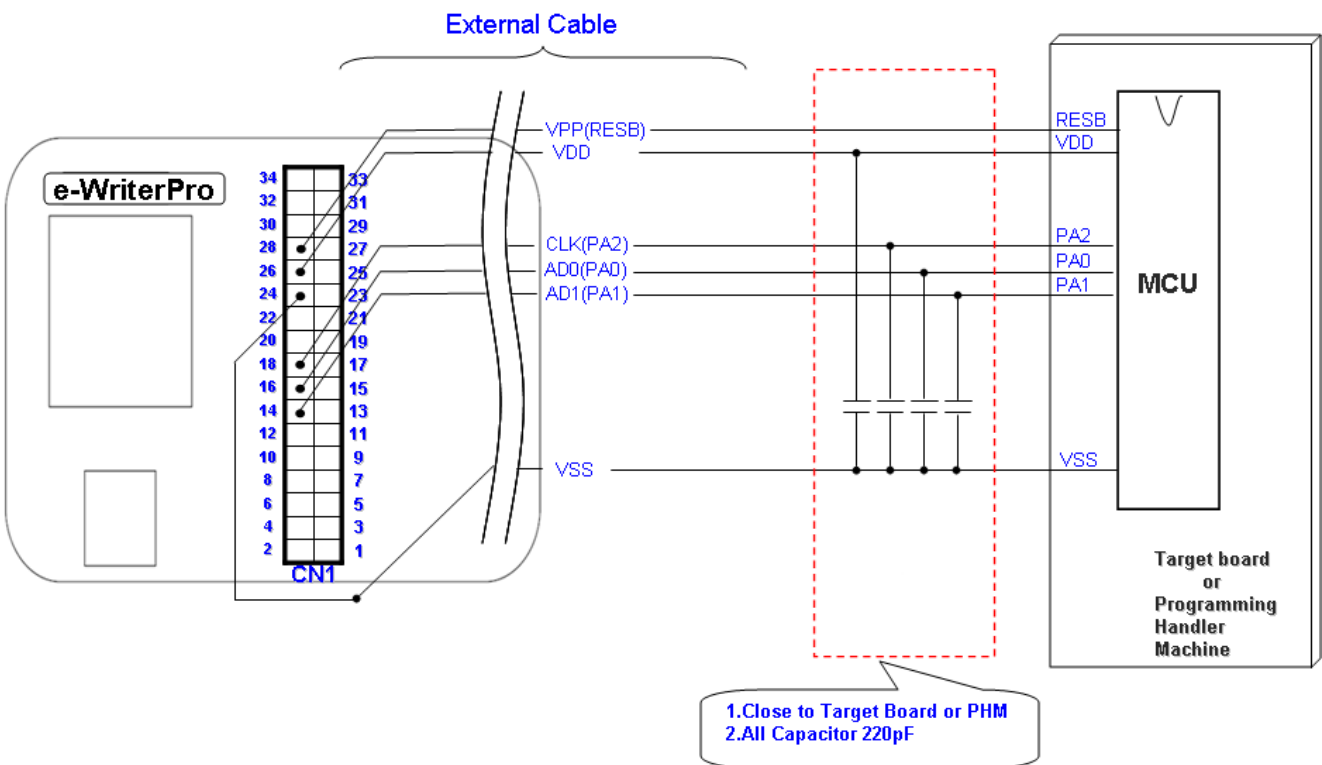


Fig. 6

6) ICP-1F

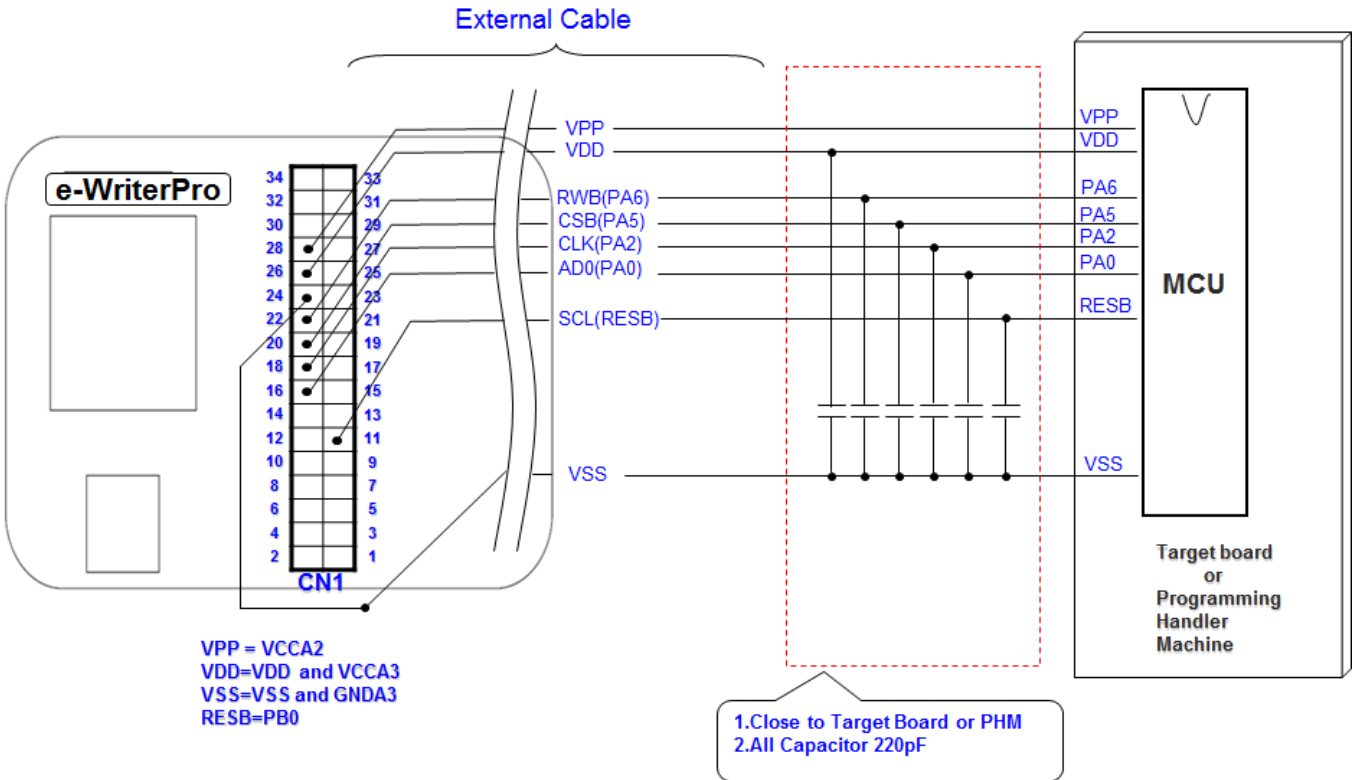


Fig. 7

7) ICP-2A

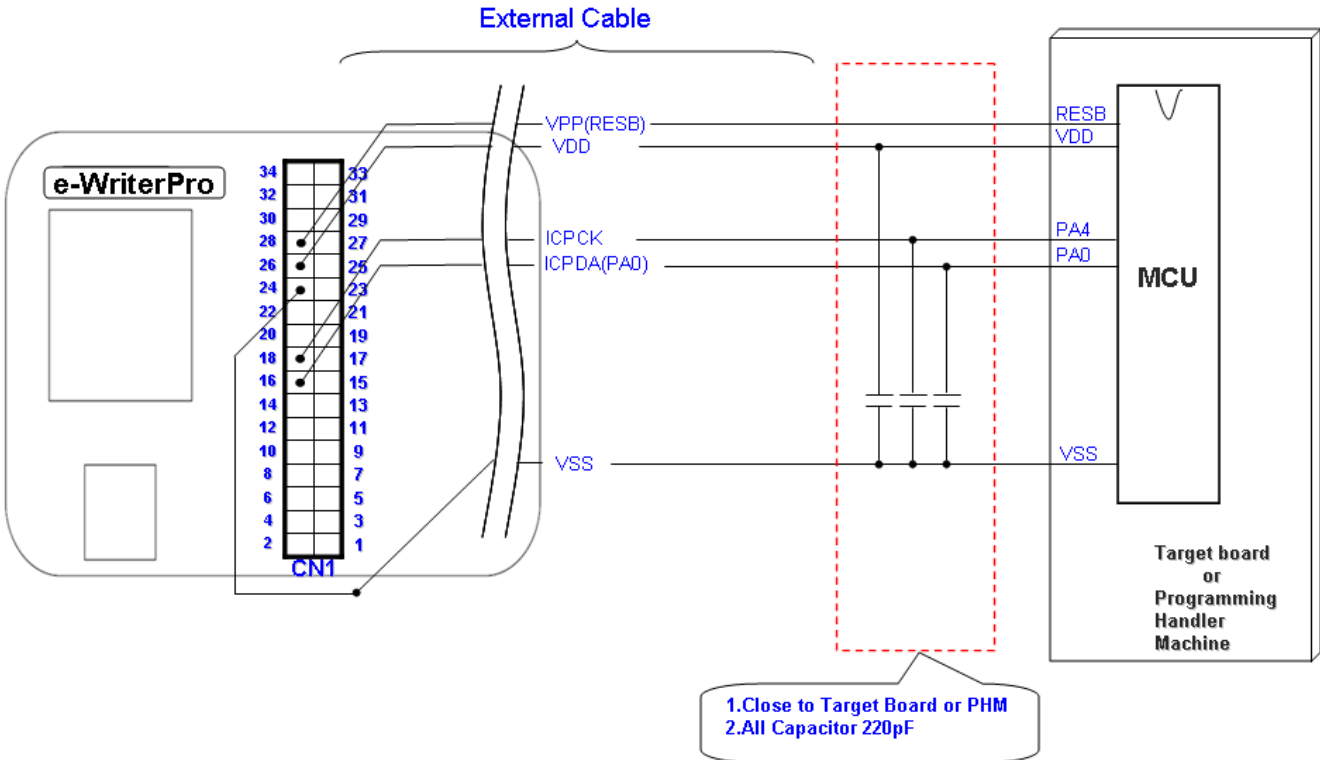


Fig. 8



8) ICP-2B

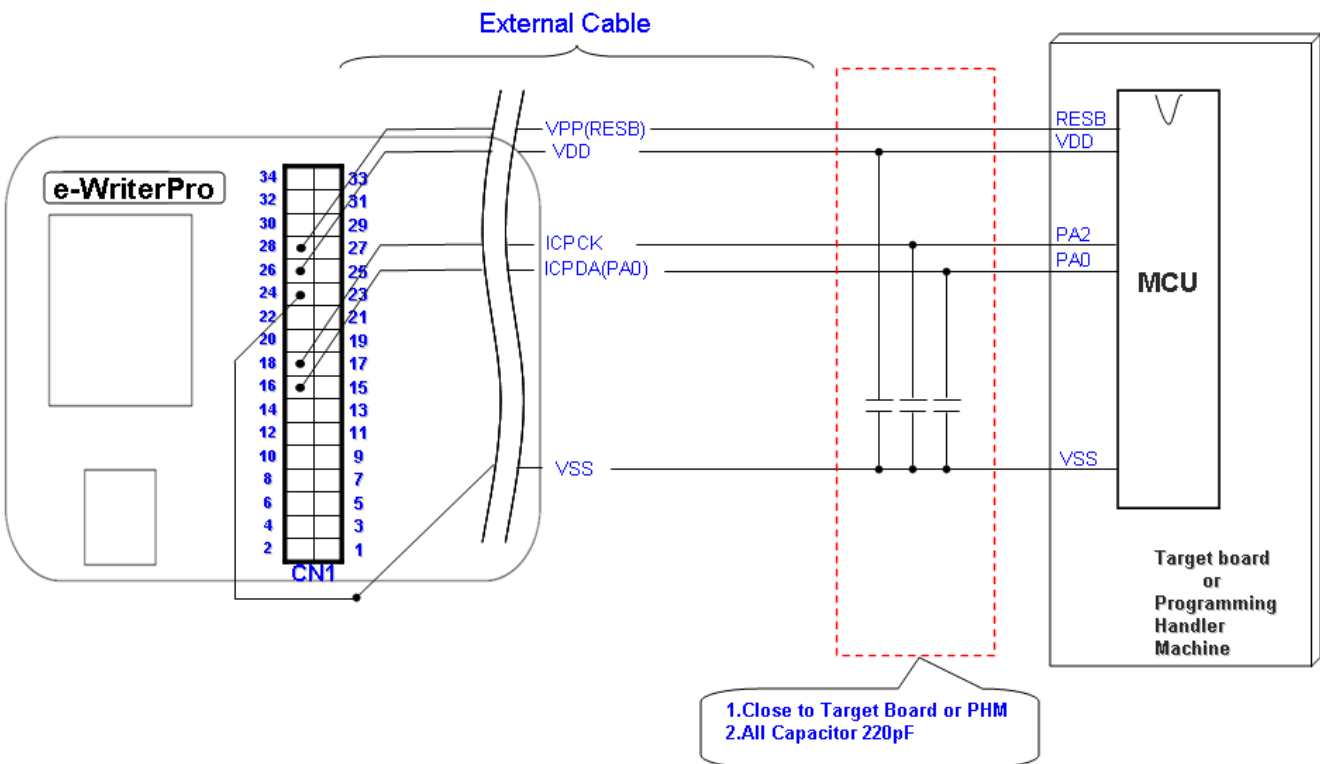


Fig. 9

9) ICP-2C

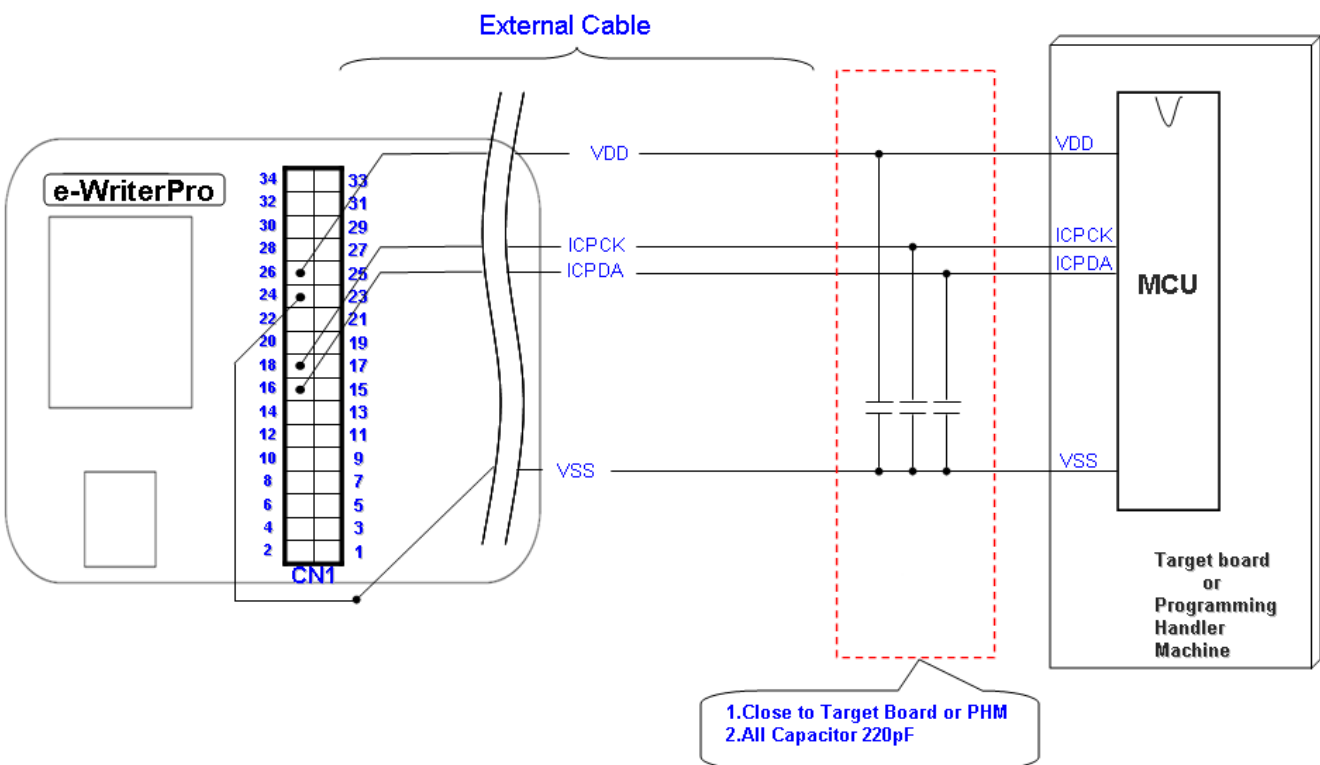


Fig. 10

※The MCU real pin name of ICPDA/ICPCK is different from every MCU. Please refer to the related chapter of each MCU datasheet.

### 3. e-Link ICP (In-Circuit Programming)

Under construction....

## 4. ICP programming notes

### 4.1 “IO/ADC pin share with ICP/OCDS” note

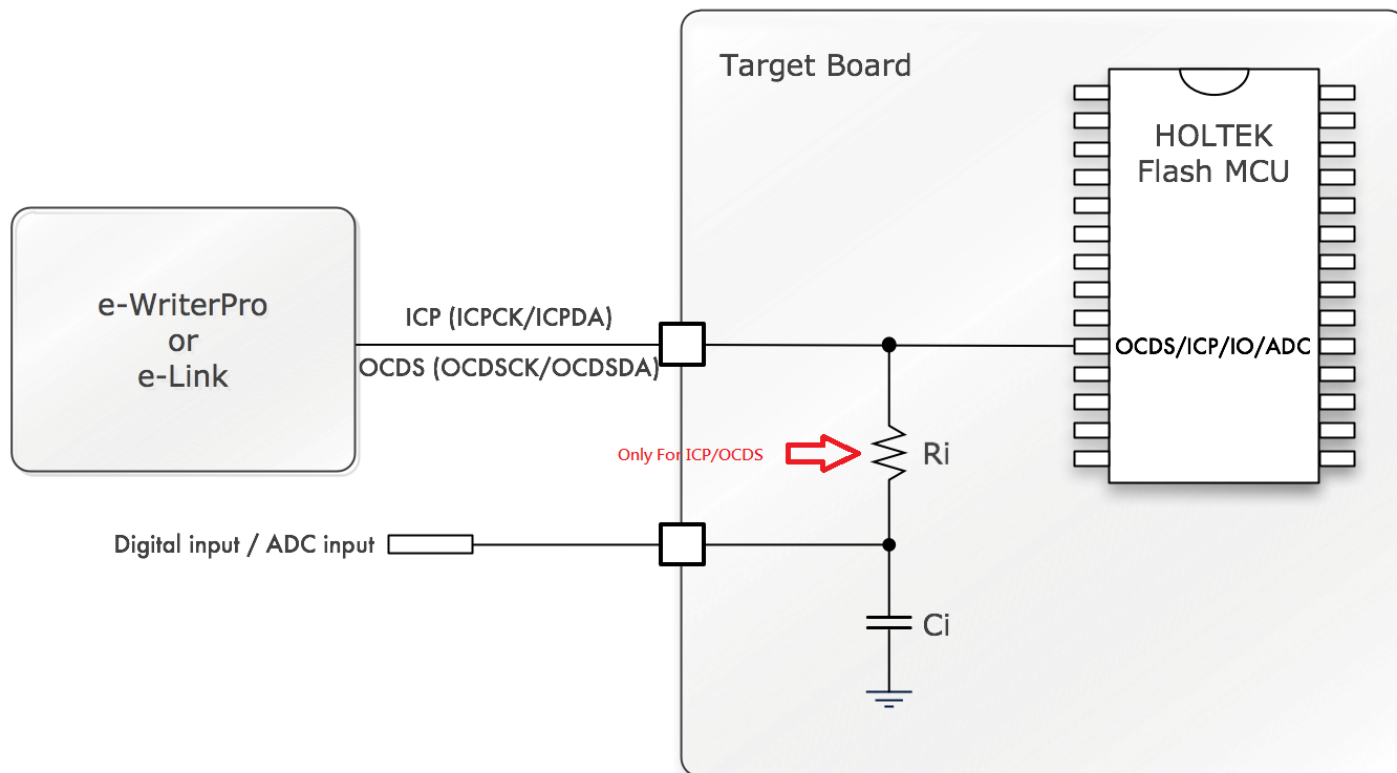


Fig. 11

1. The I/O or ADC, which is pin-share with ICP/OCDS, can only be used as the digital input or ADC input. But they can't be used as output, or it may affect the ICP/OCDS communication.
2. The programming pin (ICPCK/ICPDA) of the ADC MCU may be pin-share with ADC input pin. On the Chapter.4 “ICP Programming Note” says, “the programming line capacitive load should be less than 10pF” , but ADC MCU sometimes needs capacitor (Ci) on AD input for filter, and it may affect the ICP/OCDS communication. We suggest connecting a resistor (Ri) in series like below figure.12 on your circuit to make the ICP/OCDS communication well.

Below tables describes how many ohm of resistor (Ri) you may uses.

Capacitive Load (Ci)	Minimal Needed resistor (Ri)
0.47uF	330Ω
0.1uF	220Ω
0.047uF	100Ω

1000pF	68Ω
100pF	33Ω
<10pF	0 Ω

Table. 2

## 4.2 “ICP tool setup application” note

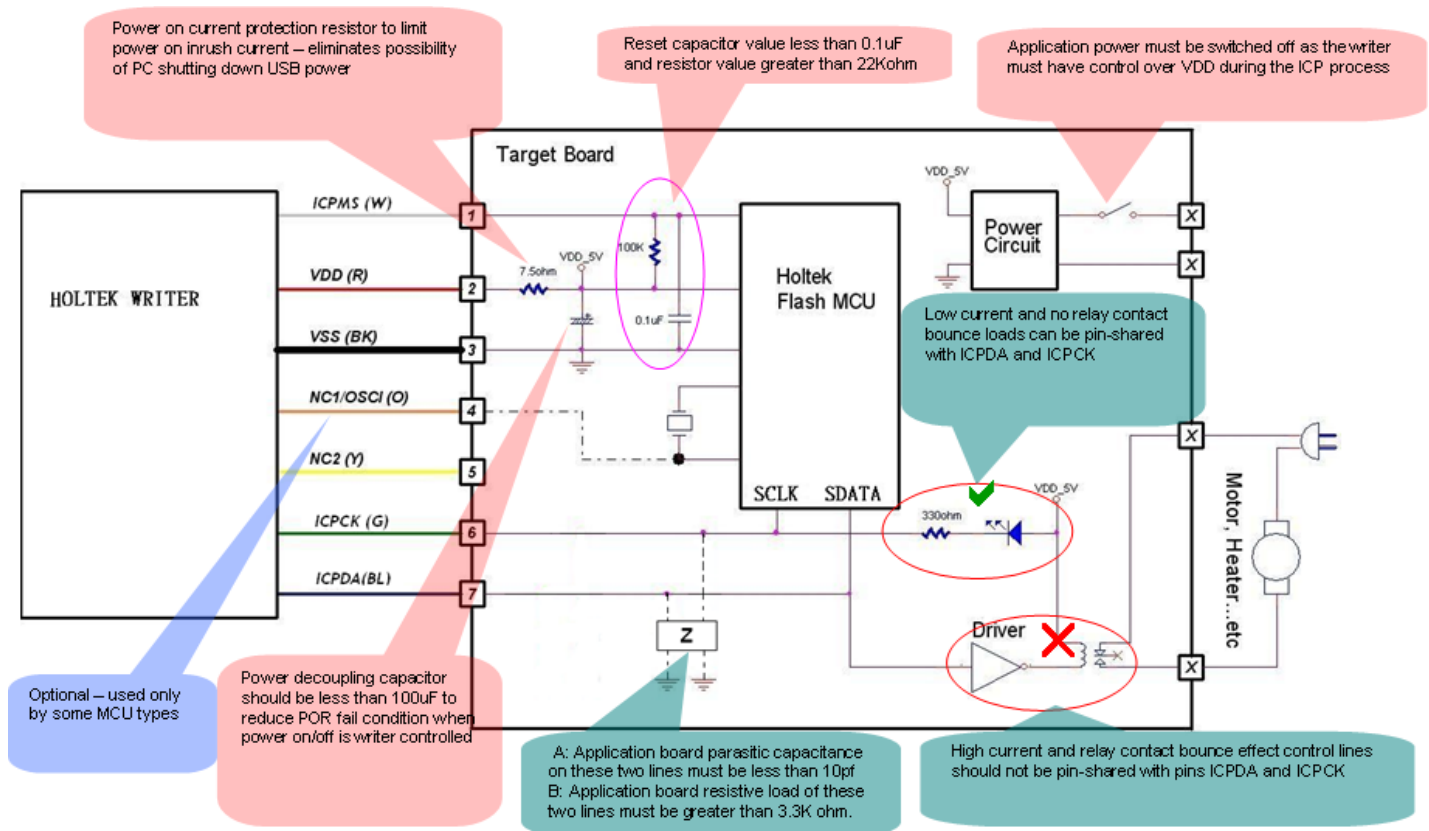


Fig. 12

Note: if e-WriterPro is used for ICP programming following the above procedures, and is still ineffective, then it may be due excessively long lines or poor signal quality. The following steps can be tried to eliminate the problem:

1. Insert a 33~100 ohm resistor in the line between the Target Board and the Holtek Writer SDATA pin
2. Insert a 33~100 ohm resistor in the line between the Target Board and the Holtek Writer SCLK pin

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