HY17M24 Series
ENOB Tool Instruction Manual

Table of Contents

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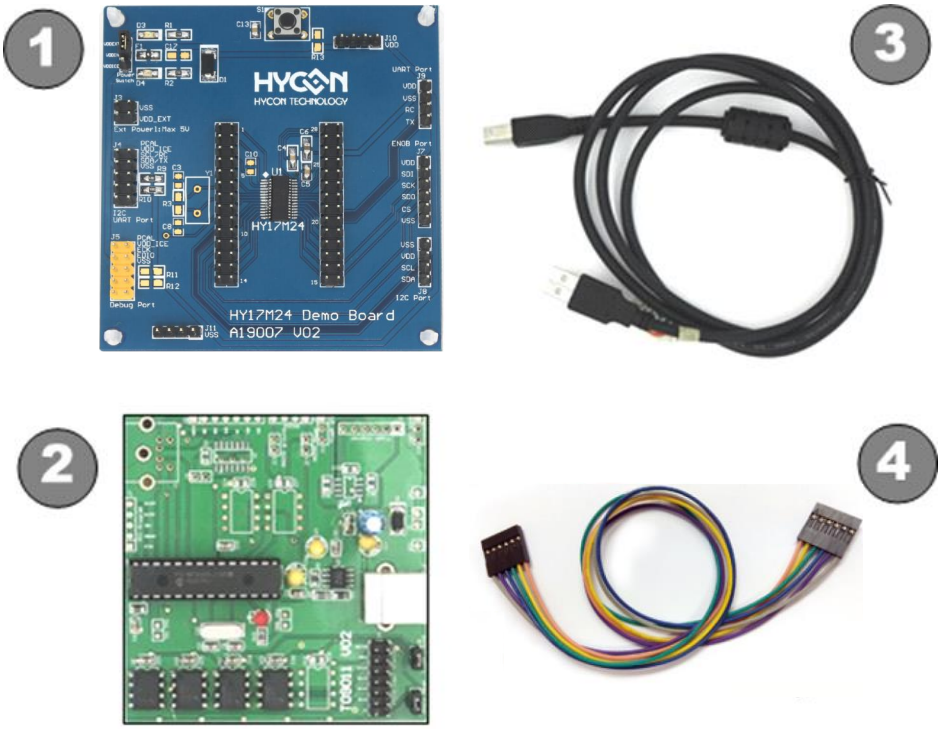
1. Package Contents

HY17M24-AK01 is an ENOB (Effective Number of Bits) performance evaluation and signal sampling analysis tool for ΣΔ ADC of HY17M24 series products, including ENOB Control Board, Target Board, USB Cable and Interface line. The related hardware is equipped as shown below:



Model No.	Part Name	Description	Quantity
HY17M24-AK01	1. HY17M24-AM01	HY17M24-ES28 Target Board	1
	2. HY17000-CM01	HY17 ENOB Control Board	1
	3. Cable line	USB Type A to Mini B Cable	1
	4. Interface line	6pin/2.54 (2.54mm pitch)	1

Table 1-1

Note: The HY17M24-ES28 chip on the HY17M24-AM01 (i.e. HY17M24-ES28 Target Board) has been programmed with the "HY17M24_ENOB-Test-V01.hex" code before shipment for use as an ENOB tool.

2. Safety Precautions

- Do not place heavy objects on the display panel, in order to avoid damage caused by stress.
- Place the application display boards at steady place, so as to avoid falling damage.
- Do not use this product with the input voltage which is not meeting the electrical specifications, , in order to avoid working abnormally or damage
- Avoid application display boards being touched by liquid, dirt and avoid being exposed to moisture during operation. This application should be kept in a dry environment, so as not to affect the function and performance
- Remove the power supply when not using it.
- When following status occurred, please remove the power supply immediately, and contact our engineer.
  - Power Supply line is worn or damaged.
  - Power source (battery) connected but no any light on while operating.
  - Component off.

3. Software Installation Requirements

3.1. ENOB Software Installation Requirements

Minimum System Requirements of operating HY17M24 ENOB Tool:

(1) PC/NB hardware requirement:
IBM PC compatible X86 system CPU
512MB Memory (1GB recommended)
1GB Hard disk

(2) Supported Products:
HY17P/HY17M Series Products

(3) Supported Hardware Model No.:
HY17M24-AK01：HY17M24 ENOB Tool

(4) Supported software version:
HY17 ENOB software V1.0 above

(5) Supported Operating system:
Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10

(6) Apply the following interface modes:
USB Port with HID-compliant device

3.2. Software Installation

(1) USB Port Driver Installation:
The HY17M24-AK01's USB Port driver uses the Windows standard HID driver (Figure 3-1), so you can use it without installing a separate driver.

Figure 3-1

(2) ENOB Tool software Installation:

Unzip the ENOB software package and run setup to install the software (as shown in Figure 3-2). After installation, run HY17 ENOB in the \HYCON\ HY17 ENOB directory to start the ENOB software.

Note: please use “system administrator” to operate the software.

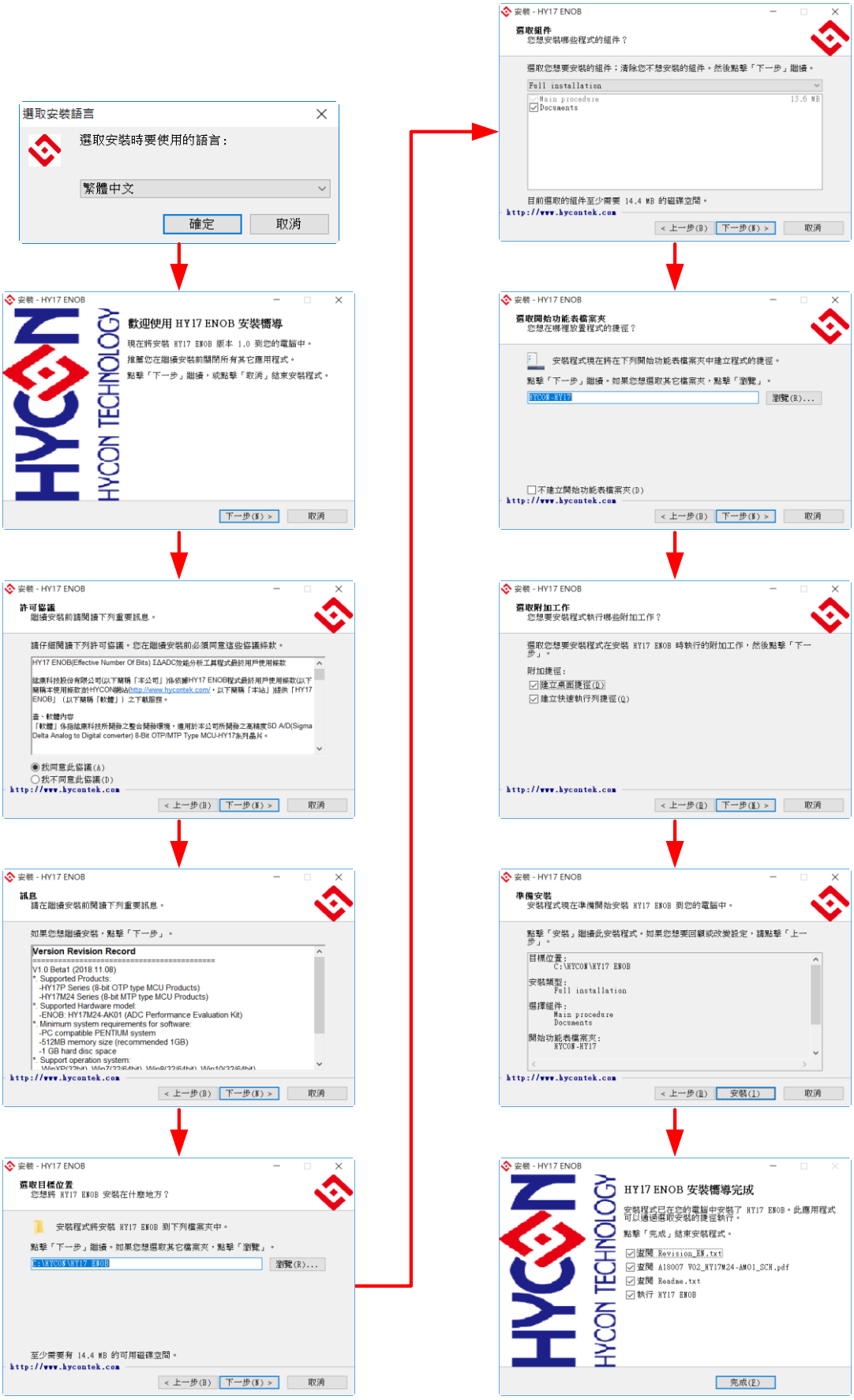
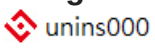

選取安裝語言
選取安裝時要使用的語言：
繁體中文
確定
取消
安裝 - HY17 ENOB
歡迎使用 HY17 ENOB 安裝精靈
現在將安裝 HY17 ENOB 版本 1.0 到您的電腦中。
推薦您在繼續安裝前關閉所有其它應用程式。
點擊「下一步」繼續，或點擊「取消」結束安裝程式。
下一步(N) >
取消
HYCON TECHNOLOGY
許可協議
繼續安裝前請閱讀下列重要訊息。
請仔細閱讀下列許可協議。您在繼續安裝前必須同意這些協議條款。
我同意此協議(A)
我不同意此協議(D)
< 上一步(B)
訊息
請在繼續安裝前閱讀下列重要訊息。
如果您想繼續安裝，點擊「下一步」。
Version Revision Record
V1.0 Beta1 (2018.11.08)
選取目標位置
您想將 HY17 ENOB 安裝在什麼地方？
安裝程式將安裝 HY17 ENOB 到下列檔案夾中。
點擊「下一步」繼續。如果您想選取其它檔案夾，點擊「瀏覽」。
C:\HYCON\HY17 ENOB
瀏覽(R)...
至少需要有 14.4 MB 的可用磁碟空間。
http://www.hycontek.com
選取組件
您想安裝哪些程式的組件？
選取您想要安裝的組件；清除您不想安裝的組件。然後點擊「下一步」繼續。
Full installation
Main procedure
Documents
13.6 MB
目前選取的組件至少需要 14.4 MB 的磁碟空間。
選取開始功能表檔案夾
您想在哪裡放置程式的捷徑？
安裝程式現在將在下列開始功能表檔案夾中建立程式的捷徑。
點擊「下一步」繼續。如果您想選取其它檔案夾，點擊「瀏覽」。
HYCON-HY17
瀏覽(R)...
不建立開始功能表檔案夾(D)
選取附加工作
您想要安裝程式執行哪些附加工作？
選取您想要安裝程式在安裝 HY17 ENOB 時執行的附加工作，然後點擊「下一步」。
附加捷徑：
建立桌面捷徑(D)
建立快速執行列捷徑(Q)
準備安裝
安裝程式現在準備開始安裝 HY17 ENOB 到您的電腦中。
點擊「安裝」繼續此安裝程式。如果您想要回顧或改變設定，請點擊「上一步」。
目標位置：
C:\HYCON\HY17 ENOB
安裝類型：
Full installation
選擇組件：
Main procedure
Documents
開始功能表檔案夾：
HYCON-HY17
安裝(I)
HY17 ENOB 安裝精靈完成
安裝程式已在您的電腦中安裝了 HY17 ENOB。此應用程式可以通過選取安裝的捷徑執行。
點擊「完成」結束安裝程式。
查閱 Revision_EN.txt
查閱 A18007 V02_HY17M24-AM01_SCH.pdf
查閱 Readme.txt
執行 HY17 ENOB
完成(F)

Figure 3-2

3.3. Uninstalling the software

Directly run  under the ENOB software directory to uninstall the ENOB software.

4. Introduction to ENOB Tools

4.1. Architecture description

The HY17000-CM01 Control Board is a control device between the HY17M24-AM01 Target Board and the ENOB software, and use the 6-wire Interface line and USB cable to connect as an ENOB tool, the assembly diagram is as follows:

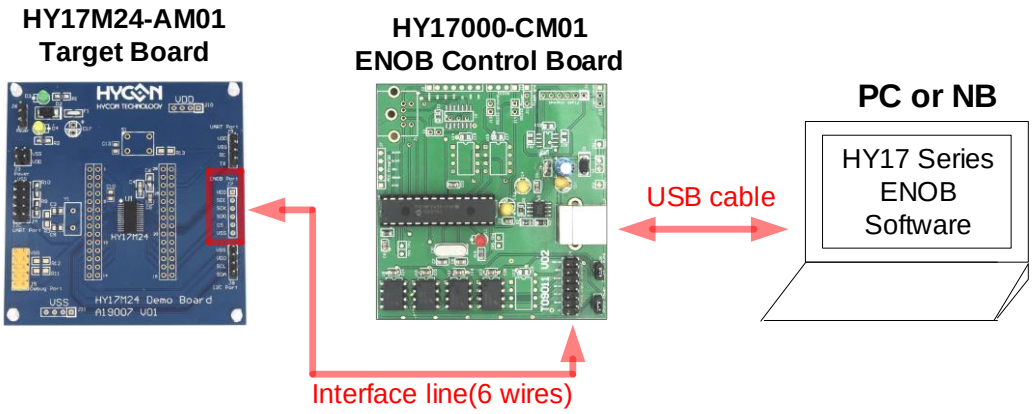


圖 4-1

4.2. ENOB Control Board Instruction

ENOB Control Board (Model: HY17000-CM01) is commonly used in HYCON 8-bit & 32-bit MSP Series products (appearance shown in Figure 4-2). It is mainly used to control the register on the Target Board and transmit the sampled ADC signal to the ENOB software of the computer through USB communication for analysis. The following is the introduction of the control board:

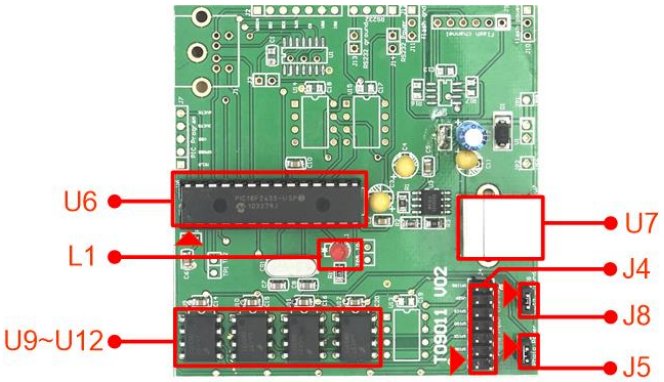


Figure 4-2

(1) U6

Feature: Main chip of ENOB Control Board.

(2) L1

Feature: Control Board power indicator, when L1 is on, it means the Control Board is powered normally.

(3) U9~U12

Feature: Photo coupler, used to isolate the SPI communication between the main chip of the control board and the Target Board.

Description: The control board uses 6-wire SPI communication (i.e. VDD, VSS, CS, SCK, SDO, SDI) to communicate with the Target Board.

(4) U7

Feature: USB Type B cable connector.

(5) J4

Feature: 6-wire SPI communication interface for the Control Board.

Description: Pin are defined as follows

Pin	Name	Description
1-2	VP	Chip power supply (connected to Target Board chip's VDD)
3-4	SPIDI	SPI's DI pin (connected to Target Board chip's SDI)
5-6	SPICK	SPI's CK pin (connected to Target Board chip's SCK)
7-8	SPIDO	SPI's DO pin (connected to Target Board chip's SDO)
9-10	SPICS	SPI's CS pin (connected to Target Board chip's CS)
11-12	VSSP	Chip power ground (connected to Target Board chip's VSS)
13-14	SPIIRQ	Reserved

(6) J8

Feature: Control Board power ground.

Description: Pin are defined as follows

Pin	Name	Description
1	VSS	U6 main chip ground of control board
2	VSSP	connected to Target Board chip's VSS

(7) J5

Feature: Control Board power supply.

Description: Pin are defined as follows

Pin	Name	Description
1	VP	connected to Target Board chip's VDD
2	VDD	U6 main chip power supply of control board

Note: The following explains the setting of the signal between the ENOB control board and the target board with or without isolation (i.e. U9~U12).

"**With isolation**": Do not short between J8 pin1-2 and J5 pin1-2. The chip power of the Target Board (i.e. VP / VSSP) should be powered independently. At this time, the signals between the ENOB control board and the Target Board will be isolated.

"**Without isolation**": J8 pin1-2 and J5 pin1-2 both need to be short, which means that the power supply of the ENOB control board and the Target Board are connected together, and the signals will not be isolated at this time.

4.3. ENOB Control Board Circuit Diagram

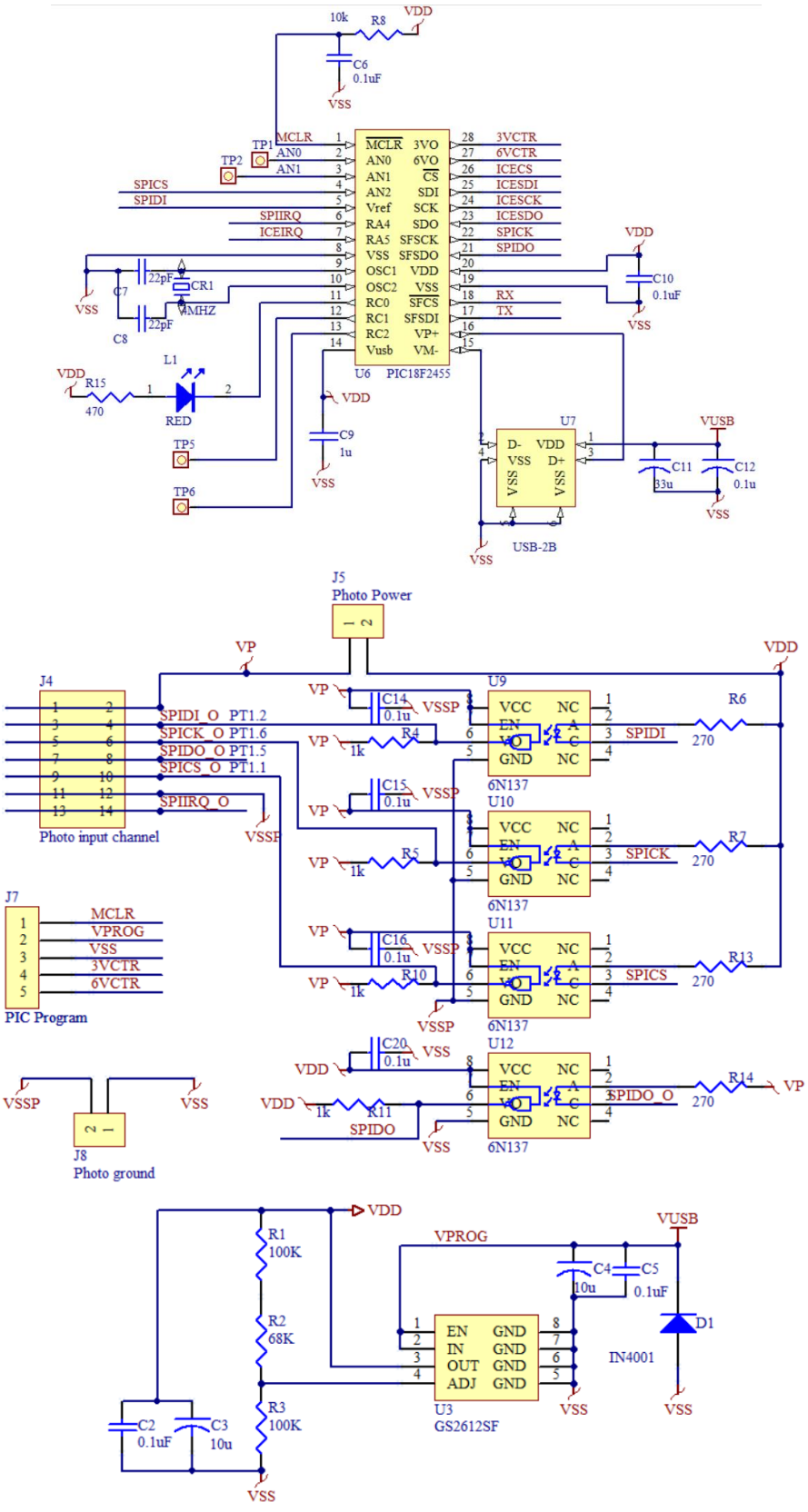


Figure 4-3

4.4. Target Board Instruction

Target Board (Model: HY17M24-AM01) commonly used in HY17M24 series products (appearance is shown in Figure 4-4). This Target Board can be used as an ENOB tool as well as a demo board.

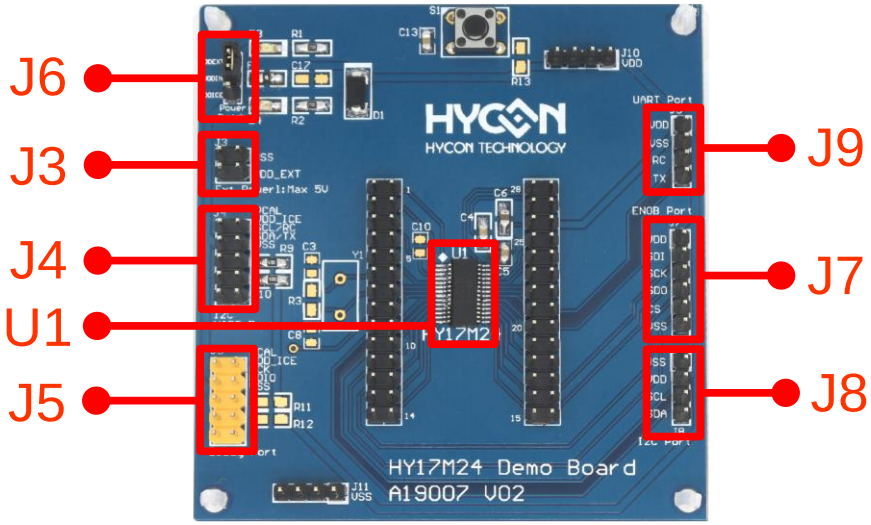


Figure 4-4

Note: Burn HY17M24_ENOB-Test-V01.hex in the ENOB software directory (HYCON\HY17 ENOB\DemoCode) into HY17M24-ES28 (i.e. U1) before HY17M24-AM01 is use as target board of the ENOB Tool.

(1) U1

Feature: Target Board Chip, called HY17M24 (Part No: HY17M24-ES28).

(2) J3

Feature: External Power source VDD_EXT pin.

Description: Pin are defined as follows

Pin	Name	Description
1-1	VSS	Power ground pin
2-2	VDD_EXT	External Power supply pin

(3) J4

Feature: Target Board Chip's UART/I^2C interface port and also can be used as the secondary Debug port and HAO calibration pin.

Description: Pin are defined as follows

Pin	Name	Description
1-1	PCAL	HAO calibration pin
2-2	VDD	External Power supply pin
3-3	SCL/RC/ECK2	UART RX pin, I^2C and Debug Port2's clock pin (with pull-up 4.7KΩ on board)

4-4	SDA/TX/EDIO2	UART TX pin, I²C and Debug Port2's data pin (with pull-up 4.7KΩ on board)
5-5	VSS	Power ground pin

(4) J5

Feature: Target Board Chip's primary Debug port and HAO calibration pin.

Description: Pin are defined as follows

Pin	Name	Description
1-1	PCAL	HAO calibration pin
2-2	VDD	External Power supply pin
3-3	ECK	Debug port's clock pin
4-4	EDIO	Debug port's data pin
5-5	VSS	Power ground pin

(5) J6

Feature: Target Board Chip's VDD power source selection.

Description: Pin are defined as follows

Pin	Name	Description
1	VDD_ICE	Target Board Chip's VDD power is coming from Control Box
2	VDD_IN	Target Board Chip's VDD power
3	VDD_EXT	Target Board Chip's VDD power is coming from external power

(6) J7

Feature: Target Board Chip's SPI interface (implemented with firmware) port. The main purpose is to be able to connect to the ENOB tool's control board SPI for use as an ENOB demo board.

Description: Pin are defined as follows

Pin	Name	Description
1-1	VDD	Target Board chip 's Power Pin
2-2	SDI	Target Board chip 's SDI Pin
3-3	SCK	Target Board chip 's SCK Pin
4-4	SDO	Target Board chip 's SDO Pin
5-5	CS	Target Board chip 's CS Pin
6-6	VSS	Power Ground pin

(7) J8

Feature: Target Board Chip's I²C interface port.

Description: Pin are defined as follows

Pin	Name	Description
1-1	VSS	Power ground pin
2-2	VDD	Target Board Chip's VDD power
3-3	SCL	I²C's clock pin
4-4	SDA	I²C's data pin

(8) J9

Feature: Target Board Chip's UART interface port.

Description: Pin are defined as follows

Pin	Name	Description
1-1	VDD	Power ground pin
2-2	VSS	Target Board Chip's VDD power
3-3	RC	UART's receive pin
4-4	TX	UART's transform pin

Note：The above only describes the basic functions that the Target Board will use, for other unlisted parts, please refer to the circuit diagram or contact FAE technical support.

4.5. Target Board Circuit Diagram

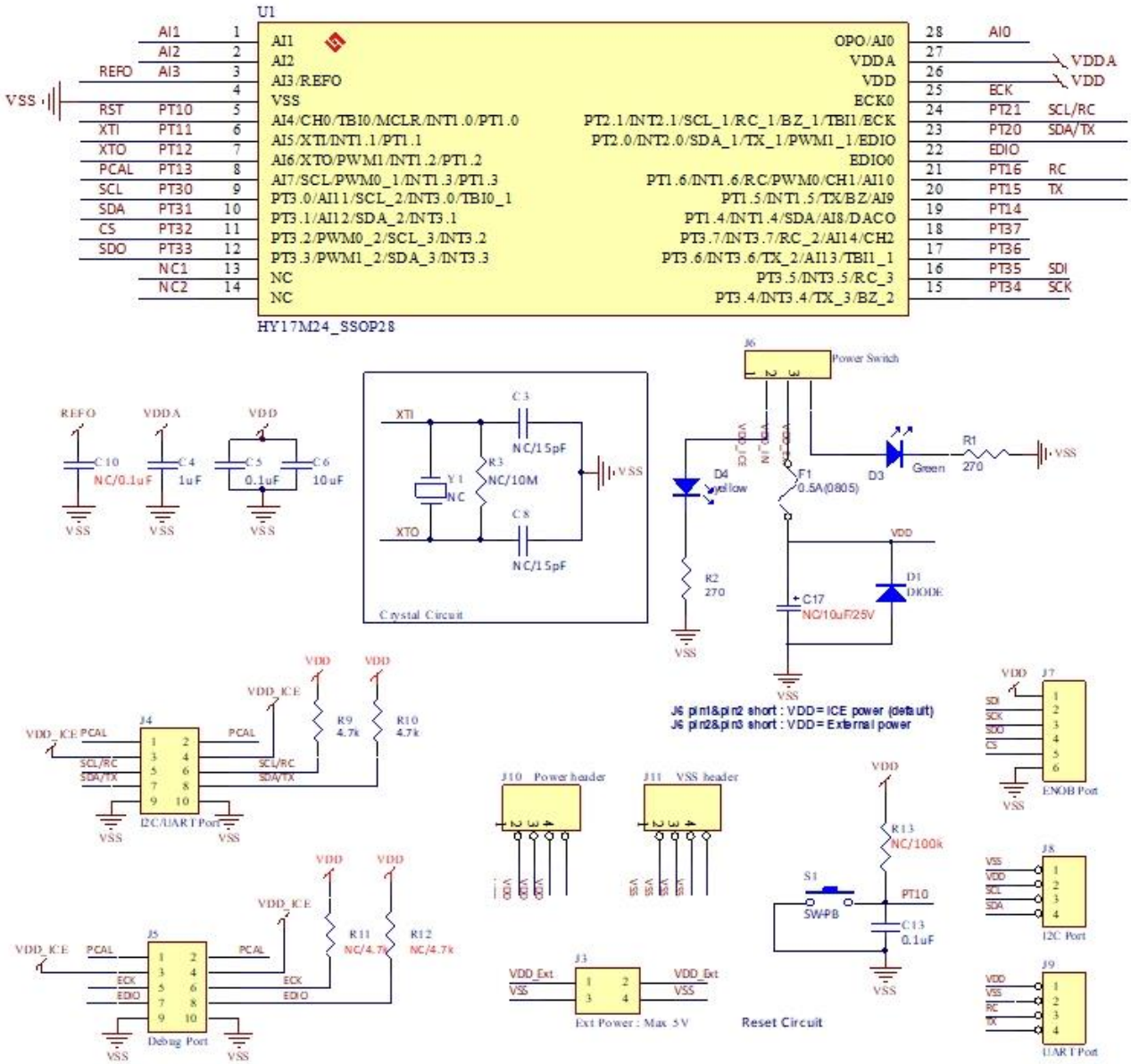


Figure 4-5

Note : This Target Board circuit diagram " HY17M24-AM01_Target Board_A19007 V02.pdf " is placed in the ENOB software directory (i.e. HYCON\HY17 ENOB\Schematic) and can be referenced by yourself

4.6. Control Board and Target Board Connection Steps

Step1: Make sure that Target Board's J6 pin is shorted.

Step2: Connect the Control Board's J4 and Target Board's J7 with the 6-wire JTAG interface line

Step3: Connect the sensor and Target Board.

Step4: Use the USB Cable to connect to the Control Board's USB Port and the computer's USB port (the L1 LED will light up).

Step5: After Step 1~3 (as shown in Figure 4-6), the hardware connection is completed. Please refer to Chapter 5 ENOB Software Introduction to operating the software.

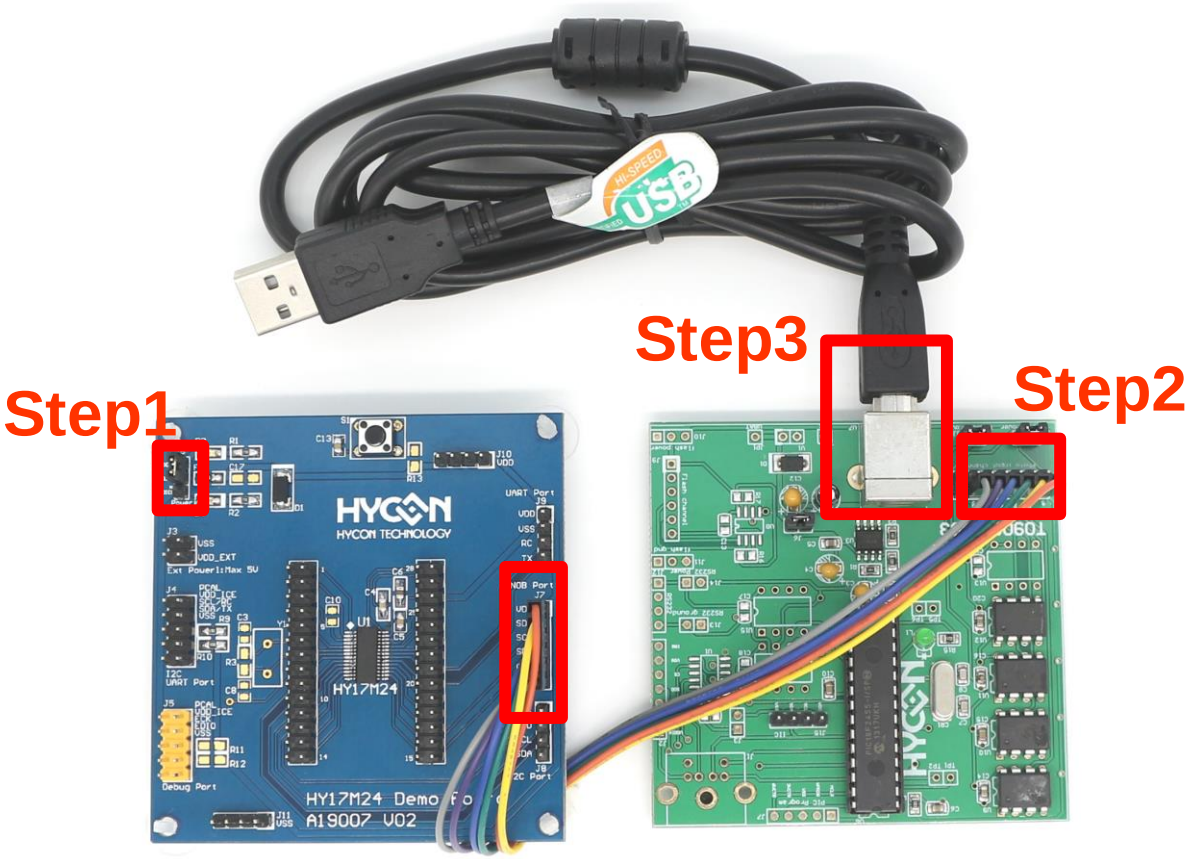


Figure 4-6

5. ENOB Software introduction

Opening the HY17 ENOB software, a window will appear (shown as Figure 5-1). The HY17 ENOB software is divided into two parts: 1. Software Information, 2. Menu, the following will introduce each part:

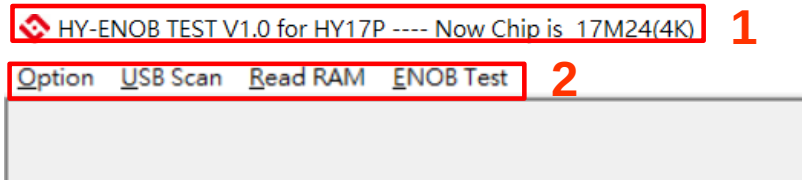


Figure 5-1

5.1. Software Information

The software information include software version and supported products (shown as Figure 5-2), support HY17P and HY17M series products, the chip model will appear after the software is successfully connected. (For example: ---- Now Chip is 17M24 (4K) means that the chip model selected by user for analysis is HY17M24.)

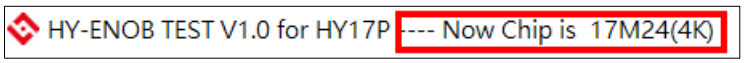


Figure 5-2

5.2. Menu

The software menu is divided into four parts, which are "**Option**", "**USB Scan**", "**Read RAM**" and "**ENOB Test**" (Figure 5-3).

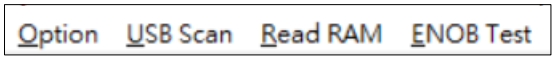


Figure 5-3

5.2.1. Option

There are five function pages, which are "Setup", "RAM Panel", "REG Panel", "ADC Type I Panel", and "ADC Type II Panel"(Figure 5-4), the function instructions of each page are as follows:

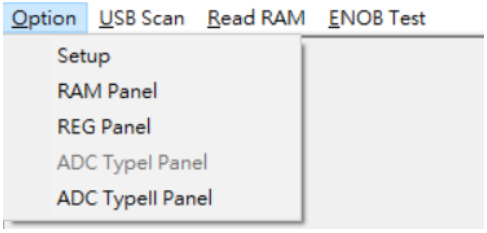


Figure 5-4

5.2.1.1. Setup

The "Setup" page contains a variety of functions. The following mainly introduces the two functions of the "Select Chip" and "Communication" (refer to Figure 5-5, other pages users do not need to use it, please keep the default setting):

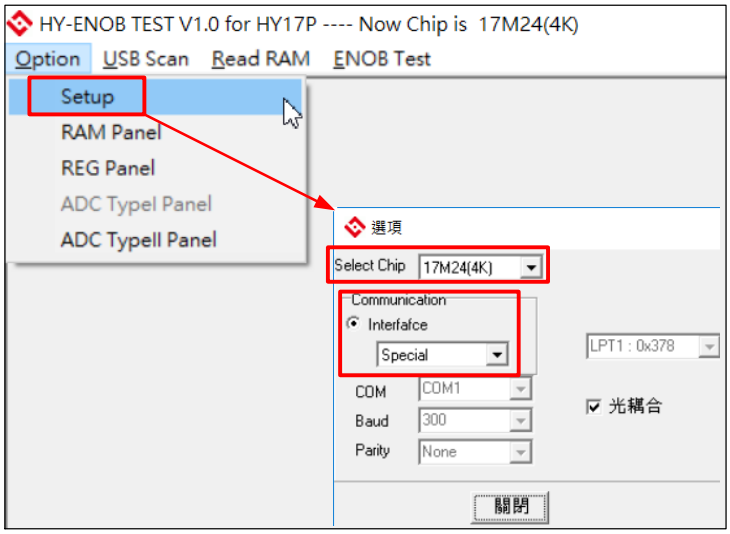


Figure 5-5

● Select Chip

The "Select Chip" menu is to select the MCU model to be analyzed by the ENOB software. The selected model must be the same as the MCU model on the Target Board, otherwise the ENOB software cannot work normally.HY17 ENOB supports HY17P and HY17M series products (Figure 5-6). For example: HY17M24 products are represented by 17M24 (4K), and so on.

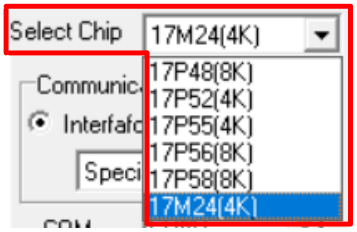


Figure5-6

● Communication

There are many types of communication mode between ENOB software and devices (refer to Figure 5-7). The default communication mode by HY17 ENOB software is a custom SPI communication format, which is called "Special". Therefore, the default setting of the software is "Special" mode, please do not change to other settings.

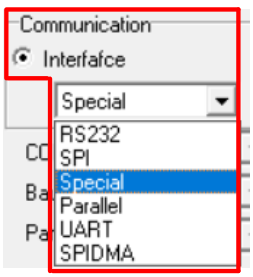


Figure5-7

5.2.1.2. RAM Panel

After clicking the mouse to enter "RAM Panel", the current RAM value of the chip (include BANK page) will be displayed. If the user needs to modify the RAM value of any address, user can move the mouse to that address and double-click to enter Window, you can enter the value you want to modify, and then click "Enter" to finish modification (refer to Figure 5-8).

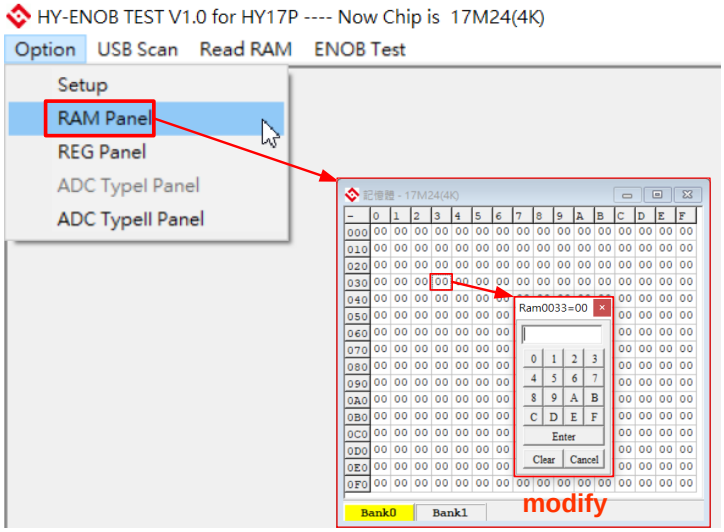


Figure 5-8

5.2.1.3. REG Panel

After clicking the mouse to enter "REG Panel", the current REG value of the chip (include Byte's, Word's, Bit's status) will be displayed. If the user needs to modify the REG value of any address, you can move the mouse to that address and double-click to enter Window, you can enter the value that need to modify, and then click "Enter" to finish modification (refer to Figure 5-9).

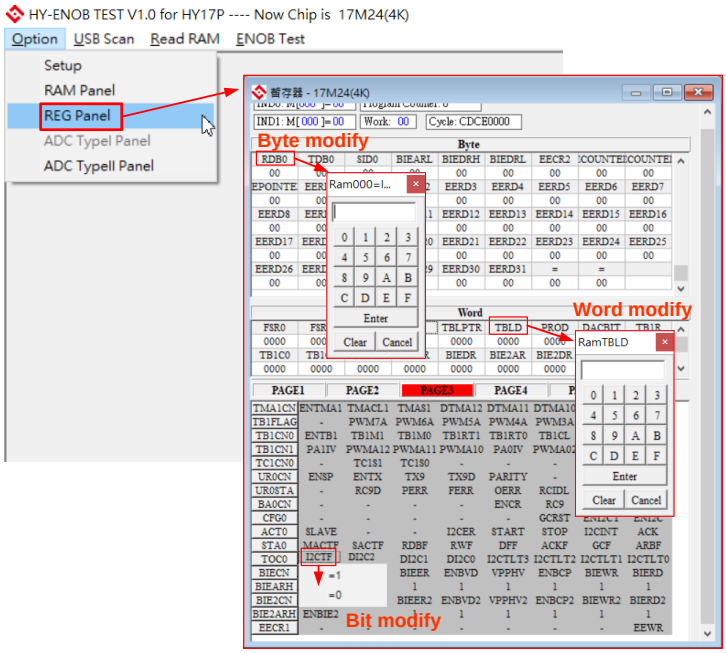


Figure 5-9

5.2.1.4. ADC Type I Panel

Only if user select the chip model is any of the four products which is HY17P48, HY17P52, HY17P55, and HY17P56, the "ADC Type I Panel" option will appear. Click the mouse to enter the "ADC Type I Panel" and the current status will be displayed. The ADC (Graphical User Interface) panel of the chip's ADC hardware structure, users can directly modify settings by clicking the graphics switch or drop-down menu in the panel. Therefore, the corresponding register status will be changed simultaneously (refer to Figure 5-10).

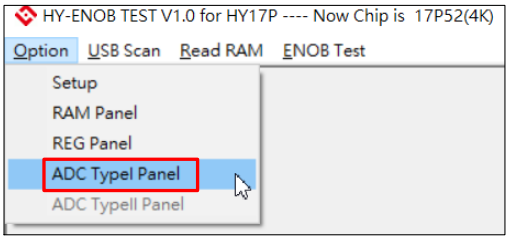


Figure 5-10

Note: Please refer HY17M24 User Guide about the ADC hardware and register introduction, when operating the GUI interface of the HY17 ENOB software.

5.2.1.5. ADC Type II Panel

Only if user select the chip model is either HY17P58 or HY17M24, the "ADC Type II Panel" option will appear. Click the mouse to enter the "ADC Type II Panel" and the current status will be displayed. The ADC (Graphical User Interface) panel of the chip's ADC hardware structure, users can directly modify settings by clicking the graphics switch or drop-down menu in the panel. Therefore, the corresponding register status will be changed simultaneously (refer to Figure 5-11).

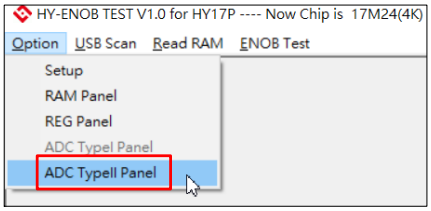


Figure 5-11

Note: Please refer HY17M24 User Guide about the ADC hardware and register introduction, when operating the GUI interface of the HY17 ENOB software.

5.2.2. USB Scan

"USB Scan" is used to start the connection between the ENOB software and the device (such as: Target Board). Whenever the mouse clicks "USB Scan", the connection will start and the result of the connection will be displayed in the status window in the lower left of the screen (as shown in Figure 5-12). The connection status display description is as follows:

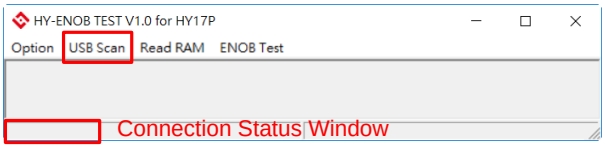


Figure 5-12

5.2.2.1. USB On Line

When the connection status is "USB On Line" (such as Figure 5-13), it means communicate normally between ENOB software and the device. The software can start to analyze.

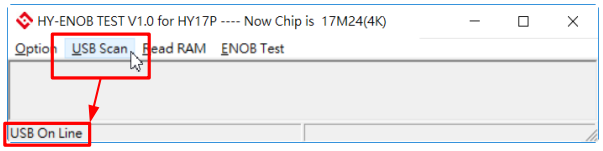


Figure 5-13

5.2.2.2. USB not Connect

When the connection status is "USB not Connect" (such as Figure 5-14), it means communicate anomaly between ENOB software and the device. Please check whether the USB cable or the USB driver is correct.

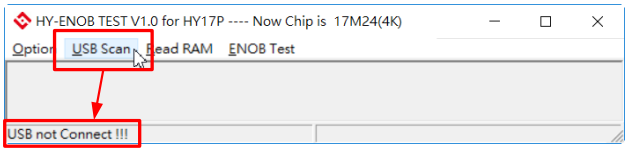


Figure 5-14

5.2.3. Read RAM

"Read RAM" is used to load the RAM and Register status of the chip on the device (such as Target Board) into ENOB software for synchronization. The function instructions are as follows:

- Data before sync

  When ENOB software is connected with HY17M24-AM01, the RAM & REG Panel is shown as follows.

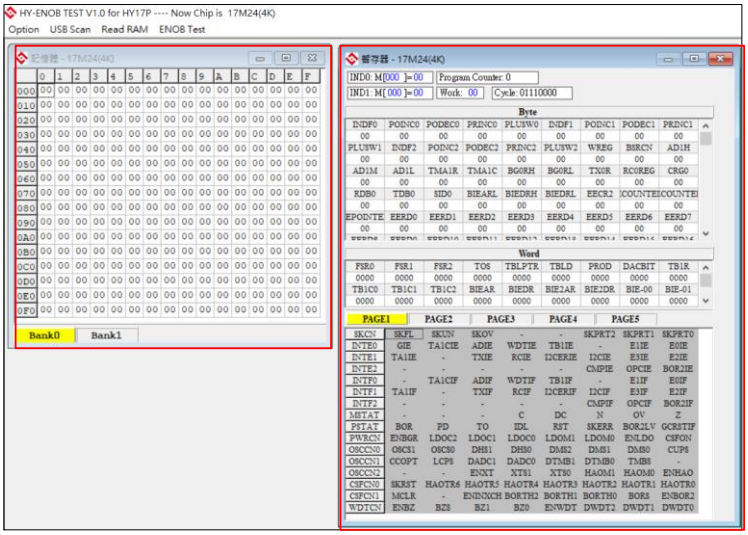


Figure 5-15

- Data after sync

  After the mouse clicks on the "Read RAM" option (as shown in Figure 5-16, the blue part mark that the status has changed), which means the Target Board's RAM Data and REG status has been successfully downloaded to the ENOB software.

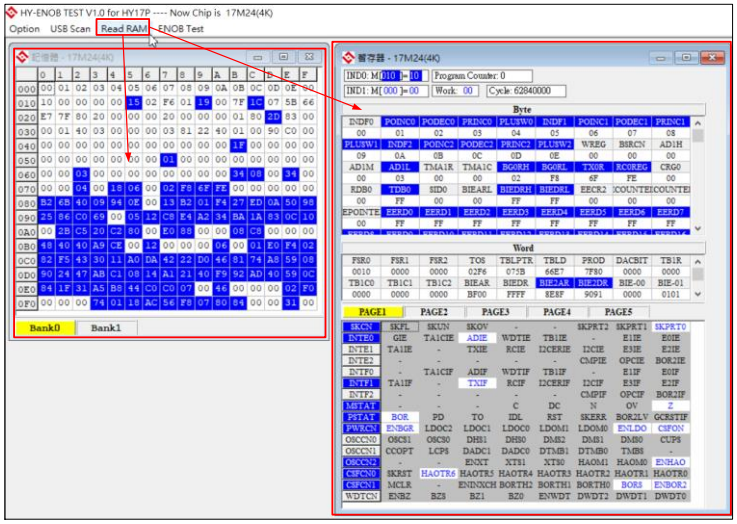


Figure 5-16

Note: Whenever the ENOB software is connected to the device, click the "Read RAM" option to confirm the RAM Panel and REG Panel values of the ENOB software are synchronized with the chip of the device.

5.2.4. ENOB Test

Click the "ENOB Test" option to enter "ENOB Analysis Window" (as shown in Figure 5-17). This window is mainly used to analyze the ADC performance of the chip, such as the ENOB (Effective Number Of Bits)), Noise Free, Average RawData, VP-P Noise (nV), RMS Noise (nV), and VPP's RawData, the operation introduction of the software are as follows:

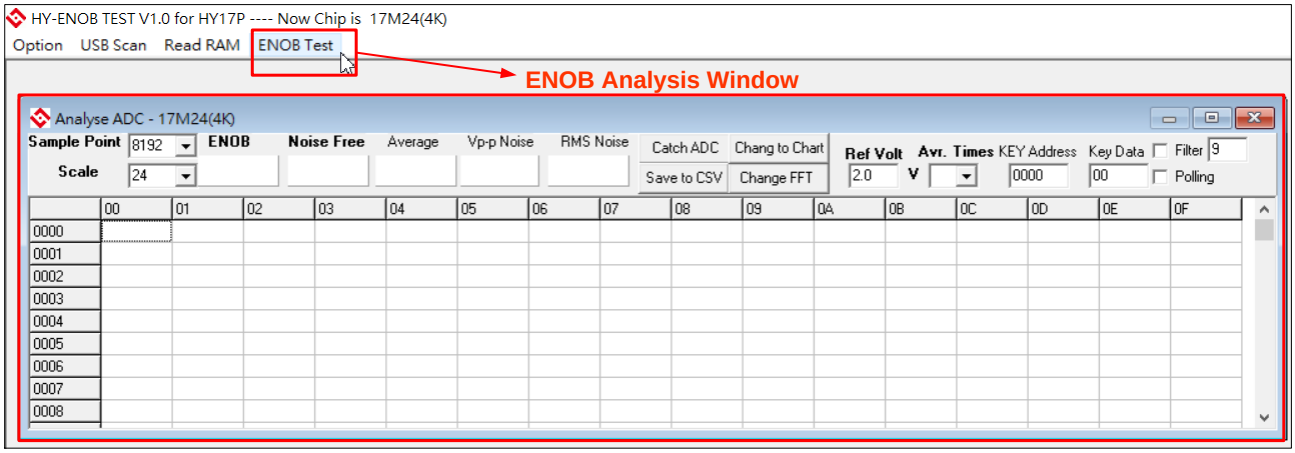


Figure 5-17

- Parameter Setting

  SamplePoint: it is used to set the maximum sampling number of ADC Raw Data (setting range is 32~131072), when the software recorded the number of Raw Data reaches the "SamplePoint" value will stop sampling.

  Scale: it is used to set the ADC Raw Data as the vertical scale of the chart (setting range is 8~24)

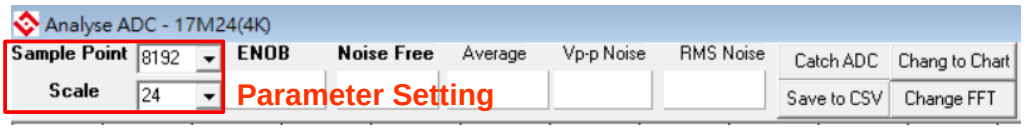


Figure 5-18

- Analysis Result Display Window

  When the ADC performance analysis is completed, the analysis results of ENOB, Noise Free, Average RawData, VP-P Noise (nV), RMS Noise (nV), and Data Logging will be shown in the analysis result window (Figure 5-19)

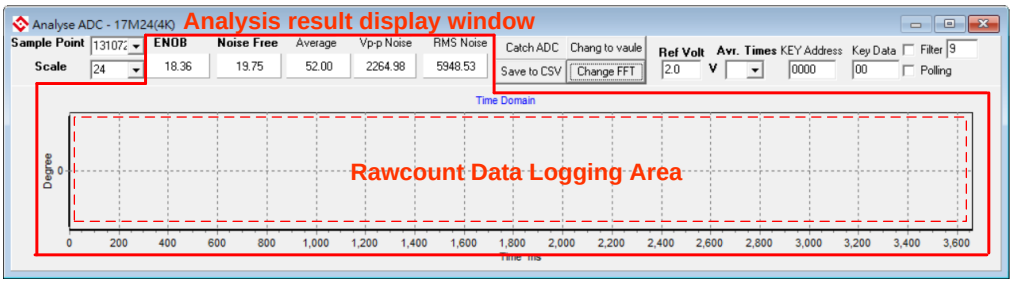


Figure 5-19

- Function Button

  Function Button has three functions, which are "Catch ADC", "Change to Chart" and "Save to CSV", the operation is described as follows:

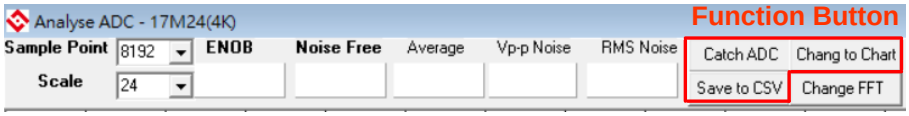


Figure 5-20

Catch ADC: When clicks this button, the software begin ADC analysis, which was sampled from the ADC Raw Data of the sensor on the Target Board via SPI communication, and the Raw Data is recorded and updated in the Data Logging window. When the number of recorded Raw Data reaches the "SamplePoint", the software stop recording and sampling , and the result of analysis is shown in "Average", "VPP(nV) ", "RMS Noise", "VPP(count) ", "ENOB" and "Noise Free" field.
Change to Chart: When you click this button, you can switch the display mode of "data logging area" of ADC raw data to time domain (as shown in Figure 5-21) or display ADC's raw data directly (as shown in Figure 5-22).

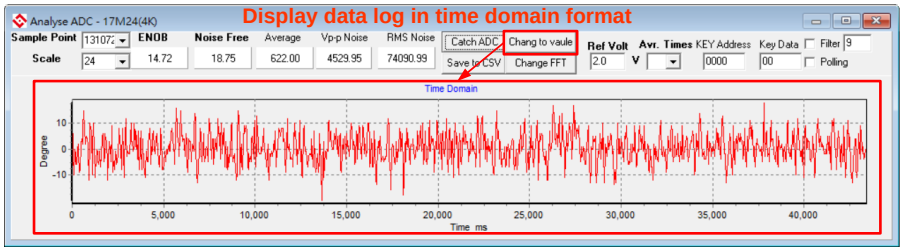


Figure 5-21

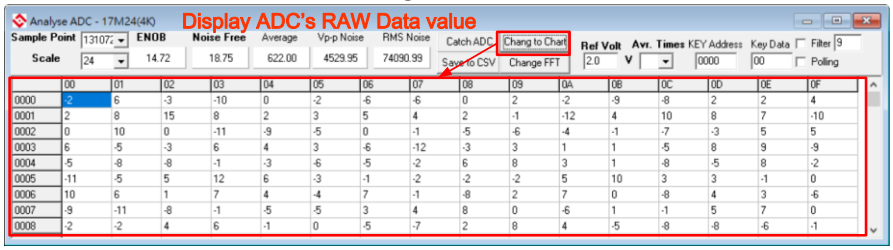


Figure 5-22

Save to CSV: When you click this button, the software will save the ADC raw data and results of ENOB analysis as CSV format

Note:
1. When the software start analyzing, press the "catch ADC" again to stop analyzing.
2. Please don't close the window of "ENOB test" when the software is start analyzing, otherwise it will cause abnormal action of the software.

6. Quick Start

HY17M24 ENOB tool provided by HYCON is mainly used to enable users to evaluate the performance of sensors and further develop practical projects with HY17M series chips. In order to enable users to quickly analyze sensors when they get the ENOB tool, the following steps will be described:

6.1. ENOB Test Code 介紹

The test code with hy17m24 ENOB tool is HY17M24-enob-test-v01.hex, which is the test code developed by HYCON for HY17M24 ENOB tool. The basic settings related to this code are as follows:

- Main Setting: HAO= 2MHz，VDDA= 2.4，ADC_CK= HAO/2= 1MHz.
- ADC Setting: ADGN= x1, VREF= (VDDA-VSS)/2= 1.2V，Chopper On, OSR= 65536, Output Rate= ADC_CK/65536/2= 8 sps.
- ADC IN Setting: INP switch to channel AI0，INN switch to channel AI1.
- Supplementary Note: If the ENOB performance of this test code is tested under the condition of AI0-AI1 short circuit, the result is that the ENOB bit is close to 21.32bit and the RMS noise is up to 0.92uv (refer to Figure 6-1)

ENOB(RMS) with OSR/GAIN at A/D Clock=1MHz, VDD=3.6V, VDDA=2.4V, VREF=(VDDA-VSS)/2=1.2, Chopper On

Max. Vin(mV) =0.9*VREF(1)	OSR					64	128	256	512	1024	2048	4096	8196	16384	32768	65536
	Output rate(Hz)					7813	3906	1953	977	488	244	122	61	31	15	8
	Gain	=	PGAGN	x	ADGN											
±2160	0.25	=	off	x	0.25	15.59	17.06	17.79	18.15	18.72	19.25	19.54	20.07	20.65	21.08	21.42
±2160	0.5	=	off	x	0.5	15.69	16.99	17.62	18.09	18.75	19.22	19.49	19.94	20.54	20.99	21.54
±1080	1	=	off	x	1	15.66	16.96	17.56	18.04	18.5	19.05	19.45	19.88	20.47	20.85	21.32
±540	2	=	off	x	2	15.56	16.74	17.31	17.79	18.35	18.73	18.99	19.66	20.24	20.56	21.14
±270	4	=	off	x	4	15.46	16.27	17.04	17.55	17.98	18.21	18.32	19.18	19.84	20.34	20.75
±135	8	=	off	x	8	15.14	15.54	16.6	16.9	17.3	17.38	17.57	18.51	19.45	19.95	20.41
±68	16	=	off	x	16	14.97	14.61	15.99	16.12	16.45	16.45	16.47	17.6	19.08	19.52	19.89

RMS Noise(uV) with OSR/GAIN at A/D Clock=1MHz, VDD=3.6V, VDDA=2.4V, VREF=(VDDA-VSS)/2=1.2, Chopper On

Max. Vin(mV) =0.9*VREF(1)	OSR					64	128	256	512	1024	2048	4096	8196	16384	32768	65536
	Output rate(Hz)					7813	3906	1953	977	488	244	122	61	31	15	8
	Gain	=	PGAGN	x	ADGN											
±2160	0.25	=	off	x	0.25	193.97	69.95	42.35	33.01	22.14	15.30	12.56	8.71	5.83	4.33	3.40
±2160	0.5	=	off	x	0.5	90.61	36.72	23.72	17.17	10.85	7.81	6.49	4.74	3.13	2.29	1.57
±1080	1	=	off	x	1	46.17	18.70	12.34	8.88	6.45	4.41	3.34	2.49	1.64	1.26	0.92
±540	2	=	off	x	2	24.74	10.93	7.34	5.28	3.59	2.75	2.29	1.44	0.97	0.77	0.52
±270	4	=	off	x	4	13.28	7.58	4.43	3.12	2.31	1.97	1.82	1.01	0.64	0.45	0.34
±135	8	=	off	x	8	8.31	6.27	3.00	2.44	1.85	1.75	1.54	0.80	0.42	0.30	0.21
±68	16	=	off	x	16	4.67	5.98	2.29	2.10	1.67	1.67	1.65	0.75	0.27	0.20	0.15

Figure 6-1

6.2. Quick Start ADC Analysis of Sensor

Step1: Follow the steps in section 4.6 to confirm that the hardware tool connection is connected correctly

Step2: According to the instructions in section 5.2.1.1, open hy17 ENOB software, and select "17M24 (4K)"chip to be analyzed.

Step3: According to the instructions in section 5.2.2, Confirm that the ENOB software and hardware tools are online

Step4: According to the instructions in section 5.2.3, Confirm that the ENOB software and chip's RAM & Register are synchronized.

Step5: According to the instructions in section 5.2.4, Clicks "ENOB Test" menu to open the "ENOB Analysis Window", set "Sample Point" and "Scale" and then press "Catch ADC" to start ADC performance analysis.

7. Revisions

The following describes the major changes made to the document, excluding the punctuation and font changes.

Version	Page	Date	Revision Summary
V01	All	2020/02/18	First edition