HY16F3981
IDE Hardware User's Manual

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1. Package Contents

HY16F3981 IDE Hardware development kit includes HY16F Mini Link and HY16F3981-L064 Target Board.

Integrated Hardware development kit helps to develop MCU application program of HY16F3981. Program compiling, hardware debug, IC programming was implemented through NB/PC end connection.
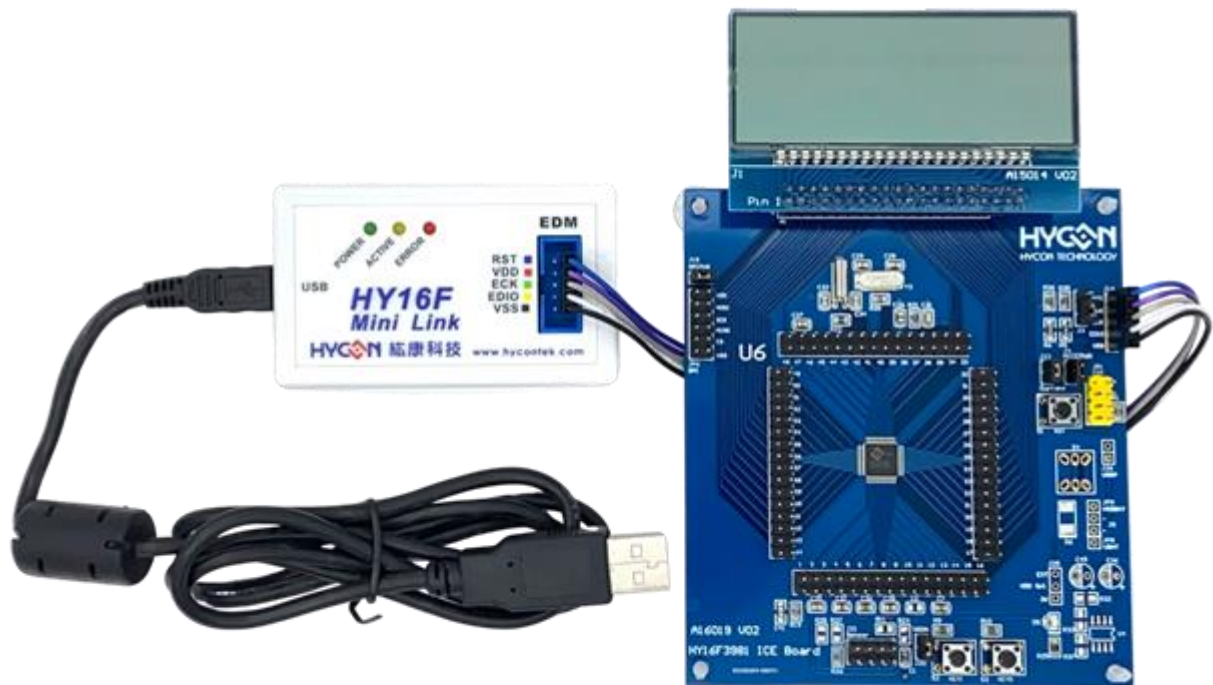
Serial number	Name	Spec	Quantity
HY16F3981-DK01	1. HY16F3981-L064 Target Board	HY16F3981-IM02	1
	2. HY16F Mini Link debug tool	HY16000-CM04	1
	3. USB cable	USB Type A to Mini B Cable	1
	4. EDM line	5pin to 4x2pin (2.54mm pitch)	1

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. IDE Software Installation Requirements

Minimum System Requirements of operating AndeSight RDS:

(1) PC/NB hardware requirement:

IBM PC compatible X86 system CPU

4GB Memory

8GB Hard disk

(2) Product number support:

HY16F3981

(3) Hardware model support:

HY16F3981 development tools, HY16F3981-DK02.

(4) Software version support:

AndeSight V2.3.1 RDSp3 version above

Device => HY16F_RDSp3_DeviceV0.1

Mini Link Version information => Andes AICE-MINI v1.0.1

(5) Operating system support:

Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10

(6) Apply the following interface modes:

USB Port
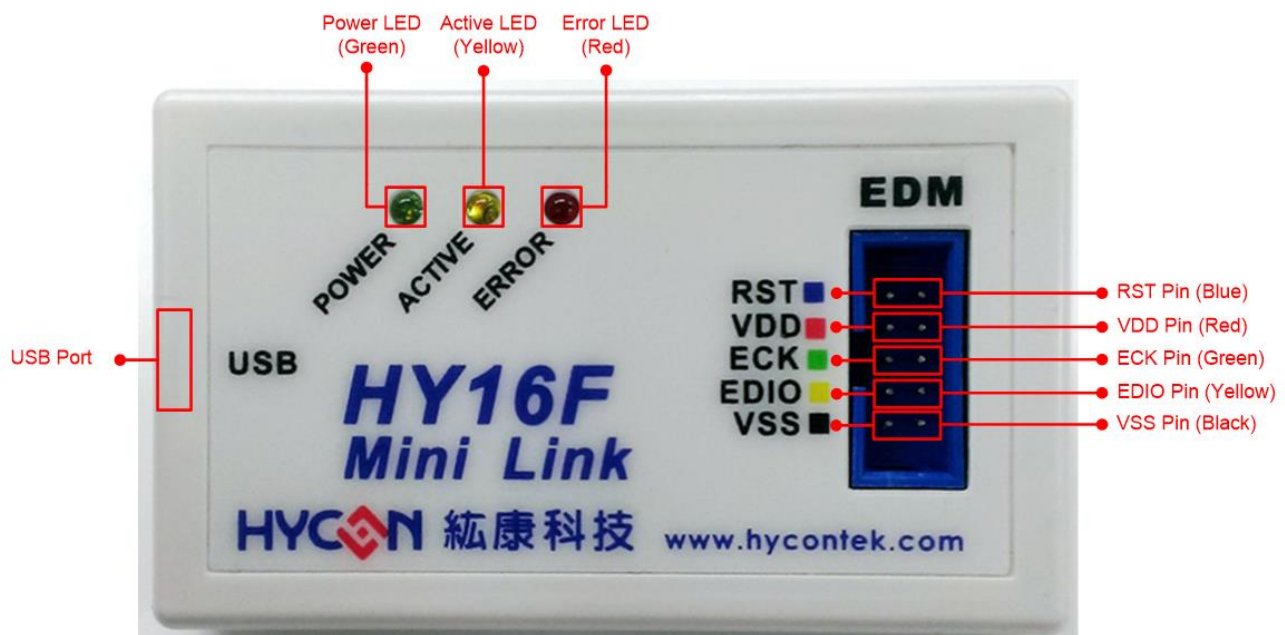
4. Description of the IDE hardware (HY16F Mini Link)

4.1. Schematic architecture description

HY16F Mini Link (AICE) for the HY16F3981-L064 Target Board and PC / NB end, the middle connection device. Mainly used as a Programming program and Debug mode.
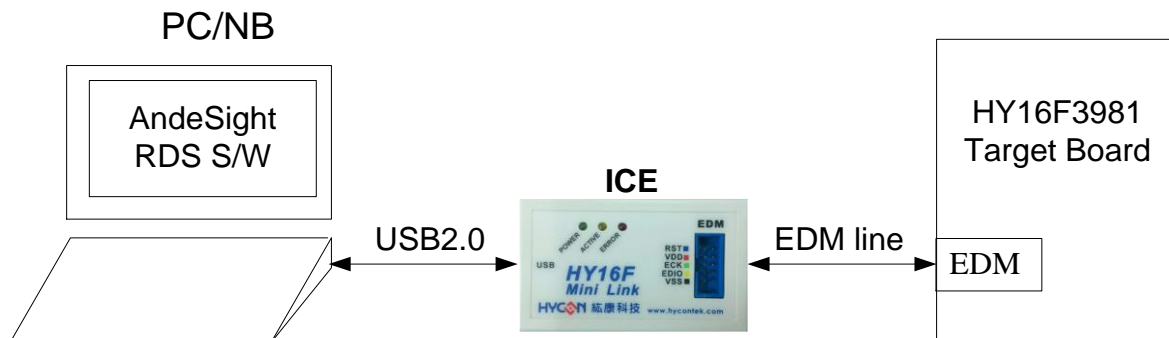
Note: EDM (Embedded debug module)

4.2. Mini Link diagram

| Pin Name	Description
RST	Reset Pin
VDD	The VDD pin of the Mini Link is fixed to provide 3.3V, And to provide IC (HY16F3981-L064) power directly from the Target Board EDM Pin7.
ECK	EDM Clock Pin
EDIO	EDM Data Input / Output Pin
VSS	Ground Pin

Mini Link LED Description:

● POWER LED (Green LED): When the USB Port connection, POWER LED will continue to light.

● ACTIVE LED (Yellow LED): When enter Debug Mode, ACTIVE LED will flash continuously.

● ERROR LED (Red LED): When the USB Port is connected but the Target Board is not connected, the Error LED is on.

4.3. Mini Link connection with EDM
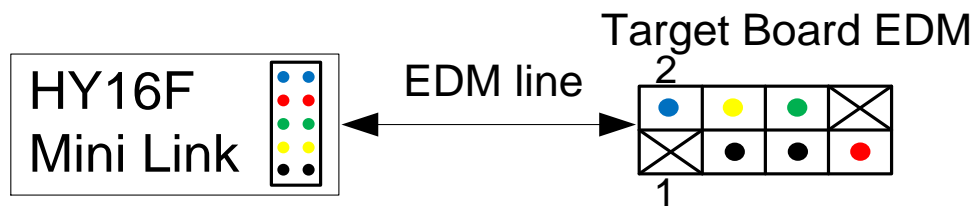
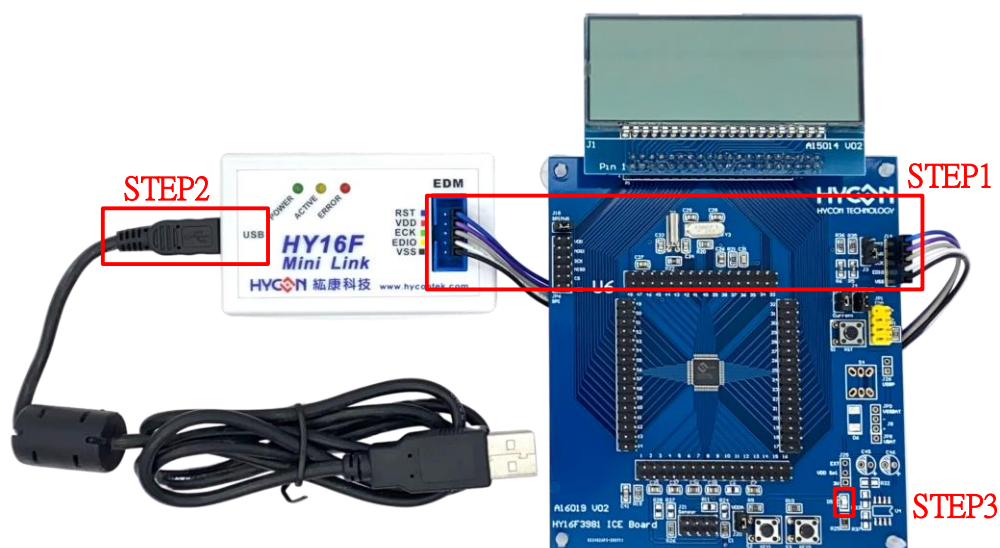● RST (Blue)-> Target board EDM Pin2
● VDD (Red)-> Target board EDM Pin7
● ECK(Green)-> Target board EDM Pin6
● EDIO(Yellow)-> Target board EDM Pin4
● VSS(Black)-> Target board EDM Pin3,5

4.4. Connection Diagram of Mini Link and Target Board (Powered by Mini Link)
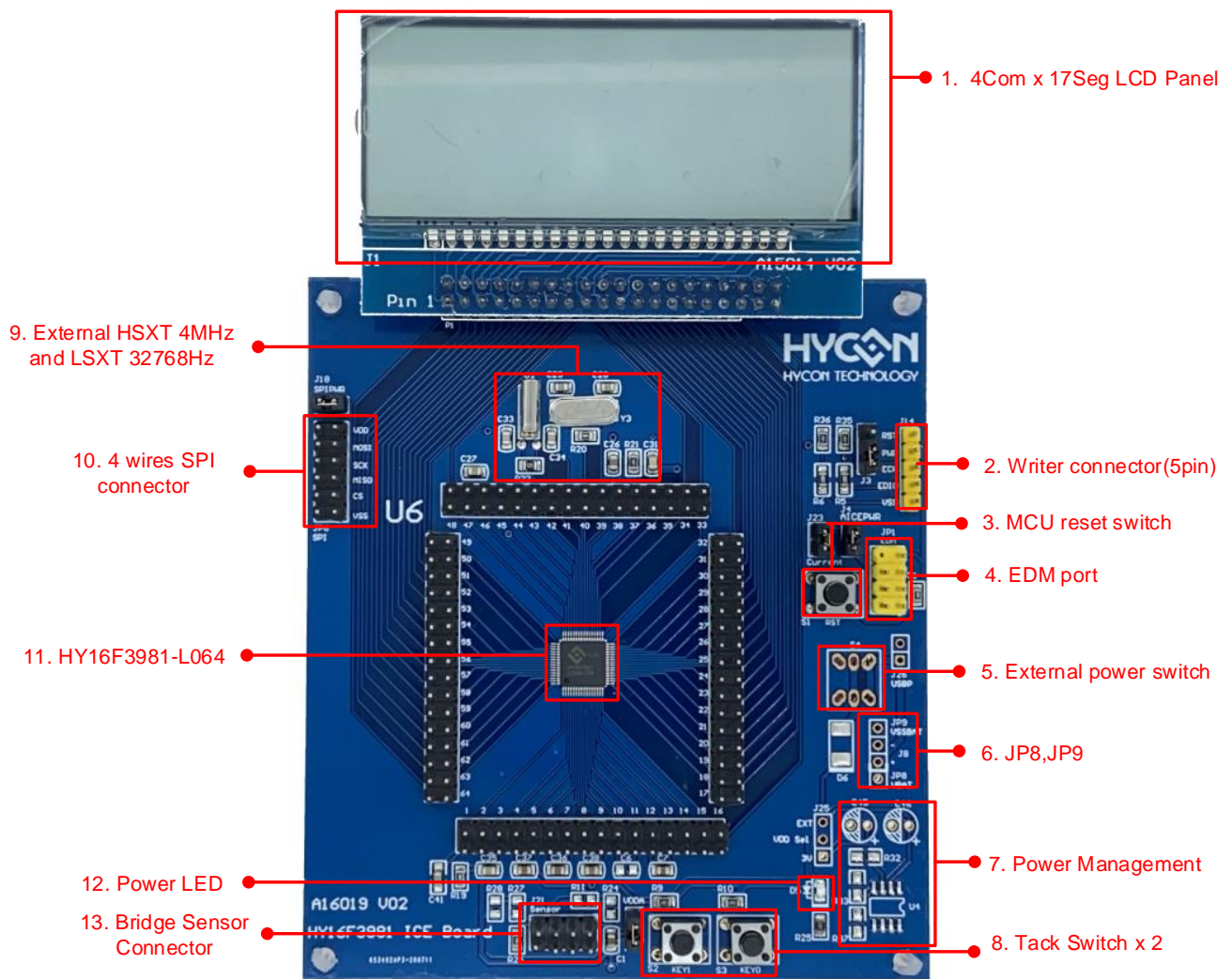
Step1: The EDM Line Connection Mini Link and Target Board.

Step2: Connect the PC's USB Port to the Mini Link.

Step3: The Power LED is on.

5. Hardware Target Board Introduction

1. 4Com x 17Seg LCD Panel
9. External HSXT 4MHz and LSXT 32768Hz
10. 4 wires SPI connector
11. HY16F3981-L064
12. Power LED
13. Bridge Sensor Connector
2. Writer connector(5pin)
3. MCU reset switch
4. EDM port
5. External power switch
6. JP8,JP9
7. Power Management
8. Tack Switch x 2

5.1. Target Board Features

No.	Name	Description
1	4Com*17Seg LCD Panel	See Chapter 6 for details
2	Writer connector	Programming IC use
3	MCU reset switch	Reset MCU is used
4	EDM Port	Connection Mini Link (See Section 4.3 ICE Connection for details)
5	External power switch	see section 5.2
6	JP8,JP9	External Power (see section 5.2)
7	Power Management	External power supply voltage regulator circuit (see section 5.2)
8	Tack Switch*2	S2 and S3 are Tack Switches

| 9	External HSXT and LSXT	External HSXT (4MHz) & LSXT (32768Hz)
10	4 wires SPI Connector	4 wires SPI Interface
11	HY16F3981-L064	HY16F3981 LQFP64 MCU
12	Power LED	When the Target Board is powered normally, the Power LED is on
13	Bridge Sensor Connector	ADC Input Pin AI0 & AI1

5.2. External Power Supply and Precautions

Use an external power supply method (Through the Power Management will power regulator into 3V, and then provided to HY16F3981 IC)

5.2.1. Use an external power supply step

Step1: Remove the EDM Line

Step2: By JP8 (+), JP9 (-) to provide external power supply.
    (Input range VDD~9.0V)

Step3: Press S4 switch (External power switch) Through the Power Management will power regulator into 3V, and then provided to HY16F3981 IC
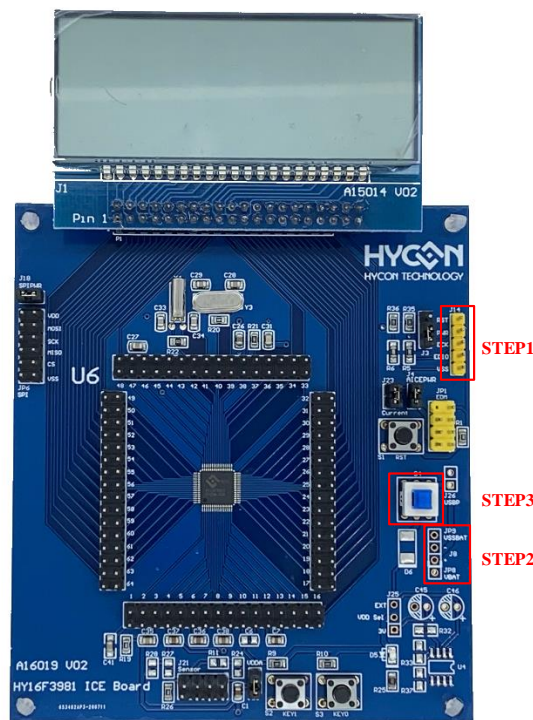
Precautions:

Because Mini Link supplied power = 3.3V, so when want to use an external power supply, be sure to remove EDM line, avoid voltage different voltages caused conflict.
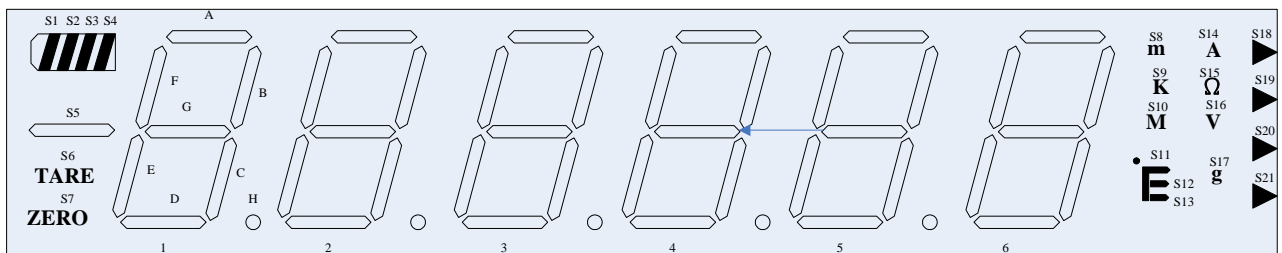
5.3. Target Board Circuit Diagram

6. LCD Board Introduction

The LCD panel on HY16F3981-L064 Target Board is HYCON self-owned mold, it's symbol and pin diagram is shown in below graph. It's panel specification is as follows:

(1) Operating Voltage: 3.0V
(2) Visible Angle: 60 degree
(3) Operating Frequency: 60Hz
(4) Bias:1/3 bias
(5) Waveform:1/4 duty
(6) Pin: 90 degree

	SEG0	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	SEG7	SEG8	SEG9	SEG10	SEG11	SEG12	SEG13	SEG14	SEG15	SEG16
COM0	1F	1A	2F	2A	3F	3A	4F	4A	5F	5A	6F	6A	S1	S5	S10	S9	S18
COM1	1G	1B	2G	2B	3G	3B	4G	4B	5G	5B	6G	6B	S2	S6	S11	S14	S19
COM2	1E	1C	2E	2C	3E	3C	4E	4C	5E	5C	6E	6C	S3	S7	S12	S15	S20
COM3	1D	1H	2D	2H	3D	3H	4D	4H	5D	5H	6D	S17	S4	S8	S13	S16	S21
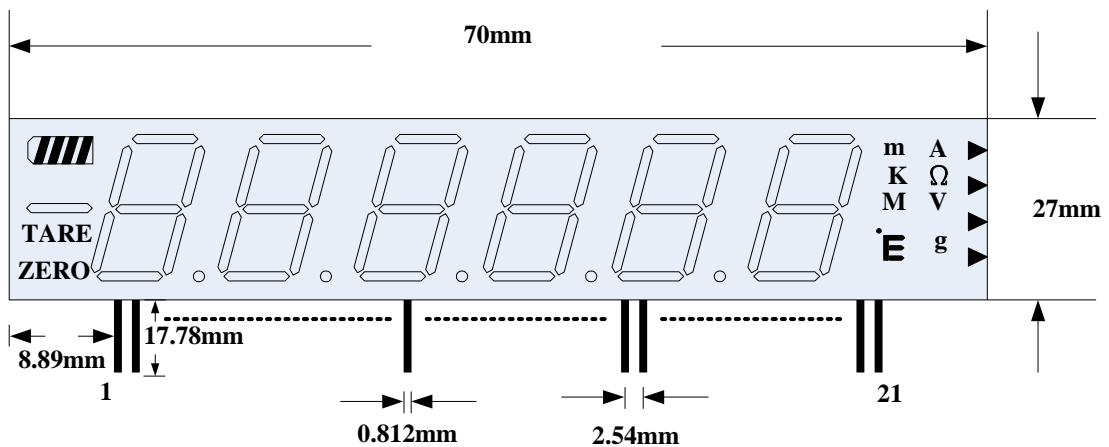
PIN	1	2	3	4	5	6	7	8	9	10	11
I/O	COM0	COM1	COM2	COM3	SEG0	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6
PIN	12	13	14	15	16	17	18	19	20	21	
I/O	SEG7	SEG8	SEG9	SEG10	SEG11	SEG12	SEG13	SEG14	SEG15	SEG16	

7. Hardware Connection Introduction

For driver install, please refer to HY16F Series, IDE Software User's Manual.

AICE USB driver program will install automatically when the software is installed.

For correct AICE connection status, libusb-win32 devices of AICE (which is Mini Link) will show up under PC device administrator.
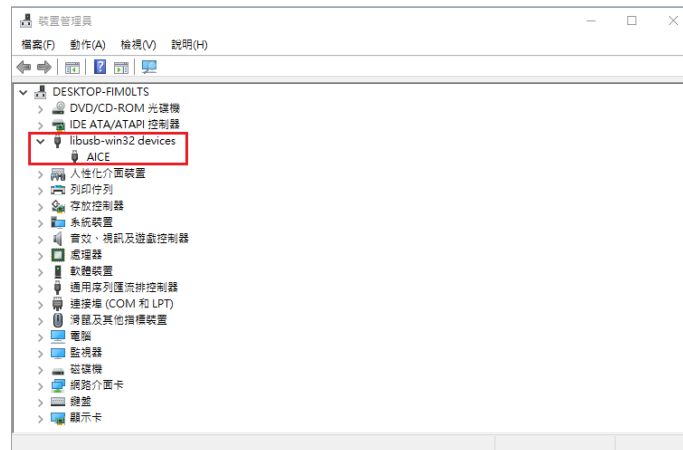
EDM connection test:

1. Connect the Mini Link to the Target Board according to Section 4.4

2. Open the AndeSight IDE software. (Please refer to installation HY16F series IDE software installation steps)

    (2.1) In the Target Manager: Local Targets window

    (2.2) Select HY16F3981 by right-clicking (Select Connect Target via AICE)

    (2.3) Successful connection appears HY16F3981 AICE: 9902

    (2.4) From the Console window, can see the version information of the Mini Link: Andes AICE-MINI v1.0.1
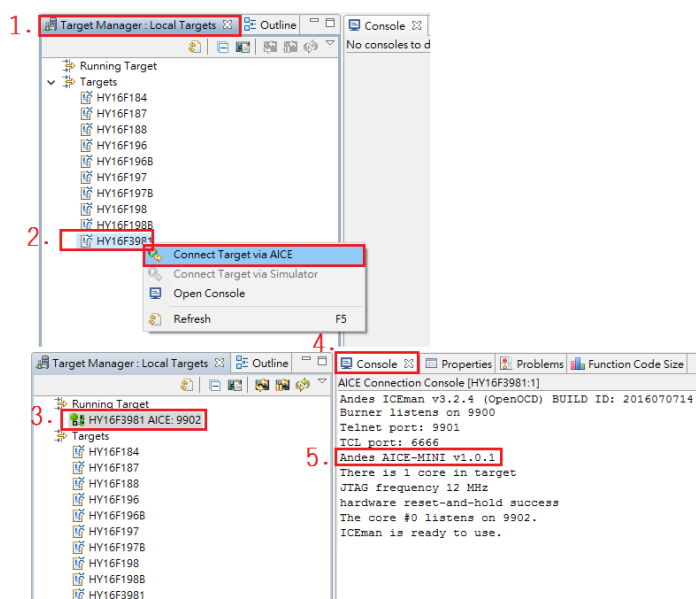
8. Revisions

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

Version	Page	Summary of Changes
V01	ALL	First Edition
V02	4,8~11	1. Modify the version of HY16F3981 ICE Board.
		2. Modify the version of the Target Board circuit diagram