

VG7050EAN
Evaluation Board Manual

VG7050EAN-EVB

SEIKO EPSON CORPORATION

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1. Overview

VG7050EAN-EVB is an evaluation board which customer can set target frequencies by writing registers' data of VG7050EAN. This manual describes evaluation board VG7050EAN-EVB's operation and accompanying software.

1.1. System Configuration

- Hardware : VG7050EAN Eva-Board (VG7050EAN-EVB)
- Software : VG7050EAN_ECN_RegWriter

1.2. Features

- VG7050EAN evaluation with registers setting by I²C bus
- Automatic register value calculation from inputted frequencies.
(Also user can set registers value directly.)
- Accompanying software (VG7050EAN_ECN_RegWriter)
Windows7, 8, 8.1 (32 bit, 64 bit) compatible
- Power supply (+2.5 V or +3.3 V) available through USB connection
- Easy PC connection through USB cable

1.3. Quick Start

- Install software (EV7050EAN_ECN_RegWriter) to PC
- Set jumper evaluation board (VG7050EAN-EVB) jumper pins
- Insert VG7050EAN on the socket
- Connect measurement instruments to VG7050EAN-EVB output terminals
- Connect PC and VG7050EAN-EVB with USB cable.
- Connect external level to Vc terminal (optional)
- Startup VG7050EAN_ECN_RegWriter
- Input target frequencies and transmit register data to VG7050EAN-EVB
- Evaluate target frequencies on the system.

1.4. VG7050EAN-EVB Block Diagram

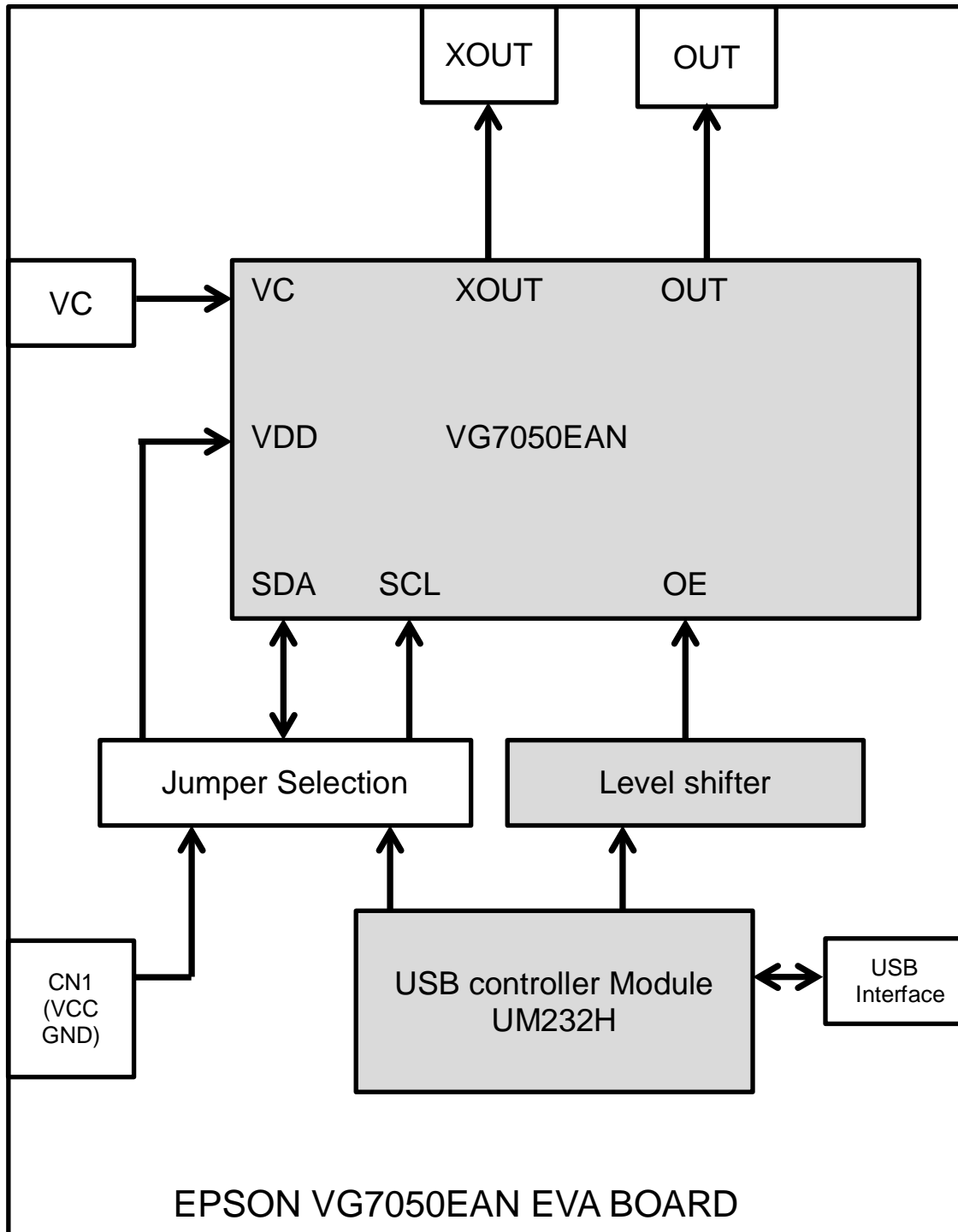


Figure 1 VG7050EAN-EVB Functional Block Diagram

2. Functional Description

VG7050EAN-EVB is an evaluation kits. Output frequencies are set by transmitting register data from PC to VG7050EAN-EVB through I²C bus.

2.1. Power Supply

Two power voltage supply ways (to VG7050EAN device on the boards) are available.

Way1 Through USB cable and regulator on board

Way2 Direct power supply from external unit

To select supply way, jumpers (JP7, JP8, and JP9) should be set.in the proper way.

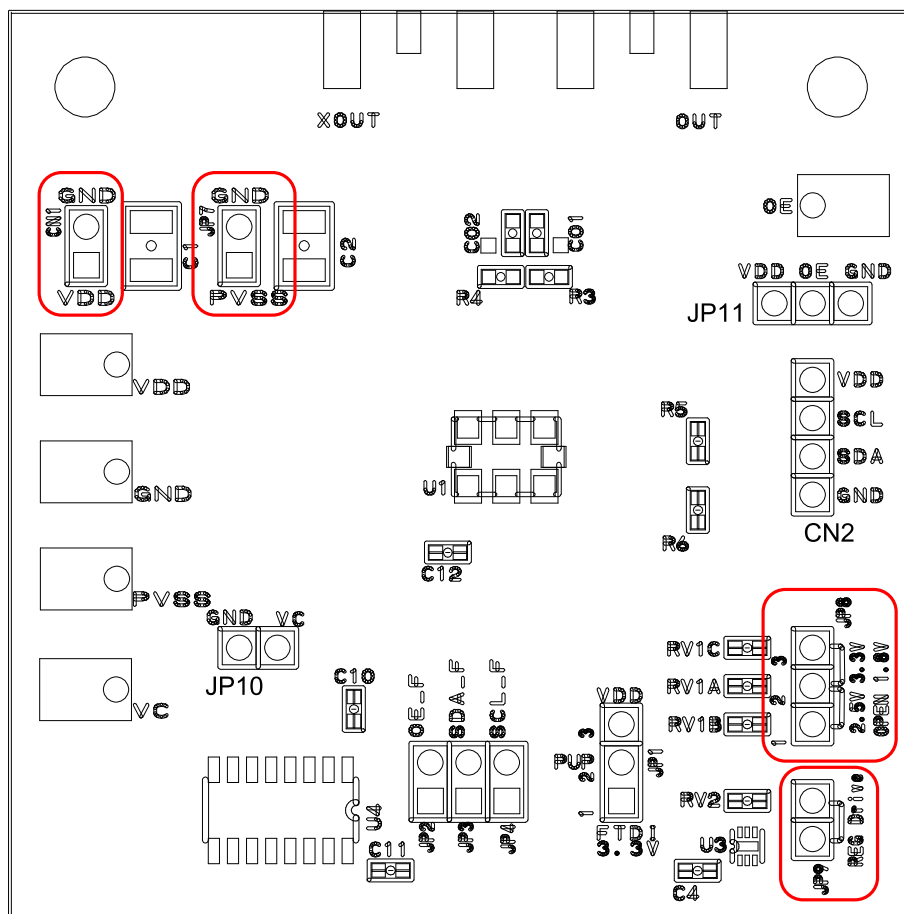


Figure 2 Jumpers for Power supply

Way1 Through USB cable and regulator on board

- JP7: short JP9:short
- JP8 1-2short:2.5V, 2-3short:3.3V

Way2 Direct power supply from external unit

- JP7: short
- JP9 :open
- CN1: power supply from external unit

Table1, 2, 3 describe detail power supply condition.

Table 1 VG7050EAN GND (PVSS) setting (JP7)

VG7050EAN GND terminal level (PVSS)	JP7 Jumper Installation
GND common	Short
GND separate	Open

Table 2 Regulator output level (through USB cable) (JP8)

Supply Voltage [V]	JP8 Jumper Installation
2.5	Connect pin 1 "2.5 V" to center pin 2
3.3	Connect pin 3 "3.3 V" to center pin 2

Table 3 VG7050EAN VDD power supply setting (JP9)

Power Supply Source	JP9 Jumper Installation
USB	Short
External Power supply	Open (External power supply is connected to CN1)

Caution: It is prohibited that external power supply connection to CN1 during JP9 short connection. If external power supply is connected to CN1 in case of JP9 short, power voltage collision might damage the circuitry on the board and PC.

2.2. Control by PC

Software (VG7050EAN_ECN_RegWriter) controls I²C I/F, OE on VG7050EAN-EVB. Table 4 describes the jumpers' function in connection with VG7050EAN_ECN_RegWriter.

Table 4 Jumpers setting

Jumper	Pin NO.	Signal name	Initial status
JP1 ^{*1}	3	SDA/SCL pull up level	1-2 Short (3.3 V)
JP2	2	OE	Short (Controlled by software)
JP3	2	SDA	
JP4	2	SCL	
JP7	2	VG7050EAN GND level	Short (Same as GND)
JP8	3	Regulator output voltage level (Through USB cable)	3-2 Short (3.3 V)
JP9	2	Power supply way	Short (Power from USB)
JP10	2	Vc terminal GND level	Open (GND separate)
JP11	3	OE terminal VDD/GND level	Open (VDD/GND separate)

*1 JP1 can stay in 1-2 short even VDD voltage drops from 3.3V to 2.5V.

2.3. Typical external measurement instruments connection

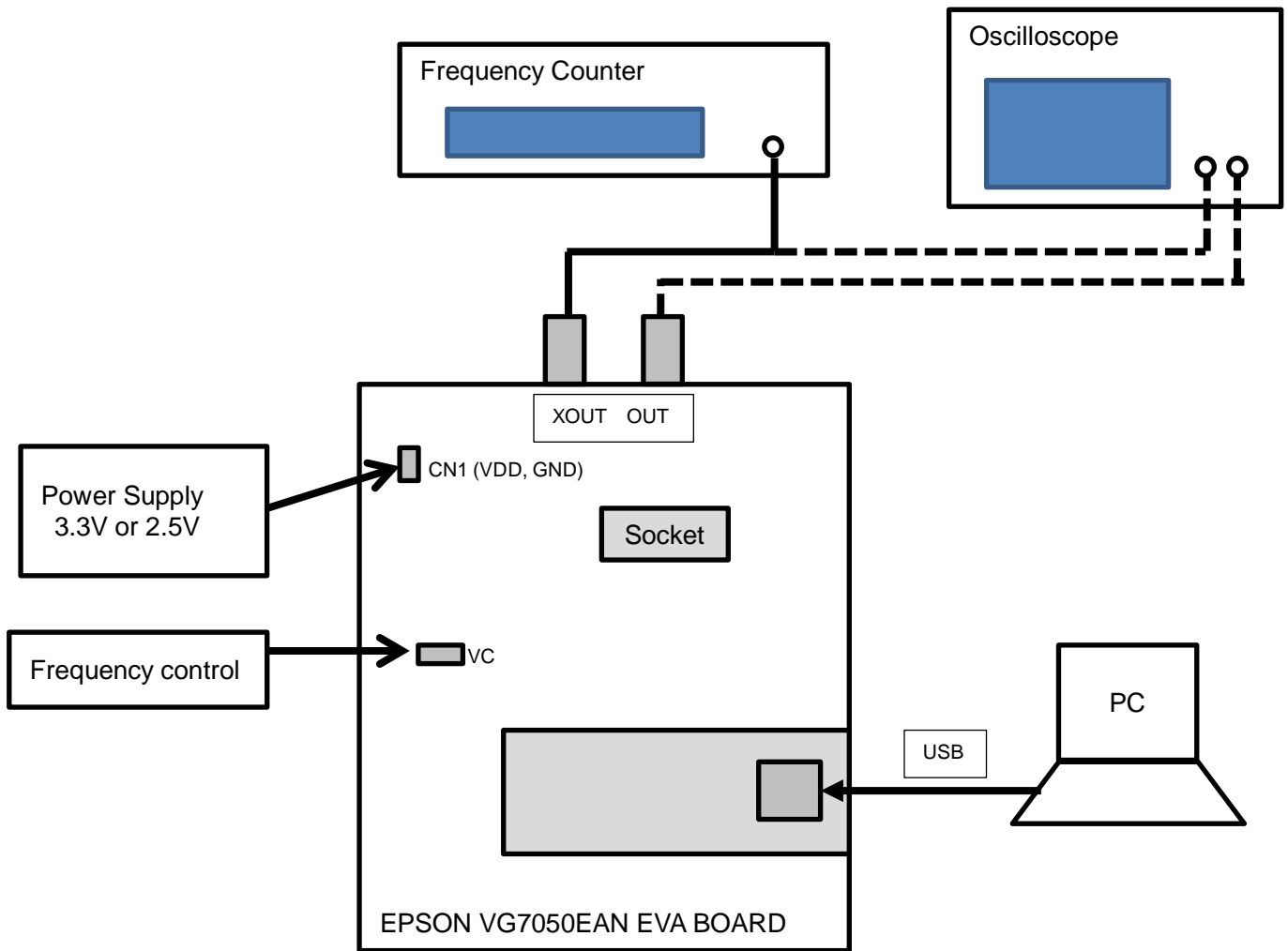


Figure 3 Typical measurement instruments connection

3. Board Configuration

3.1. Connection

Table 5 Power Supply

Power	Voltage	remarks
VDD	3.3 V or 2.5 V	Connected to VG7050EAN(socket mounted)'s VDD Connected to CN1 VDD
GND	0 V	Connected to CN1 GND

Table 6 Connectors, terminals, Socket

Connector, Terminal Socket	content	Remarks
CN1	VDD, GND	
VDD	VDD	
GND	GND	
CN2	I/F	
VC	VC	
OE	OE	
SMA1	VG7050EAN output (OUT)	
SMA2	VG7050EAN inverse output (XOUT)	
Mini-USB	USB	
U1	VG7050EAN socket	

3.2. Board layout

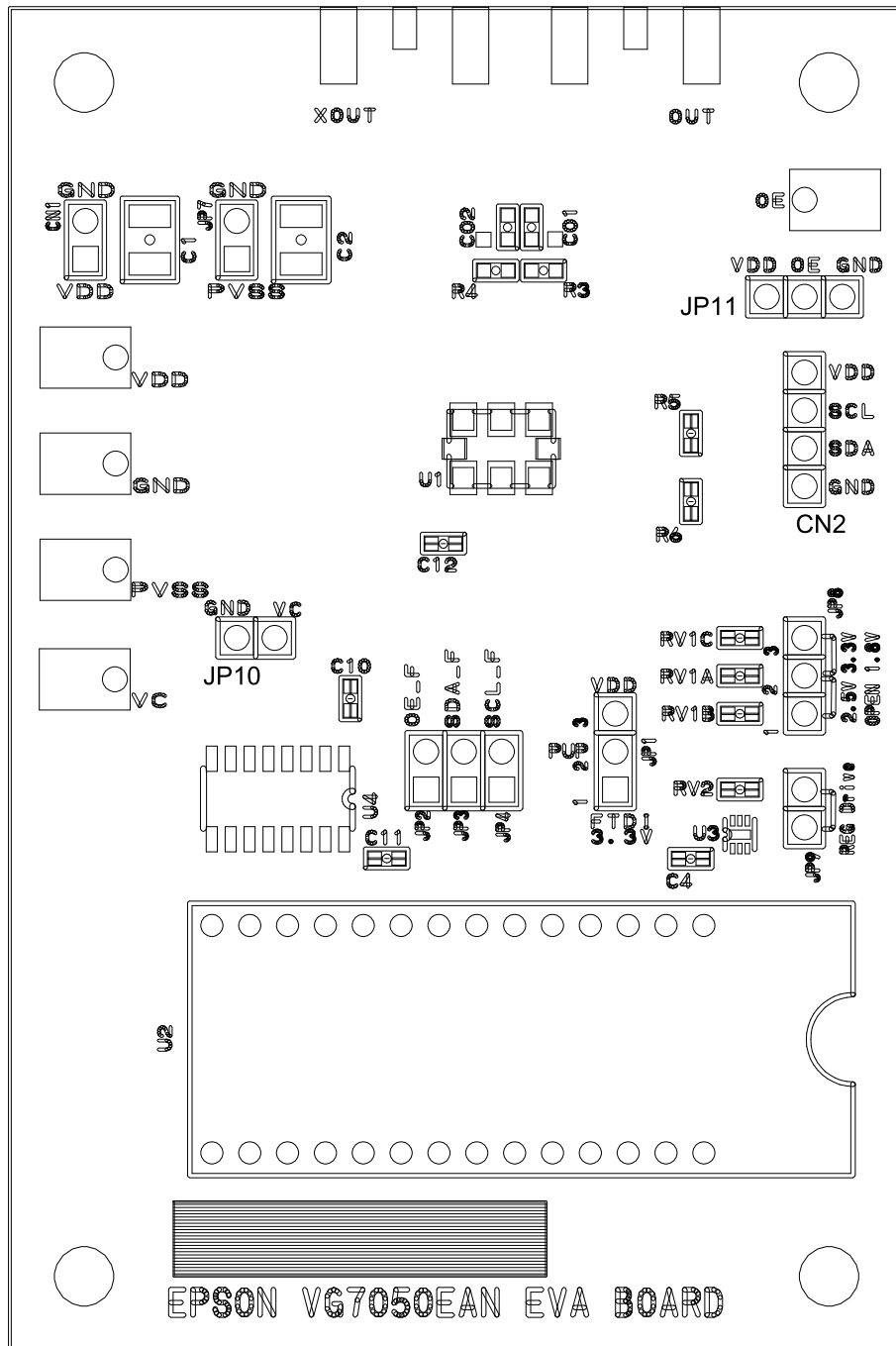


Figure 4 VG7050EAN-EVB Board layout

4. Software

Software (VG7050EAN_ECN_regWriter) should be installed into PC for VG7050EAN-EVB operation.

4.1. Required PC condition

- Microsoft Windows 7, 8, 8.1
- USB2.0
- HDD space 1MB
- 1024 x 768 screen resolution or greater
- Microsoft .NET Framework 3.5
- FTDI D2XX Direct Drivers

4.2. Turn Microsoft .NET Framework 3.5 ON

Microsoft .NET Framework 3.5 is required for VG7050EAN_ECN_RegWriter operation.

Microsoft .NET Framework 3.5 is installed in Windows 7 initially and set turn ON. But in case turned OFF, the check box should be ON at Windows Features. Customer can set by selecting PC control panel and program & function during internet on line.

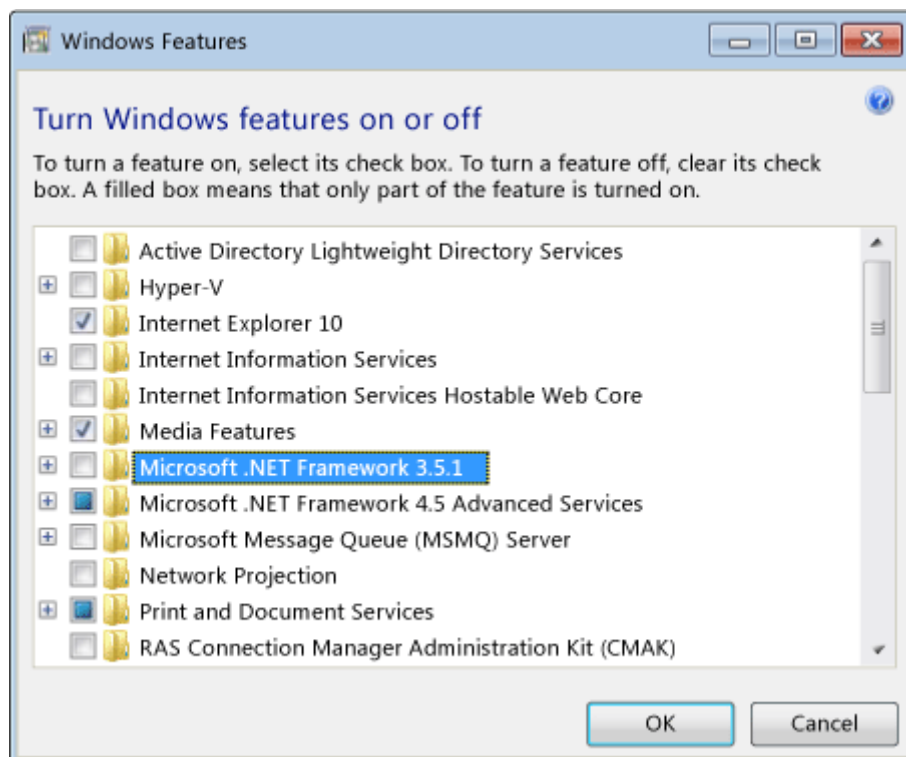


Figure 5 Microsoft .NET Framework 3.5 Turn ON (Windows 7)

In case of Windows 8/8.1, Microsoft .NET Framework 3.5 is installed initially, but set turn OFF. Two ways are available to turn ON Microsoft .NET Framework 3.5 during internet on line.

1. Installation of Microsoft .NET Framework 3.5 on demand
At initial starting time of VG7050EAN_ECN_RegWriter, next message box is shown. Click "Install this feature" for installation during internet on line.

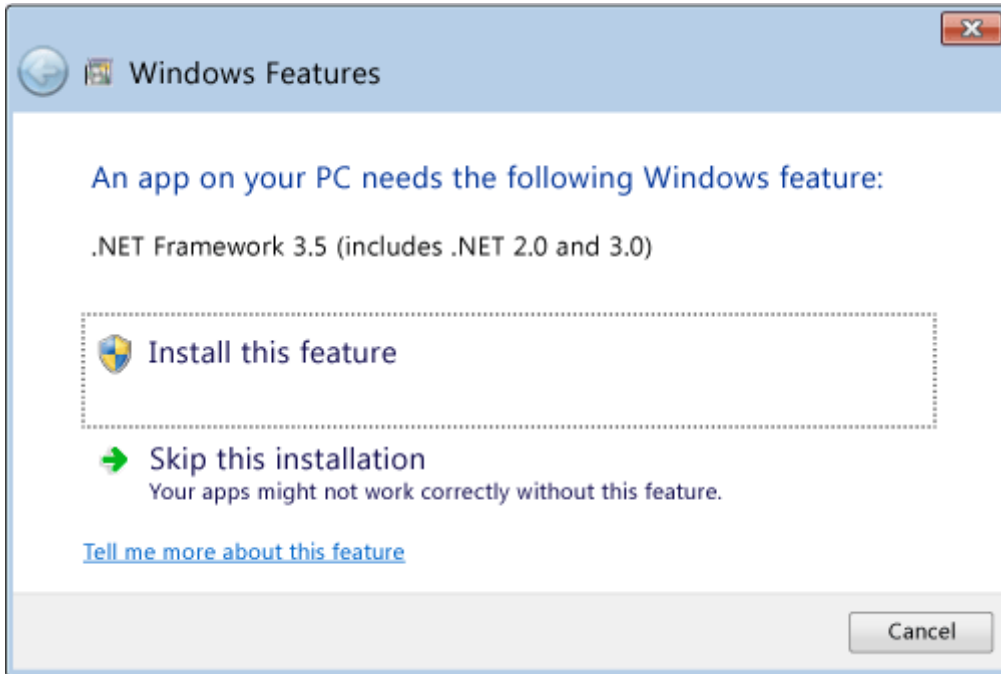


Figure 6 Microsoft .NET Framework 3.5 turn ON (Windows 8/8.1, on demand)

2. Microsoft .NET Framework 3.5 turn ON with PC control panel
Customer can set turn ON by selecting PC control panel and program & function during internet on line.

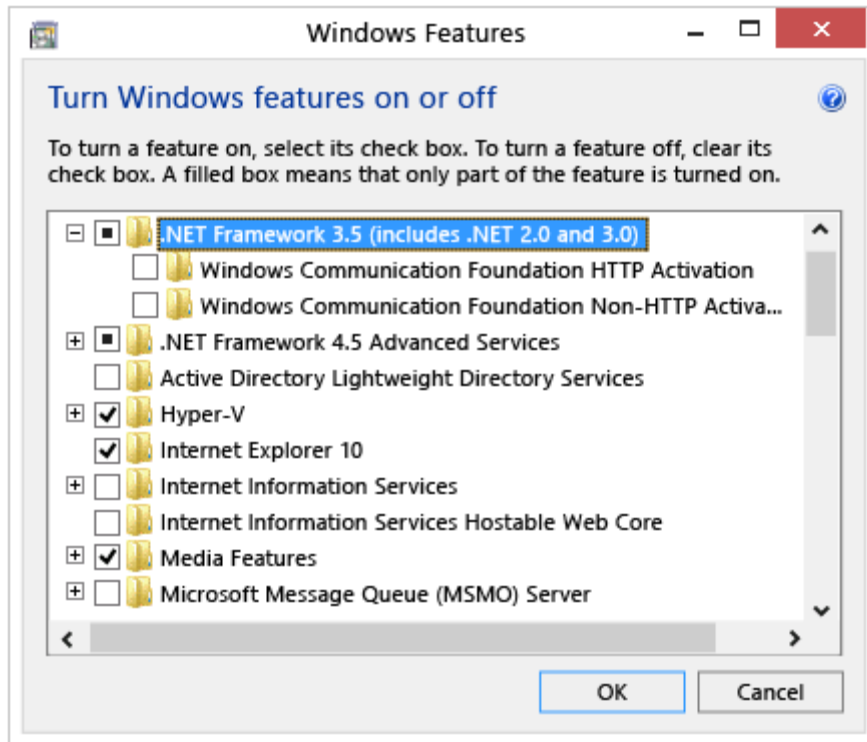


Figure 7 Microsoft .NET Framework 3.5 turn ON (Windows 8/8.1, Control Panel)

Please refer to Microsoft site Windows 8/8.1 [Microsoft site](#)

4.3. Installation FTDI D2XX Direct Drivers

An adequate device driver is automatically installed when VG7050EAN-EVB is connected to PC USB terminal during internet on line condition.

If automatic installation is not executed, customer can install device driver by FTDI setup executable.

1. Disconnect VG7050EAN-EVB from PC USB terminal.
2. Down load setup executable on FTDI WEB site [FTDI](#)
3. Click the right mouse button “setup executable” and “Run as administrator”.

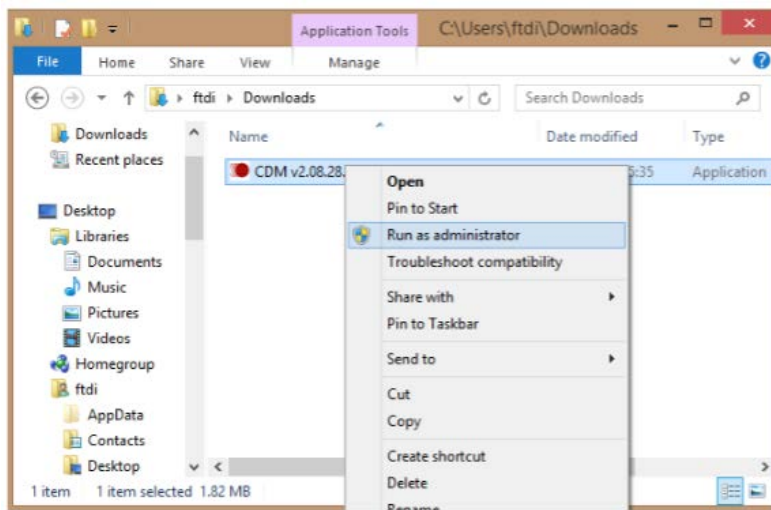


Figure 8 Execution FTDI setup executable

4.4. Installation VG7050EAN_ECN_RegWriter

Install software (VG7050EAN_ECN_RegWriter) to PC by installer (VG7050EAN_ECN_Installer.msi).

4.5. Setting frequencies and registers with VG7050EAN_ECN_RegWriter

Product selection

Select VG7050EAN with radio button.

Setting I²C slave address

Input I²C Slave Address with hex format. If it is unknown, press Search Addr button and found automatic search result.

Frequency setting

Input target frequency into Output Frequency column. Registers are calculated automatically.

Kv value selection

Select Kv value (0~11) on Kv column. If larger value (12~) is selected, Vc control function becomes inactive.

Registers' value writing and verification

Registers data is transmitted to VG7050EAN by pressing Write button.

Write and Verify button works register's data transmission and verifying between VG7050EAN_ECN_RegWriter and VG7050EAN device on the board. Result is shown in History column.

OE port control

OE port is controlled by radio button respectively.

Advanced operation

Register reading : VG7050EAN device registers data is transmitted and displayed on Register Read Table.

Frequency calculation from Register: By inputting Register value (hex code), customer can obtain frequency in Output Frequency column.

Reference frequency adjustment: Customer can change any reference frequency by selecting Advanced Mode from Tool pull down menu.

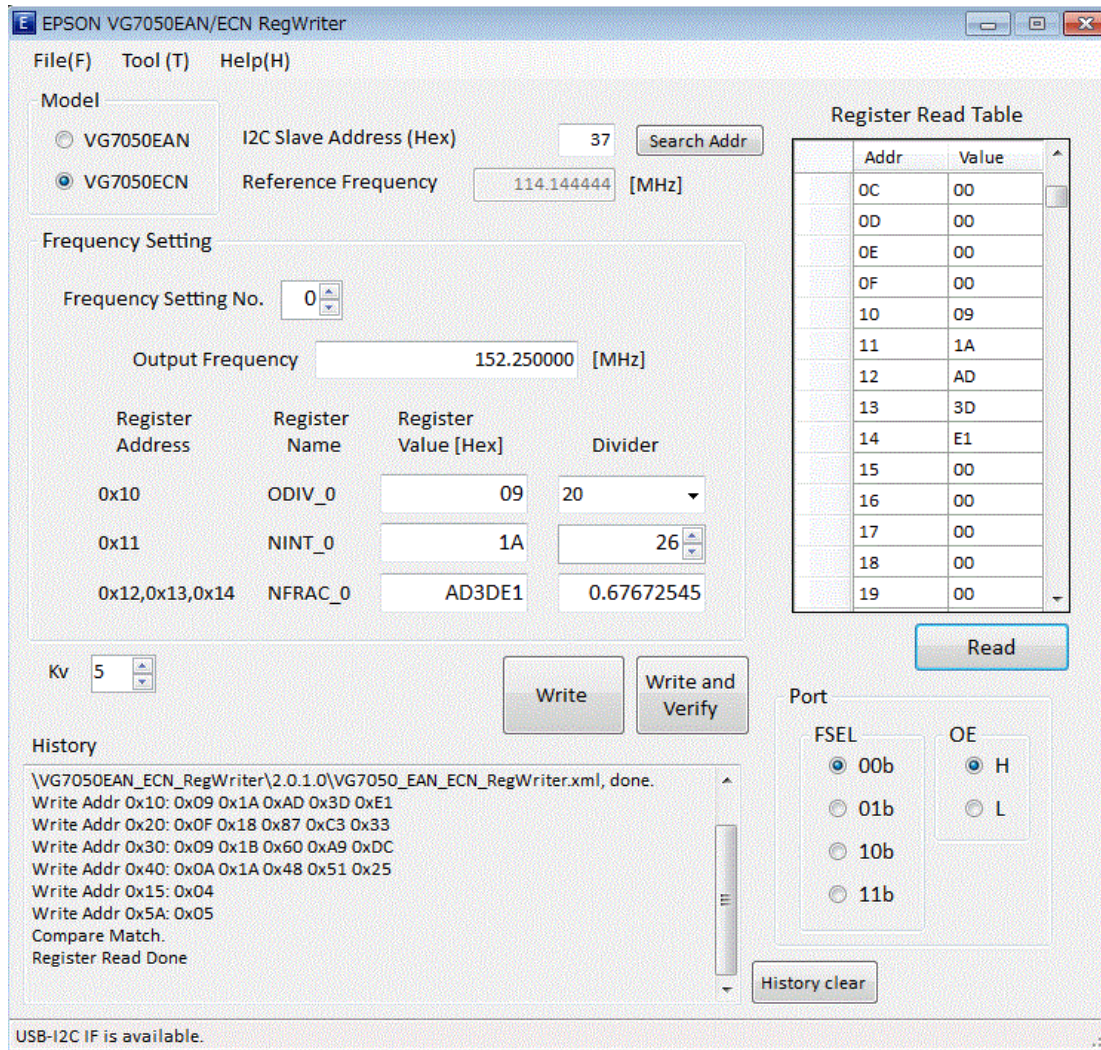
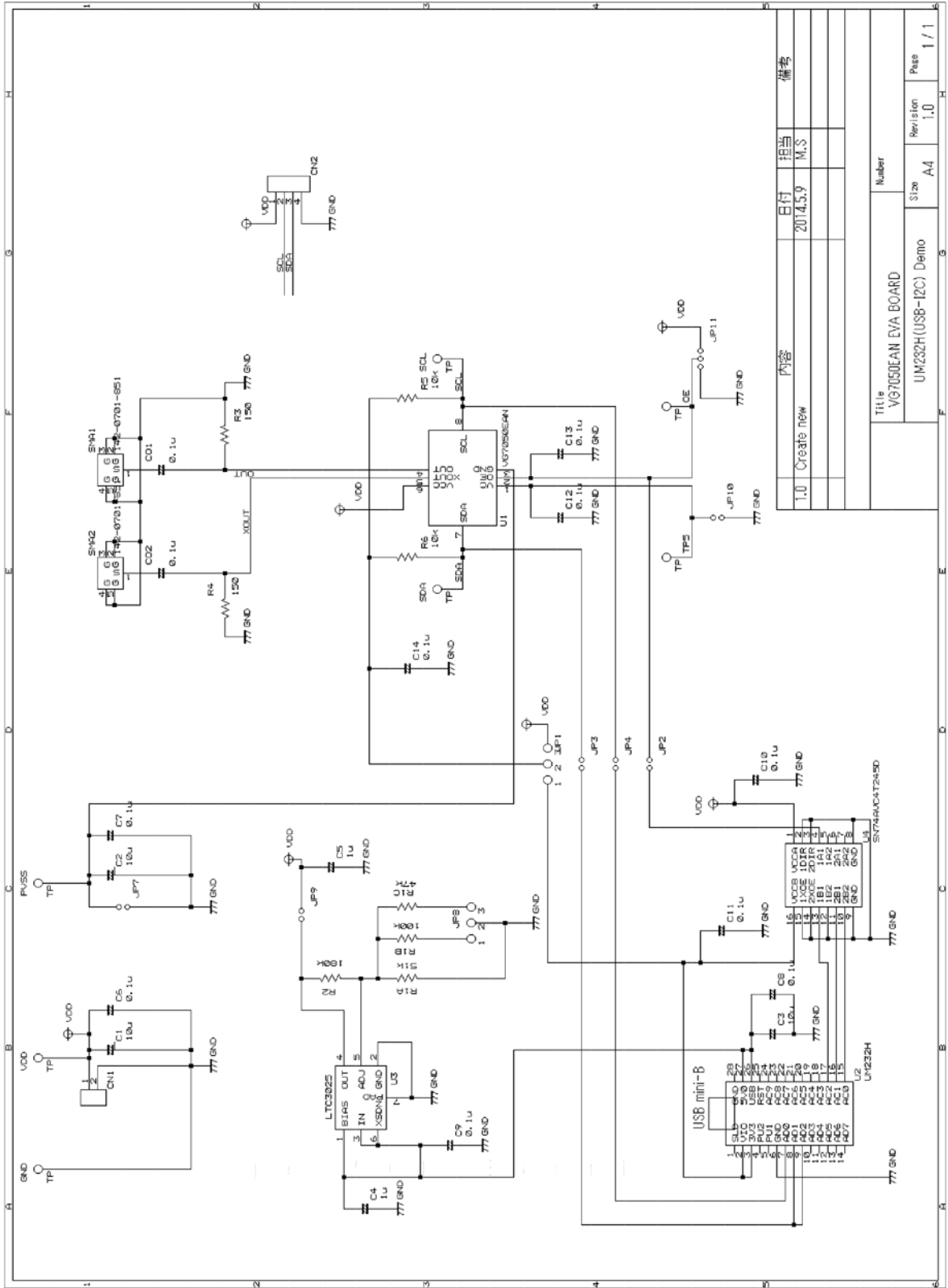


Figure 9 VG7050EAN_ECN_RegWriter operation panel

5. Schematic



1.0	Create New	内容	担当	備考
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VG7050EAN EVA BOARD		A4		1.0
UM232H(USB-12C) Demo		Size		

6. Bill of Materials

No	maker	device	code	instance	qty	specification
1	MURATA	capacitor	GRM32NF11E106Z	C1, C2, C3	3	3225, 10 μ F \pm 10%, DC10 V
2	MURATA	capacitor	GRM188B31E105K	C4, C5	2	1608, 1 μ F \pm 10%, DC10 V
3	MURATA	capacitor	GRM188B11E104K	C6, C7, C8, C9, C10, C11, C12, C13, C14, CO1, CO2	11	1608, 0.1 μ F \pm 10%, DC25 V
4	KOA	resistor	RK73H1JTDD5102F	R1A	1	1608, 51 k Ω \pm 1%
5	KOA	resistor	RK73H1JTDD1003F	R1B	1	1608, 100 k Ω \pm 1%
6	KOA	resistor	RK73H1JTDD4702F	R1C	1	1608, 47 k Ω \pm 1%
7	KOA	resistor	RK73H1JTDD1803F	R2	1	1608, 180 k Ω \pm 1%
8	KOA	resistor	RK73H1JTDD1500F	R3, R4	2	1608, 150 Ω \pm 1%
9	KOA	resistor	RK73H1JTDD1002F	R5, R6	2	1608, 10 k Ω \pm 1%
10	Emerson Network Power Connectivity Solutions	SMA	142-0701-851	SMA1, SMA2	2	-
11	MiS Technologies	Socket	CXP-A08-11-00	U1	1	-
12	Linear Technology	regulator	LTC3025	U3	1	2 mm x 2 mm, DFN
13	Texas Instruments	Level shifter	SN74AVC4T245D	U4	1	SOP
14	MAC8	Wrapping terminal	WL-1	CN1, CN2, JP1, JP2, JP3, JP4 TP (SDA, SCL)	-	-
15	MAC8	Check pin	LC-22-G- red	VDD	1	red
16	MAC8	Check pin	LC-22-G-yellow	PVSS, OE, VC	3	yellow
17	MAC8	Check pin	LC-22-G-black	TP_GND	1	black
18	FTDI	FTDI module	UM232H	U2	1	-
19	RS	spacer	325-659	-	4	M3 x 12.7 mm nylon

7. Caution

It is prohibited that external power supply connection to CN1 during JP9 short connection. If external power supply is connected to CN1 in case of JP9 short, power voltage collision might damage the circuitry on the board and PC.

Evaluation Board Manual

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