

Specification	
Issued Data	
Revision	

Specification

Fine Resolution CCD Camera

VCC-880A

Approved	Approved	Checked	Issued

CIS Corporation

1. Object

This specification describes UXGA Format Double Speed CCD B/W camera, VCC-880A. The object described here is carefully assembled with well-selected materials and parts and properly adjusted in order to meet the expected performance defined in this specification.

2. Notice

The camera must not be used for any machines such as atomic and/or aerospace purposes which may damage and lose human life by its defect or trouble.

The interface connector applied to this camera is 12P EIAJ standard, however, please secure to check the connection. Any damage and/or defect due to mis-connection are not guaranteed.

Refer to Clause 11. Handling Notice for detail.

3. Outline

This is a high resolution B/W camera applying 1/1.8" optical, 2.0M of effective picture elements, square pixel, B/W interline CCD image sensor with micro lens and realizes high sensitivity, less distortion and clear image.

The camera has many functions as external sync, external trigger, variable electric shutter, gain control, gamma selection etc. and is compact and lightweight image sensor for FA applications as Image Sensing and Measurement and Image Capture.

The frame rate is 12.480 frames per second or 80.128msec. The external sync and variable electric shutter functions enable to take capturing image at certain timing with minimum time. The external trigger system is One Pulse One Trigger Type by V Sync Reset.

4. Construction

4-1. Standard Construction

Camera

4-2. Packing Style

Individual Carton

Master Carton containing 20 units (It may change by shipping quantity accordingly)

5. Specification

5-1 . General Specification

Item	Specification	Remarks
Power Consumptions	3.7W max.	
Power Requirements	DC+12V \pm 10% must not exceed 13.5V	
Operating Temperature	Performance Guaranteed; 0 to +40 ° with moisture of 20 to 80% Operation Guaranteed; -5 to +45 ° with moisture of 20 to 80% Note: No dewing is allowed.	
Storage Temperature	-25 to +60 ° with moisture of 20 to 80% Note: No dewing is allowed.	
Weight	Approximately 140 g	
Overall Dimension	Refer to the outline drawing	
External Sync. System	HD/VD HD/External Trigger External Trigger	
Video Output	VS 1Vpp Sync signal negative	75 ohm at termination at normal output
Video Out Effective Range	Horizontal range: 53.33micro sec (1600 CLK) Vertical range: 1200 lines	At normal output
Sync signal In/Out	At Internal Sync Mode HD Output: 18.750 KHz VD output: 14.976 Hz	
	At External Sync Mode HD Input: 15625 KHz +/- 1% VD Input: At normal reset mode: 12.480 Hz (1252 H) with continuous VD input At direct reset mode: single or 12.480 Hz or less with discontinuous VD input	75 ohm at termination ON/OFF
	At External Trigger Mode HD Output: 15.625 KHz +/- 1% at INT mode VD output: Output effective frames only at INT mode WEN output: Output effective frames only (Negative Pole) External Trigger Input: Minimum pulse width (2H) (available to input at pos./neg. both poles)	75 ohm at termination On/OFF 75 ohm output 75 ohm output TTL
Pick Up Device	1/1.8" optical, square pixel, CCD image sensor Effective picture elements : 1628 (H) \times 1236 (V) ICX274AL	
Pick Up System	One CCD	
Lens Mount	C Mount	
Horizontal Resolution	Approx. 1200TV line	

Minimum Illumination	0.2 Lx (F1.4 AGC Max Gain, w/o IR cut filter, Gamma 1.0)	Illumination at 50% of signal level
Sensitivity	2000 Lx, F 16 or more at exposure with 1/12 sec	
Mode Selection	Gain Control 0 dB/ manual gain control available	SW1-1
	Gamma Select Gamma = 0.45 or similar/1.0 selectable	SW1-2
	HD/VD Termination 75 ohm at termination/open	SW1-3
	Ext. Trigger Polarity Positive/Negative selectable	SW1-4
	Sync Mode Internal Sync Mode Normal SW1-5 to 8 HR High Frame Rate Scan ON External Sync Mode Normal Reset Direct Reset External Trigger Mode Random Trigger Mode 1_INT Random Trigger Mode 2_INT Random Trigger Mode 1_EXT Random Trigger Mode 2_EXT Random Trigger Mode 1_INT_HR Random Trigger Mode 2_INT_HR Random Trigger Mode 1_EXT_HR Random Trigger Mode 2_EXT_HR	
Electric Shutter	Available to set High Speed Shutter at Internal Sync Mode, External Sync Mode (Normal Reset Mode) and External Trigger Mode (Random Trigger Mode 1)	SW2

5-2. Camera Signal Specification

Item	Specification	Remarks
White Clip	840 mVpp + 40 mV, - 50mV	At 75 ohm termination
Set Up	28 mV ± 15 mV, -10mV (=1.0) 28 mV ± 35mV, -10mV (=0.45)	At 75 ohm termination
Sync Level	280 mV ± 30 mV	At 75 ohm termination
VS Output DC Level	+ 450 mV ± 50 mV (Sync chip level) DC direct output	
Scan Frequency	Horizontal Frequency : 15.625 KHz Frame Frequency : 14.480Hz	
Pixel Clock Frequency	30.000MHz +/- 50ppm	
Output Sync Signal	HD Output : + 3.0V or more (Negative) VD Output : + 3.0V or more (Negative)	At open At open
Warming Up	To be ready within 3 sec after switch ON	
Gain Control	OFF : 0dB ON : Within 0dB to + 12 dB (manual gain)	SW1-1 VR1
Electric Shutter	OFF (1/12), 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 Available at Internal Sync Mode, External Sync Mode (Normal Reset Mode) and External Trigger Mode (Random Trigger Mode 1)	SW2
Gamma Selection	OFF : 1.0 ON : 0.45 or similar	SW1-2
H Phase Adjustment at External Sync	16 steps with 35nsec/step for forward and delay to External HD input	Shassis Inside SW1
Aperture Compensation	OFF: Aperture OFF ON : Aperture ON	Shassis Inside SW2-8

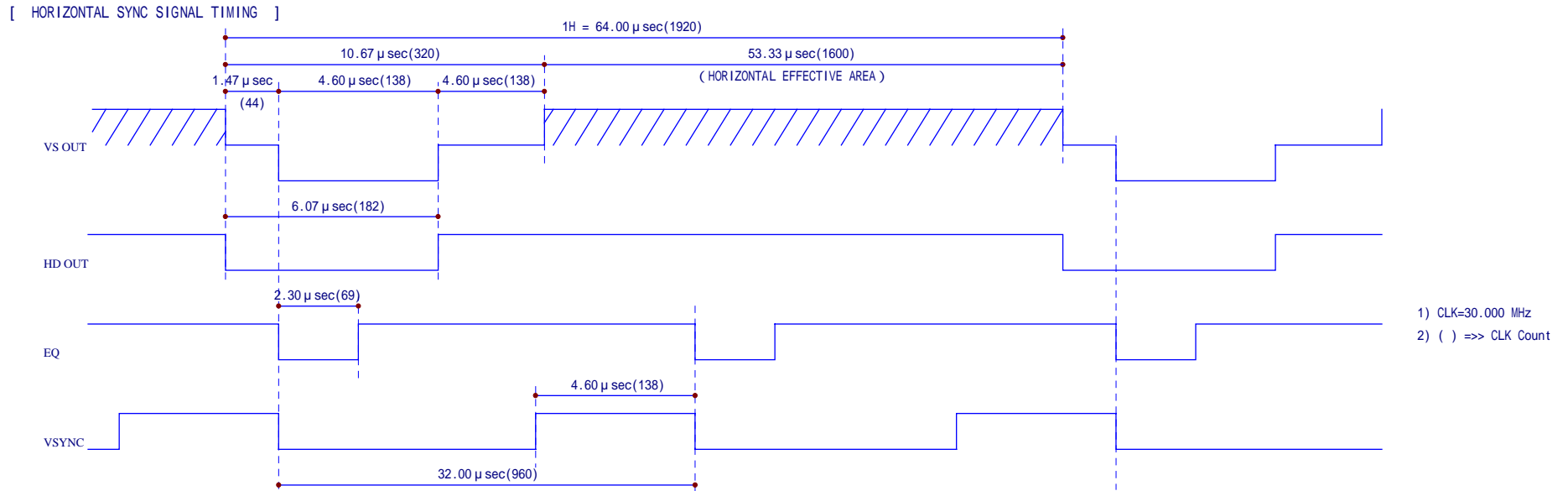
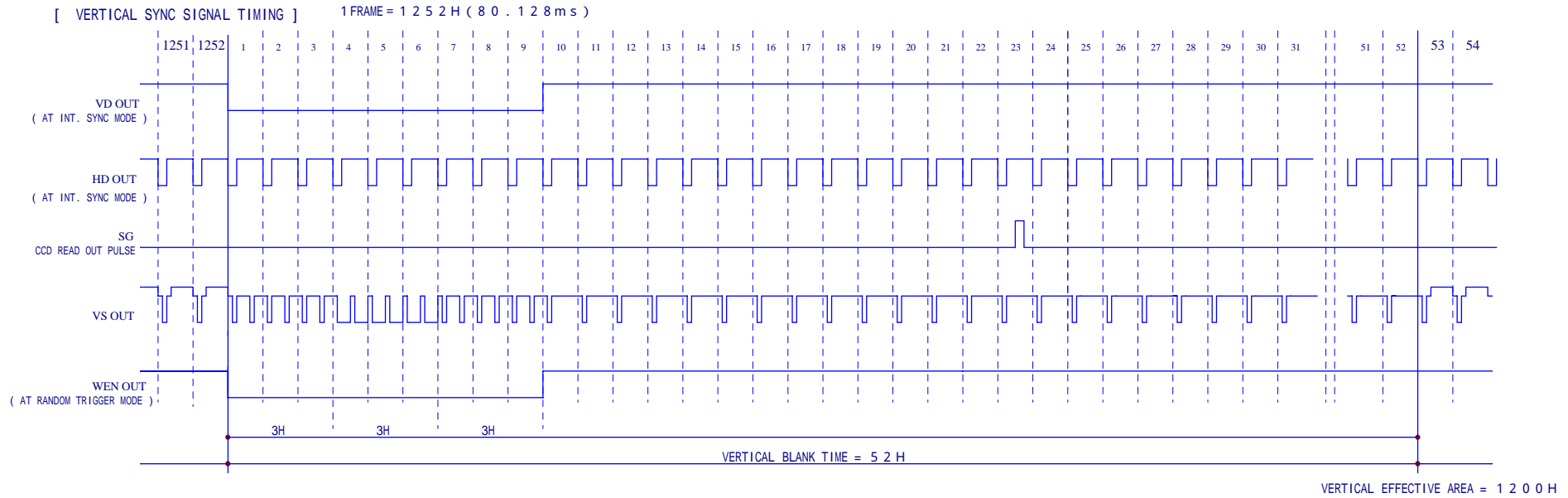
5-3. Standard

Item	Specification	Remarks
Operating Temperature region	a). After one hour setting at maximum operation temperature (without dewing), camera has correct performance. b). After one hour setting at minimum operation temperature (without dewing), camera has correct performance.	Operating Temperature region
Standard	Based on UL standard (materials and others) CE Marking EN61000-6-2 EN55022(Class B)	Standard

5-4. Durability

Item	Specification	Remarks
Vibration	Acceleration 7.0G Frequency 11 ~ 200Hz Sweep interval 300seconds Direction XYZ 3 directions Test time Each direction 10min. After above testing, there are no problem.	
Shock (Impact)	After shocking 50G after XYZ direction on no packing condition, there are no problem.	

VCC - 880A SYNC SIGNAL TIMING



VCC-880A SYNC SIGNAL TIMI

5-5. External Sync Mode

(1) External Sync Mode (Normal Reset Mode)

Signal is output with synchronizing to continuous VD (1 frame = 1252 lines) from outside. Use Direct Remote Mode when VD is not 1252 lines. Internal clock is oscillates with LC at External Sync Mode.

Item	Specification	Remarks
Input Sync Signal Width	HD Input : + 2V to + 5V (Negative)	TTL
	VD Input : + 2V to + 5V (Negative)	TTL
Input Sync Frequency Limitation	HD input : 15.625KHz +/- 1.0% VD input : 12.480Hz (fv = fn/1252) Lock within the above frequency range.	

Item	Specification				Remarks
	SW1-5	SW1-6	SW1-7	SW1-8	
Switch	OFF	ON	ON	ON	

Refer to the “Normal Reset Mode” at External Sync timing Chart.

(2) External Sync Mode (Direct Reset Mode)

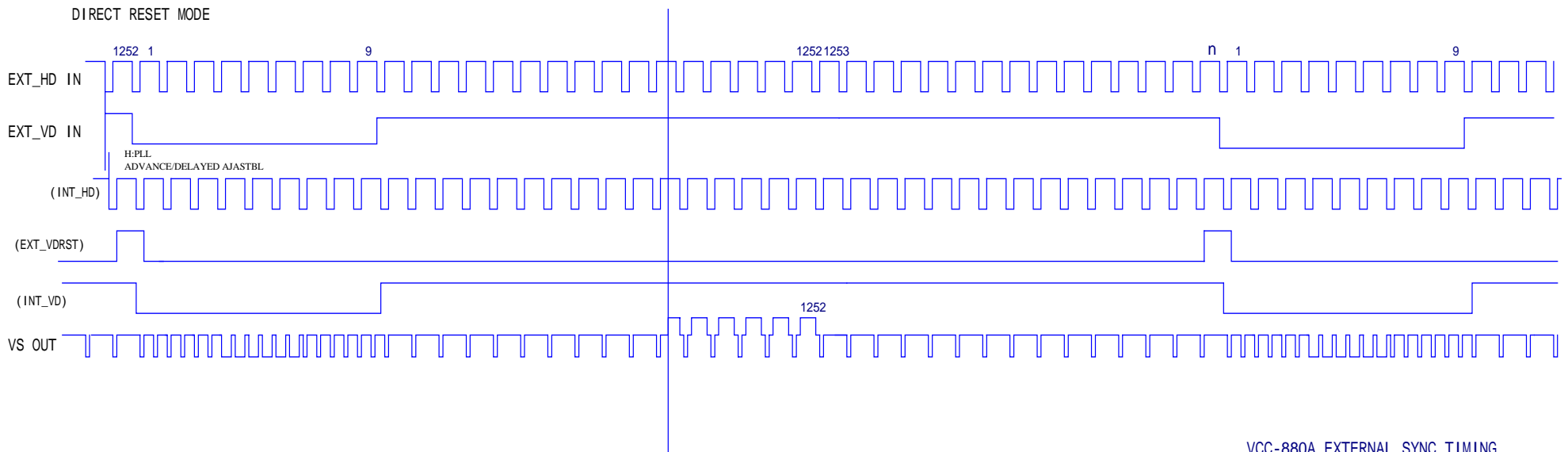
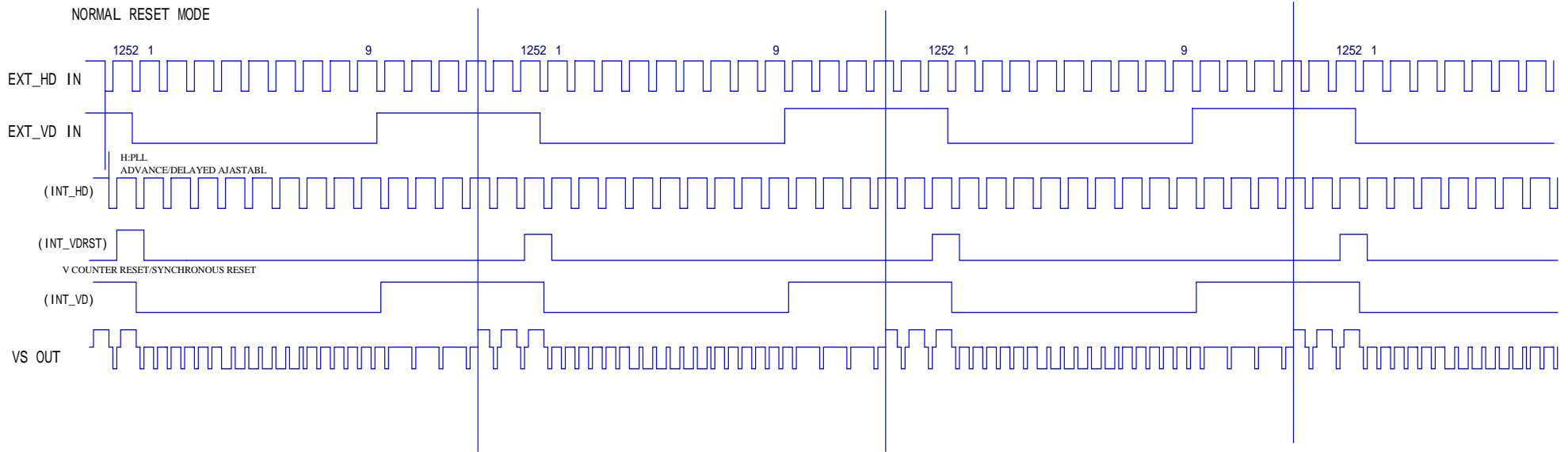
Signal is output with synchronizing to discontinuous or single VD (1 frame = 1252 lines or more) from outside. Internal clock is oscillates with LC at External Sync Mode.

Item	Specification	Remarks
Input Sync Signal Width	HD Input : + 2V to + 5V (Negative)	TTL
	VD Input : + 2V to + 5V (Negative)	TTL
Input Sync Frequency Limitation	HD input : 15.625KHz +/- 1.0% VD input : Single or discontinuous VD with 12.480Hz Lock within the above frequency range.	

Item	Specification				Remarks
	SW1-5	SW1-6	SW1-7	SW1-8	
Switch	ON	OFF	ON	ON	

Refer to the “Direct Reset Mode” at External Sync Timing Chart.

VCC - 880 A EXTERNAL SYNC TIMING



VCC-880A EXTERNAL SYNC TIMING

5-6. External Trigger Mode

(3) Random Trigger Mode 1 (INT/EXT)

Signal for one frame is output with synchronizing to trigger from outside and the accumulation time starts at trigger up (positive input) or trigger down (negative input). The shutter speed is set with dipswitch on the camera (SW2). Trigger re-input during trigger prohibition period is neglected. Internal clock is oscillates with LC at External Sync Mode. HD input is not necessary at INT Mode.

Item	Specification	Remarks
Input Sync Signal Width	HD Input : + 2V to + 5V (Negative)	TTL at EXT
Input Sync Frequency Limitation	HD input : 15625KHz +/- 1.0%	At EXT
Trigger Signal Width	Trigger Input : + 2V to + 5V Polarity selectable	TTL
Trigger Signal Pulse	128.0 micro sec (2H) or more	
Output Sync Signal	VD Output : + 3.0V or more (Negative) Only effective frame is output at INT	At open
Effective Frame Signal	WEN Output : + 3.0V or more (Negative)	At open

SW1-4	OFF	ON	Remarks
Trigger Polarity	Positive	Negative	

Item	Specification				Remarks
	SW1-5	SW1-6	SW1-7	SW1-8	
Switch	OFF	OFF	ON	ON	INT Mode
	OFF	ON	OFF	On	EXT Mode

Refer to the “Random Trigger Mode 1” at External Trigger Timing Chart.

(4) Random Trigger Mode 2 (INT/EXT)

Signal for one frame is output with synchronizing to trigger from outside and the accumulation time starts at trigger up (positive input) or trigger down (negative input). The shutter speed is set with pulse width. Trigger re-input during trigger prohibition period is neglected. Internal clock is oscillates with LC at External Sync Mode. HD input is not necessary at INT Mode.

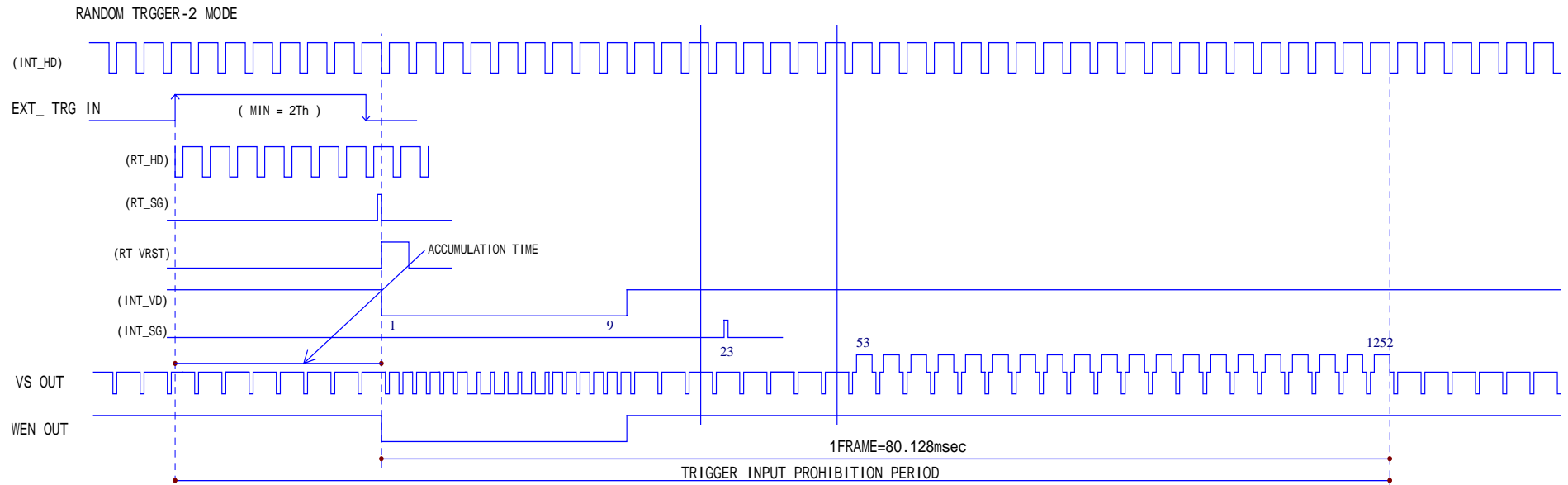
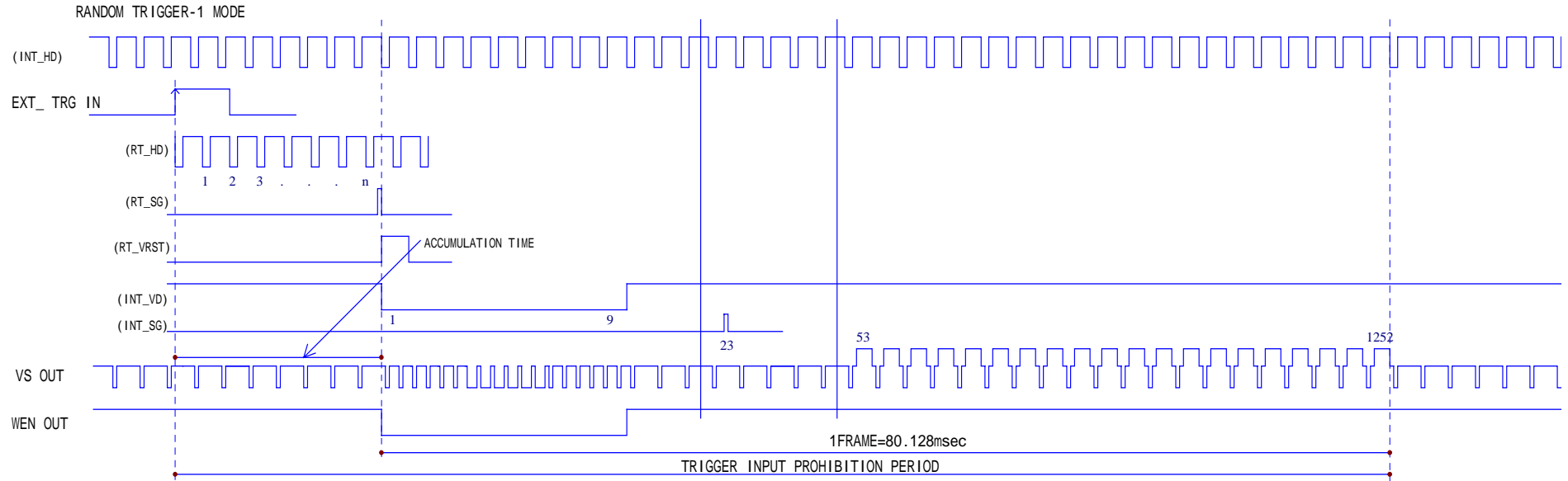
Item	Specification	Remarks
Input Sync Signal Width	HD Input : + 2V to + 5V (Negative)	TTL at EXT
Input Sync Frequency Limitation	HD input : 15.625KHz +/- 1.0%	At EXT
Trigger Signal Width	Trigger Input : + 2V to + 5V Polarity selectable	TTL
Trigger Signal Pulse	128.0 micro sec (2H) or more	
Output Sync Signal	VD Output : + 3.0V or more (Negative) Only effective frame is output at INT	At open
Effective Frame Signal	WEN Output : + 3.0V or more (Negative)	At open

SW1-4	OFF	ON	Remarks
Trigger Polarity	Positive	Negative	

Item	Specification				Remarks
	SW1-5	SW1-6	SW1-7	SW1-8	
Switch	ON	ON	OFF	ON	INT Mode
	OFF	OFF	OFF	On	EXT Mode

Refer to the “Random Trigger Mode 2” at External Trigger Timing Chart.

VCC - 880A EXTERNAL TRIGGER TIMING

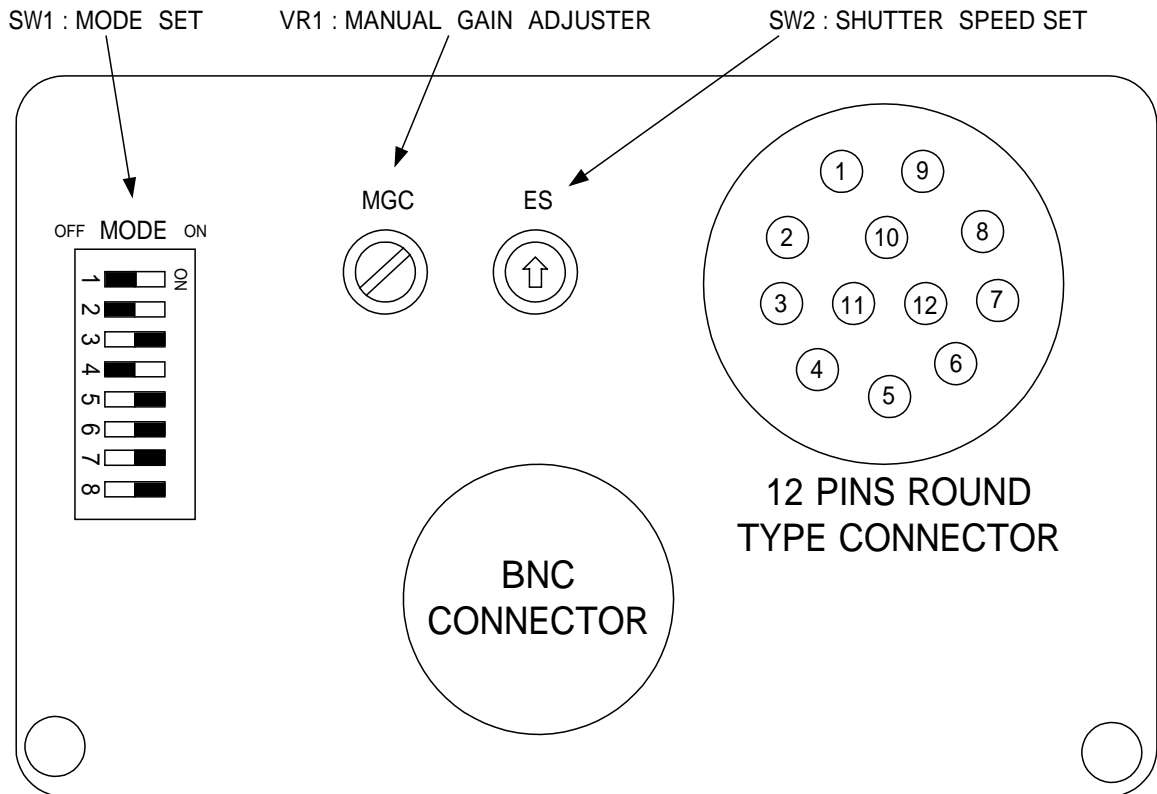


VCC-880A EXTERNAL SYNC TIMING

6. Function Set

Note: Do not operate any switches not stated in this specification. Improper switching may cause mis-operation.

Back-side Switch and Volume Layout



SW1: Function Set (8 bit Dip Switch)

Item		Specification		Remarks
		OFF	ON	
Gain Control	SW1-1	0 dB	Manual Gain	VR1: Manual Gain set
Gamma Selection	SW1-2	OFF (Gamma = 1.0)	ON (Gamma = 0.45)	
EXT VD/HD Input Termination	SW1-3	75 ohm	Open	
External Trigger Input Polarity	SW1-4	Positive	Negative	

Item	Specification				Remarks
	SW1-5	SW1-6	SW1-7	SW1-8	
Internal Sync Mode	ON	ON	ON	ON	INT HD, INT VD OUT
External Sync Mode (Normal Reset)	OFF	ON	ON	ON	EXT HD, EXT VD IN
External Sync Mode (Direct Reset)	ON	OFF	ON	ON	EXT HD, EXT VD IN
Random Trigger Mode 1_INT	OFF	OFF	ON	ON	Trigger IN, HD/VD/WEN OUT
Random Trigger Mode 2_INT	ON	ON	OFF	ON	Trigger IN, HD/VD/WEN OUT
Random Trigger Mode 1_EXT	OFF	ON	OFF	ON	Trigger EXT, HD IN, WEN OUT
Random Trigger Mode 2_EXT	ON	OFF	OFF	ON	Trigger EXT, HD IN, WEN OUT
Internal Sync Mode	ON	ON	ON	OFF	INT HD, INT VD OUT
Internal Sync Mode	OFF	ON	ON	OFF	INT HD, INT VD OUT
Internal Sync Mode	ON	OFF	ON	OFF	INT HD, INT VD OUT
Internal Sync Mode	OFF	OFF	OFF	ON	INT HD, INT VD OUT
Internal Sync Mode	ON	ON	OFF	OFF	INT HD, INT VD OUT

Note: Set switches with power OFF. Not set in the operation.

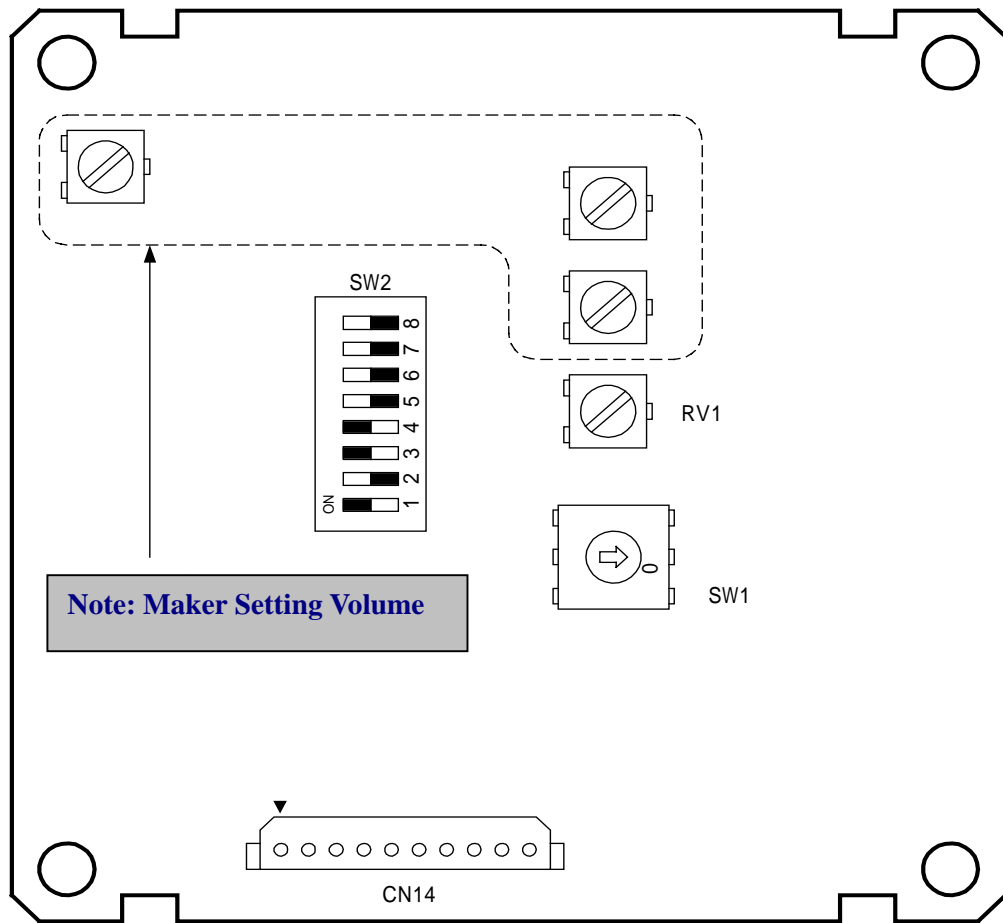
SW2: Shutter Speed (10 Positions Rotary Switch)

Item	Specification	Remarks
Electric Shutter Setting	0 : Shutter OFF (1/12)	Available at Internal Sync Mode, External Sync Mode (Normal Reset), External Trigger Mode (random Trigger Mode-1)
	1 : 1/125	
	2 : 1/250	
	3 : 1/500	
	4 : 1/1000	
	5 : 1/2000	
	6 : 1/4000	
	7 : 1/10000	
	8 : Shutter OFF (1/12)	
	9 : Shutter OFF (1/12)	

VR1: Manual Gain Control Volume

Range of 0 dB to 12 dB is adjustable.

Inside Switch and Volume Layout



Inside Switch SW1: H Phase Set (16 Positions rotary Switch)

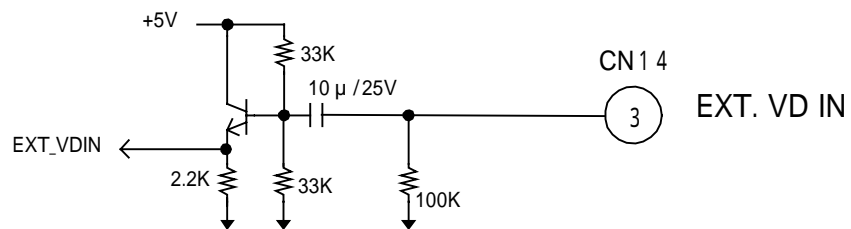
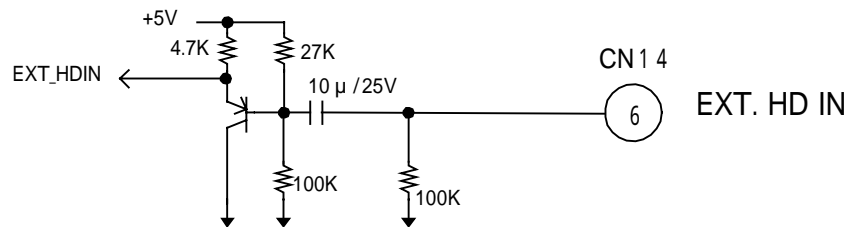
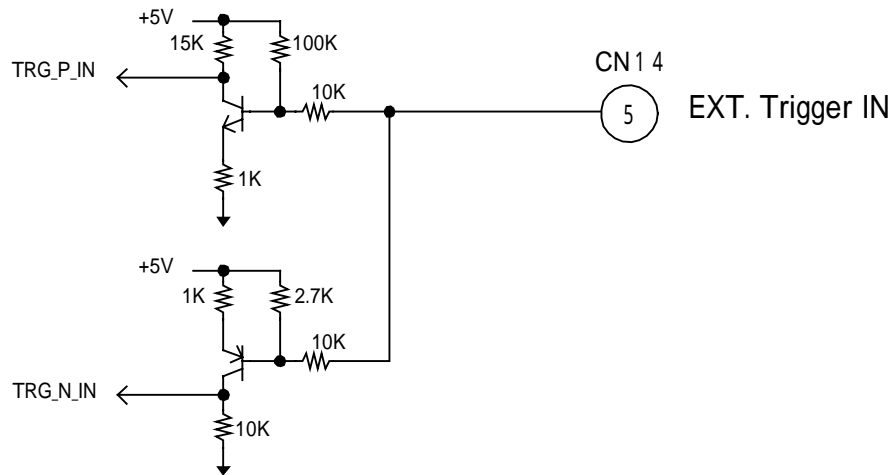
Item	Specification	Remarks
H Phase	0 to 15: 33nsec/ 1 step with 16 steps	

Set Forward and Delay of H Phase with SW2-2.

Inside SW2 (8 Bits Dip Switch)

Item	Specification	Specification		Remarks
		OFF	ON	
No Function	SW2-1		Fixed	
H Phase Polarity	SW2-2	Forward (-) Direction	Delay (+) Direction	
No Function	SW2-3		Fixed	
No Function	SW2-4		Fixed	
No Function	SW2-5	Fixed		
No Function	SW2-6	Fixed		
No Function	SW2-7	Fixed		
Aperture Compensation	SW2-8	Aperture OFF	Aperture ON	

7. External HD, VD, Trigger Input Interface



8. Mechanical Specification

8-1. Appearance

Item	Specification	Remarks
Appearance	Refer to the drawing	

9. In/Out Connector

9-1. Connector Type

Item	Specification	Remarks
12 Pins Round Type Connector	HR10A-10R-12PB (01)	Hirose
BNC Connector	P2270	Emden

9-2. Connector Pin # and Signal Name

12 Pins Round Type Connector

Pin #	Internal Sync Mode	External Sync Mode	External Trigger Mode
1	GND	GND	GND
2	DC + 12V In	DC + 12V IN	DC + 12V
3	GND	GND	GND
4	Video Out	Video Out	Video Out
5	GND	GND	GND
6	INT HD OUT	EXT HD IN	INT/EXT HD OUT/IN
7	INT VD OUT	EXT VD IN	INT/EXT VD OUT/
8	GND	GND	GND
9	NC	NC	NC
10	(WEN OUT)	(WENOUT)	WEN OUT
11	(EXT Trigger IN)	(EXT Trigger IN)	EXT Trigger IN
12	GND	GND	GND

BNC Connector

	Signal Name
	VIDEO OUT
	GND

10. Preset Mode at Shipping

Back-side Switch Setting

Item	Setting	Switch	
Gain Control	0dB	SW1-1	OFF
Gamma Selection	OFF (= 1.0)	SW1-2	OFF
Input Termination of EXT HD/VD	Open	SW1-3	ON
External Trigger Polarity	OFF (Positive)	SW1-4	OFF
Sync Mode	Internal Sync Mode	SW1-5	ON
		SW1-6	ON
		SW1-7	ON
		SW1-8	ON

Inside Switch Setting

Item	Setting	Inside Switch	
No Function		SW2-1	ON (Fixed)
H Phase Polarity	Forward (-) Direction	SW2-2	OFF
No Function		SW2-3	ON (Fixed)
No Function		SW2-4	ON (Fixed)
No Function		SW2-5	OFF (Fixed)
No Function		SW2-6	OFF (Fixed)
No Function		SW2-7	OFF (Fixed)
Aperture Compensation	Aperture OFF	SW2-8	OFF

11. Handling Notice



Please keep the following notice to handle a camera properly. Any defect and/or trouble without following below notice are not guaranteed.



Check camera setting such as Int/Ext Sync Signal and using purpose carefully before switching power on.



Do not use a camera at dusty or high humid environment.



Handle with care to protect a camera against shock or static electricity. They may cause damage.



Follow the connecting information, “8. In/Out Connector”, to connect a camera. Improper connection may cause damage to a camera. Especially, camera setting such as EXT/INT may cause damage to a camera and its connected peripherals.



Check ground voltage difference between a camera and other equipment connected with. AC leakage from connected equipment such as a color monitor may cause damage to a camera.



Supply specified proper voltage to a camera. Unstable or improper power may cause damage and mis-operation of a camera.



Do not take pictures of sunshine or high luminous lamp directly. Keep a camera cap closed at any time to protect a lens and a camera when a camera is not in use.