

# OV7660 Setting

Company  
Confidential

Document No.: TBD

Last Modified Date: July 3rd, 2005

Document Revision: 1.0

Author: Frank Wang

OmniVision Technologies, Inc. reserves the right to make changes without further notice to any product herein to improve reliability, function or design. OmniVision does not assume any liability arising out of the application or use of any project, circuit described herein; neither does it convey any license under its patent nor the right of others.

This document contains information of a proprietary nature. None of this information shall be divulged to persons other than OmniVision Technologies, Inc. employee authorized by the nature of their duties to receive such information, or individuals or organizations authorized by OmniVision Technologies, Inc.

## 1.1

OVERVIEW	3
1.2 INITIALIZATION	3
1.3 LIGHT FREQUENCY	5
1.3.1 50Hz	5
1.3.2 60Hz	5
1.4 BRIGHTNESS	5
1.4.1 Brightness -3	5
1.4.2 Brightness -2	5
1.4.3 Brightness -1	5
1.4.4 Brightness 0 (Default)	6
1.4.5 Brightness 1	6
1.4.6 Brightness 2	6
1.4.7 Brightness 3	6
1.5 SATURATION	6
1.5.1 Saturation 1.2	6
1.5.2 Saturation 1.0 (Default)	6
1.5.3 Saturation 0.8	7
1.5.4 Saturation 0.6	7
1.5.5 Saturation 0.4	7
1.6 CONTRAST	7
1.6.1 Contrast -3	7
1.6.2 Contrast -2	8
1.6.3 Contrast -1	8
1.6.4 Contrast 0 (Default)	9
1.6.5 Contrast +1	10
1.6.6 Contrast +2	10
1.6.7 Contrast +3	11
1.7 SPECIAL EFFECTS	11
1.7.1 Normal (Default)	11
1.7.2 Sepia	12
1.7.3 Antique	12
1.7.4 Bulish	12
1.7.5 Greenish	12
1.7.6 Reddish	12
1.7.7 Negative	12
1.7.8 Black/white	12
1.7.9 Black/White Negative	12
1.8 LIGHT ENVIRONMENT	12
1.8.1 50Hz	12
1.8.2 60Hz	13
1.9 LIGHT CONDITIONS	13
1.9.1 Auto	13
1.9.2 Sunny	13
1.9.3 Cloudy	13
1.9.4 Office	13
1.9.5 Home	14
1.9.6 Night	14



## Overview

Input Clock = 24Mhz  
 Preview VGA 15fps @ 60Hz  
                   VGA 12.5fps @ 50Hz  
 Capture VGA 15fps @ 60Hz  
                   VGA 12.5fps @ 50Hz

Output Format YCbCr 4:2:2 (ITU 656)  
 YCbCr to RGB conversion  

$$R = Y + (351 * (Cr - 128)) >> 8$$

$$G = Y - (179 * (Cr - 128) + 86 * (Cb - 128)) >> 8$$

$$B = Y + (443 * (Cb - 128)) >> 8$$

## 1.2 Initialization

```
42 12 80
;Insert 5ms delay here
42 11 81
42 92 00
42 93 00
42 9d 4c
42 9e 3f
42 3b 02
42 13 f0
42 10 00
42 00 00
42 01 80
42 02 80
42 13 f5
;
42 12 00
42 04 00
42 18 01
42 17 13
42 32 92
42 19 02
42 1a 7a
42 03 00
;
42 0e 84
42 0f 62
42 15 02
42 16 02
42 1b 01
42 1e 01
42 29 20 ;3c for external regulator
42 33 00
42 34 07
42 35 84
42 36 00
42 38 13
42 39 43
42 3a 00
42 3c 6c
42 3d 90
```

42 3f 29  
42 40 c1  
42 41 20  
42 6b 0a  
42 a1 c8  
;  
42 69 80  
42 43 f0  
42 44 10  
42 45 78  
42 46 a8  
42 47 60  
42 48 80  
42 59 ba  
42 5a 9a  
42 5b 22  
42 5c b9  
42 5d 9b  
42 5e 10  
42 5f e0  
42 60 85 ;05 for advanced AWB  
42 61 60  
42 9f 9d  
42 a0 a0  
;  
42 4f 66  
42 50 6b  
42 51 05  
42 52 19  
42 53 40  
42 54 59  
42 55 40  
42 56 40  
42 57 40  
42 58 0d  
;  
42 8b cc  
42 8c cc  
42 8d cf  
;  
42 6c 40  
42 6d 30  
42 6e 4b  
42 6f 60  
42 70 70  
42 71 70  
42 72 70  
42 73 70  
42 74 60  
42 75 60  
42 76 50  
42 77 48  
42 78 3a  
42 79 2e  
42 7a 28  
42 7b 22  
42 7c 04

42 7d 07  
42 7e 10  
42 7f 28  
42 80 36  
42 81 44  
42 82 52  
42 83 60  
42 84 6c  
42 85 78  
42 86 8c  
42 87 9e  
42 88 bb  
42 89 d2  
42 8a e6  
;  
42 14 2e  
42 24 68  
42 25 5C  
42 13 F7

### **1.3 Light Frequency**

#### **1.3.1 50Hz**

42 92 66

#### **1.3.2 60Hz**

42 92 00

### **1.4 Brightness**

#### **1.4.1 Brightness -3**

42 0f 6a  
42 24 50  
42 25 40  
42 27 a0  
42 28 a0  
42 2c a0

#### **1.4.2 Brightness -2**

42 0f 6a  
42 24 60  
42 25 50  
42 27 90  
42 28 90  
42 2c 90

#### **1.4.3 Brightness -1**

42 0f 6a  
42 24 70  
42 25 60  
42 27 88  
42 28 88

42 2c 88

#### 1.4.4 Brightness 0 (Default)

42 0f 6a  
42 24 80  
42 25 70  
42 27 80  
42 28 80  
42 2c 80

#### 1.4.5 Brightness 1

42 0f 6a  
42 24 90  
42 25 80  
42 27 20  
42 28 20  
42 2c 20

#### 1.4.6 Brightness 2

42 0f 6a  
42 24 a0  
42 25 90  
42 27 40  
42 28 40  
42 2c 40

#### 1.4.7 Brightness 3

42 0f 6a  
42 24 b0  
42 25 a0  
42 27 60  
42 28 60  
42 2c 60

### 1.5 Saturation

#### 1.5.1 Saturation 1.2

42 4f 9A  
42 50 A1  
42 51 07  
42 52 26  
42 53 60  
42 54 86

#### 1.5.2 Saturation 1.0 (Default)

42 4f 80  
42 50 86  
42 51 06

42 52 20  
42 53 50  
42 54 70

### 1.5.3 Saturation 0.8

42 4f 66  
42 50 6B  
42 51 05  
42 52 1A  
42 53 40  
42 54 5A

### 1.5.4 Saturation 0.6

42 4f 4D  
42 50 50  
42 51 04  
42 52 13  
42 53 30  
42 54 43

### 1.5.5 Saturation 0.4

42 4f 33  
42 50 36  
42 51 02  
42 52 0D  
42 53 20  
42 54 2D

## 1.6 Contrast

### 1.6.1 Contrast -3

42 6C 20  
42 6D 50  
42 6E 80  
42 6F C0  
42 70 C0  
42 71 A0  
42 72 90  
42 73 78  
42 74 78  
42 75 78  
42 76 40  
42 77 20  
42 78 20  
42 79 20  
42 7A 1E  
42 7B 09  
42 7C 02  
42 7D 07  
42 7E 17  
42 7F 47



42 80 5F  
42 81 73  
42 82 85  
42 83 94  
42 84 A3  
42 85 B2  
42 86 C2  
42 87 CA  
42 88 DA  
42 89 EA  
42 8A F9

### 1.6.2 Contrast -2

42 7C 04  
42 7D 07  
42 7E 1f  
42 7F 49  
42 80 5a  
42 81 6a  
42 82 79  
42 83 87  
42 84 94  
42 85 9f  
42 86 af  
42 87 bb  
42 88 cf  
42 89 df  
42 8A ee  
42 6C 20  
42 6D 50  
42 6E c0  
42 6F a8  
42 70 88  
42 71 80  
42 72 78  
42 73 70  
42 74 68  
42 75 58  
42 76 40  
42 77 30  
42 78 28  
42 79 20  
42 7A 1e  
42 7B 18

### 1.6.3 Contrast -1

42 7C 02  
42 7D 06  
42 7E 16  
42 7F 3A  
42 80 4C  
42 81 5C  
42 82 6A

42 83 78  
42 84 84  
42 85 8E  
42 86 9E  
42 87 AE  
42 88 C2  
42 89 DA  
42 8A EA  
42 6C 20  
42 6D 40  
42 6E 80  
42 6F 90  
42 70 90  
42 71 80  
42 72 70  
42 73 70  
42 74 60  
42 75 50  
42 76 40  
42 77 40  
42 78 30  
42 79 28  
42 7A 20  
42 7B 1d

#### 1.6.4 Contrast 0 (Default)

42 7C 04  
42 7D 07  
42 7E 10  
42 7F 28  
42 80 36  
42 81 44  
42 82 52  
42 83 60  
42 84 6C  
42 85 78  
42 86 8C  
42 87 9E  
42 88 BB  
42 89 D2  
42 8A E6  
42 6C 40  
42 6D 30  
42 6E 4B  
42 6F 60  
42 70 70  
42 71 70  
42 72 70  
42 73 70  
42 74 60  
42 75 60  
42 76 50  
42 77 48  
42 78 3A  
42 79 2E  
42 7A 28

42 7B 22

### 1.6.5 Contrast +1

42 7C 04  
42 7D 09  
42 7E 13  
42 7F 29  
42 80 35  
42 81 41  
42 82 4D  
42 83 59  
42 84 64  
42 85 6F  
42 86 85  
42 87 97  
42 88 B7  
42 89 CF  
42 8A E3  
42 6C 40  
42 6D 50  
42 6E 50  
42 6F 58  
42 70 60  
42 71 60  
42 72 60  
42 73 60  
42 74 58  
42 75 58  
42 76 58  
42 77 48  
42 78 40  
42 79 30  
42 7A 28  
42 7B 26

### 1.6.6 Contrast +2

42 7c 05  
42 7d 0b  
42 7e 16  
42 7f 2c  
42 80 37  
42 81 41  
42 82 4b  
42 83 55  
42 84 5f  
42 85 69  
42 86 7c  
42 87 8f  
42 88 b1  
42 89 cf  
42 8a e5  
42 6c 50  
42 6d 60  
42 6e 58

42 6f 58  
42 70 58  
42 71 50  
42 72 50  
42 73 50  
42 74 50  
42 75 50  
42 76 4c  
42 77 4c  
42 78 45  
42 79 3c  
42 7a 2c  
42 7b 24

### 1.6.7 Contrast +3

42 7c 04  
42 7d 09  
42 7e 14  
42 7f 28  
42 80 32  
42 81 3C  
42 82 46  
42 83 4F  
42 84 58  
42 85 61  
42 86 73  
42 87 85  
42 88 A5  
42 89 c5  
42 8a DD  
42 6c 40  
42 6d 50  
42 6e 58  
42 6f 50  
42 70 50  
42 71 50  
42 72 50  
42 73 50  
42 74 48  
42 75 48  
42 76 48  
42 77 48  
42 78 40  
42 79 40  
42 7a 30  
42 7b 2E

## 1.7 Special Effects

### 1.7.1 Normal (Default)

42 3a 00  
42 67 80  
42 68 80

### 1.7.2 Sepia

42 3a 10

42 67 40

42 68 a0

### 1.7.3 Antique

42 3a 10

42 67 40

42 68 b0

### 1.7.4 Bulish

42 3a 10

42 67 c0

42 68 80

### 1.7.5 Greenish

42 3a 10

42 67 40

42 68 40

### 1.7.6 Reddish

42 3a 10

42 67 80

42 68 C0

### 1.7.7 Negative

42 3a 20

42 67 80

42 68 80

### 1.7.8 Black/white

42 3a 10

42 67 80

42 68 80

### 1.7.9 Black/White Negative

42 3a 30

42 67 80

42 68 80

## 1.8 Light Environment

### 1.8.1 50Hz

42 2a 0

42 2b 9d

## 1.8.2 60Hz

42 2a 0

42 2b 0

## 1.9 Light Conditions

### 1.9.1 Auto

Saturation = 1.0

Brightness = 0

Contrast = 0

Register Setting

42 14 2e

42 18 00

42 17 02

42 3f 2a

42 41 20

42 a1 c0

### 1.9.2 Sunny

Saturation = 1.0

Brightness = 0

Contrast = 0

Register Setting

42 14 1e

42 18 00

427 02

42f 2a

42 41 20

42 a1 c0

### 1.9.3 Cloudy

Saturation = 1.0

Brightness = 0

Contrast = 0

Register Setting

42 14 1e

42 18 00

42 17 02

42f 2a

421 20

421 c0

### 1.9.4 Office

Saturation = 1.0

Brightness = 0

Contrast = 0

Register Setting

424 2e

4200

427 02

42f 2a

421 20  
421 c0

### 1.9.5 Home

Saturation = 1.0

Brightness = 0

Contrast = 0

Register Setting

424 2e  
428 00  
427 02  
42f 2a  
421 20  
421 c8

### 1.9.6 Night

Saturation = 0.4

Brightness = 1

Contrast = Night

42 6c f0  
42 6d f0  
42 6e f0  
42 6f 70  
42 70 58  
42 71 58  
42 72 48  
42 73 48  
42 74 38  
42 75 40  
42 76 34  
42 77 34  
42 78 2e  
42 79 28  
42 7a 24  
42 7b 22  
42 7c 0f  
42 7d 1e  
42 7e 3c  
42 7f 58  
42 80 63  
42 81 6e  
42 82 77  
42 83 80  
42 84 87  
42 85 8f  
42 86 9c  
42 87 a9  
42 88 c0  
42 89 d4  
42 8a e6  
Register Setting  
424 4e  
428 01  
427 13  
42 3f 81  
42 41 00

42 a1 c8