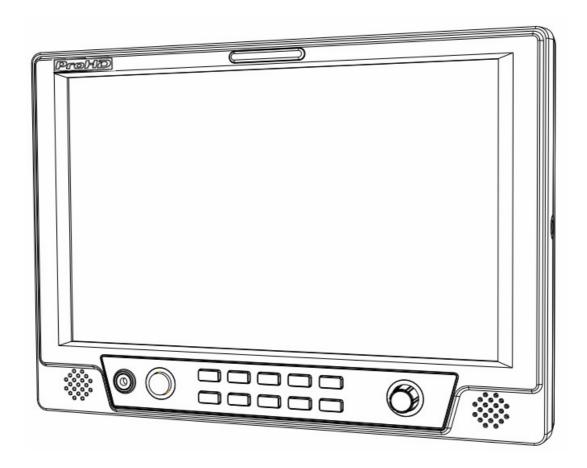


9" Portable On-camera LCD Monitor



User Manual

Model:	DT-X91F	HDSDI&HDMI, Waveform, Audio meter, Focus assist
	DT-X91H	3GSDI&HDMI
	DT-X91C	HDMI

Please read this User Manual throughout before using.

Preface

Congratulations on your purchase of this product. Please read this user manual carefully.

- 1. All internal technologies of this product are protected, including device, software and trademark.

 Reproduction in whole or in part without written permission is prohibited.
- 2. All brands and trademarks are protected and other relative trademarks in this user manual are the properties of their respective owners.
- 3. Due to constant effort of product development, SWIT Electronics reserves the right to make changes and improvements to the product described in this manual without prior notice.
- 4. The warranty period of this product is 2 years, and does not cover the following:
 - (1) Physical damage to the surface of the products, including scratches, cracks or other damage to the LCD screen or other externally exposed parts;
 - (2) Misuse, abuse or negligent operation to the product;
 - (3) The product is disassembled by anyone other than an authorized service center.
 - It is considered normal that the LCD bright dot defects are not to exceed three.
- 5. For any suggestions and requirements on this product, please contact us through phone, fax, Email, etc.

ProHD

SWIT Electronics Co., Ltd. / SWIT Electronics USA, LLC.

Address: 4300 Stevens Creek Blvd. Suite 230

San Jose, CA 95129

Toll free: 1 866 986-SWIT(7948)

Tel: 408 260-8258 Fax: 408 228-8438 Email: info@swit.us Website: www.swit.us

Maintenance

Monitor

- 1. Please keep the signal terminals and the cooling vent away from knife-edge, metal or liquid in order to avoid short-circuit and damage.
- 2. Please don't try to disassemble any parts of the monitor by yourself, which would probably damage the monitor and do harm to human body, and it will cause the invalidation of product warranty.
- 3. Please don't touch the screen with your fingers, which would probably deface the screen.
- 4. Please don't press the screen; the LCD is extremely exquisite and flimsy.

• The power

Please use the provided power adapter or the battery recommended by the manufacturer in order to avoid damage. For a third party power adapter, please make sure the voltage range, supplied power, and polarity of power lead are fit.

Please disconnect the power cable or take off the battery under the following situations:

- 1. If you do not operate this monitor for a period of time;
- 2. If the power cable or power adaptor is damaged;
- 3. If the monitor housing is broken.

Working Environment

- 1. Please don't lay this product on the unstable place.
- 2. Please don't lay this product in hot, cold or wet location.

Cleaning

- 1. Please clean the screen with dry and downy cloth or special LCD cleanser.
- 2. Please do not press hard when cleaning the screen.
- 3. Please do not use water or other chemical cleanser to clean the screen. The chemical may damage the LCD.
- 4. For first time use, please tear off the factory LCD film. To protect the LCD screen, please post the LCD protection film offered in the package.

DT-X91F

♦ High resolution 9" LCD Panel

16:9, 1280×800, 16.77 million colors

♦ Multiple inputs

2 HD/SD-SDI, 1 HDMI and 1 Composite input.

◆ Loop through outputs

2 HD/SD-SDI and 1 HDMI loop through output.

◆ HDMI converted to SDI output

Supported HDMI formats: 480i / 576i / 720p (50, 59.94, 60) / 1080i (50, 59.94, 60) / 1080P (23.98 24, 25, 29.97, 30), and the output SDI will embed the audio (48KHz) from HDMI.

◆ Waveform (Y, Cb, Cr, R, G, B) and full scale

There are totally 6 kinds of waveform display, available under both SDI and HDMI, to check the Luminance (Y), Blue-difference (Cb), Red-difference (Cr), Red (R), Green (G), Blue (B), and the Y, Cb, Cr can be simultaneously displayed, R, G, B can be simultaneously displayed, and each of the waveforms can be set to full scale display.

♦ Vector scope

The displayed vector scope pattern is available under both SDI and HDMI, represents saturation as distance from the center of the circle, and hue as the angle, in standard position, around it.

Histogram (R, G, B)

The histogram is a bar graph that shows the distribution of luminance values in the picture. There're R, G, B histograms that individually displayed simultaneously, available under both SDI and HDMI.

◆ 16-ch audio meter

Under HDSDI, it displays 16 channels audio bars, with mark, and under SDSDI or HDMI, it displays 2 channels audio bars with mark. The audio bar is green, and will turn yellow when audio exceeds -20dB, and turn red when exceeds -10dB.

SDI timecode

Under SDI input, it can display the SMPTE timecode, which is used extensively for synchronization, and for logging and identifying material in recorded media.

♦ Peaking focus assist (red/blue switch)

The Peaking focus assist function is to mark the sharpest edges of the image with red or blue color, for users to check if the subjects are focused.

Zebra stripes

Zebra Stripes are used to check if the image is over exposed or not by showing black and white lines on the monitor. It is considered over exposed when luminance value exceeds 90%.

◆ False color

The false color is used to aid in the setting of camera exposure. Under false color mode, there's a false color key on the bottom of screen for reference. The over exposed subjects (above 101 IRE) on the monitor will display as RED, and the underexposed subjects will display as BLUE. For correct exposed subjects, it will display as green and pink.

Blue Only

Under the Blue Only Mode, only the blue pixels are used to generate the image, because hue and saturation can be adjusted quicker and more accurately.

♦ DSLR scale zoom in

The Canon DSLR outputs the CMOS sensor ratio HDMI and this zoom in mode can make the effective image scale full screen on the monitor.

♦ User definable function keys

There are 3 function keys on the monitor front panel, that permit users to define shortcuts for the various functions.

◆ User editable video title

User can edit a video title for the current camera, and the title will display on the top of screen.

◆ Front and Rear 3-color TALLY light

2 TALLY lights design, to give "live" signals to people in front of the camera, as well as the camera operator behind.

Image Flip

Set image to rotate by 180°.

DT-X91H

◆ High resolution 9" LCD Panel

16:9, 1280×800, 16.77 million colors

◆ 3Gbps SDI support

Accepts 3G/HD/SD-SDI input.

Multiple inputs

1 3G/HD/SD-SDI, 1 HDMI, 1 Composite input and L/R stereo audio.

◆ Loop through outputs

1 3G/HD/SD-SDI, 1 HDMI and 1 Composite video loop through output.

◆ SDI/HDMI embedded audio output

Convert SDI/HDMI embedded audio to analog and output via speaker or 3.5mm earphone jack

Image Flip.

Set image to rotate by 180°

◆ DSLR scale zoom in

The Canon DSLR outputs the CMOS sensor ratio HDMI and this zoom in mode can make the effective image scale full screen on the monitor.

◆ User definable function keys

There are 2 function keys on the monitor front panel, that permit users to define shortcuts for the various functions.

◆ User editable video title

User can edit a video title for the current camera, and the title will display on the top of screen.

♦ Front and Rear 3-color TALLY light

2 TALLY lights design, to give "live" signals to people in front of the camera, as well as the camera operator behind.

DT-X91C

♦ High resolution 9" LCD Panel

16:9, 1280×800, 16.77 million colors.

◆ Multiple inputs

1 HDMI, 1 Composite input and L/R stereo audio input.

♦ Loop through outputs

1 HDMI and 1 Composite loop through output.

HDMI embedded audio output

Convert HDMI embedded audio to analog and output via speaker or 3.5mm earphone jack.

◆ DSLR scale zoom in

The Canon DSLR outputs the CMOS sensor ratio HDMI and this zoom in mode can make the effective image scale full screen on the monitor.

♦ Image Flip

Set image to rotate by 180°.

◆ User definable function keys

There are 2 function keys on the monitor front panel, that permit users to define shortcuts for the various functions.

◆ User editable video title

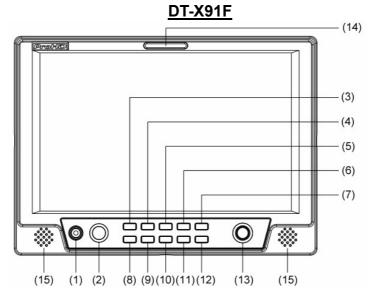
User can edit a video title for the current camera, and the title will display on the top of screen.

◆ Front and Rear 3-color TALLY light

2 TALLY lights design, to give "live" signals to people in front of the camera, as well as the camera operator behind.

2. Panel Instruction

Front view



- (1) **PHONE:** Earphone jack, for SDI embedded audio, HDMI embedded audio monitoring
- (2) **POWER:** Power on/off

Connect with power cable, press the "POWER" and the power indicator is turned on and the monitor will be switched on and get into normal working status. Press the "POWER" again, the indicator is turned off and monitor is switched off.

Disconnect with power cable or battery if the monitor will not be used for a period of time.

- (3) **SOURCE:** Input signal selection, revolve the "ENTER" to select the input video signal.
- (4) **F1:** User definable function key 1
- (5) **FOCUS:** Peaking Focus Assist

Press "FOCUS" once, it will display the current peaking on/off status. Press "FOCUS" again to switch on RED line focus assist, switch on BLUE line focus assist, and switch off in turn.

(6) **F.COLOR**: False color

Press "F.COLOR" once, it will display the current false color on/off status. Press "F.COLOR" again to switch on/off the false color mode.

(7) **DISPLAY:** Display current settings

Press "Display" to display safety mark, title and the current input signal information

- (8) **F2:** User definable function key 2
- (9) **F3:** User definable function key 3
- (10) WAVEFORM: Display waveform

Press "WAVEFORM" once, it will display the waveform menu as:

Revolve "ENTER" to select a waveform display mode and turn it on.

The selected waveform will display on the screen.

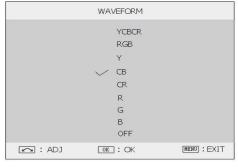
(11) **VECTOR**: Display vector scope

Press "VECTOR" to switched on/off the Vector scope

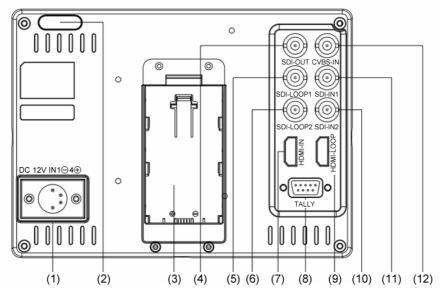
- (12) MENU: Press to enter Menu
- (13) ENTER: Select and Apply

Under menu system, revolve "ENTER" to adjust settings and press to apply; and out of menu system, directly revolve "ENTER" to adjust volume.

- (14) TALLY Light: Red, Green and Yellow 3-color TALLY indicator
- (15) Speaker: Output SDI, HDMI and Analog audio



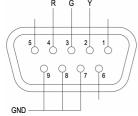
Rear view



- (1) **DC 12V IN:** Connect with DC12V 4-pin XLR power adapter.
- (2) TALLY Light: Red, Green and Yellow 3-color TALLY indicator
- (3) Battery mount:

Connect with SSL-JVC50 battery (optional) to power the monitor.

- (4) **SDI-OUT:** HDMI converted to SDI output (BNC connector)
- (5) (6) **SDI LOOP1/2:** HD/SD-SDI loop through output (BNC connector)
- (7) **HDMI-IN:** HDMI input
- (8) **TALLY controlling port** (RS-232): Terminal description is as follows:



Terminal	1	2	3	4	5	6	7	8	9
Description		Υ	G	R			GND	GND	GND

The RED light is on when connecting the terminal "R" with "GND", and goes out when disconnecting. The GREEN light is on when connecting the terminal "G" with "GND", and goes out when disconnecting. The YELLOW light is on when connecting the terminal "Y" with "GND", and goes out when disconnecting

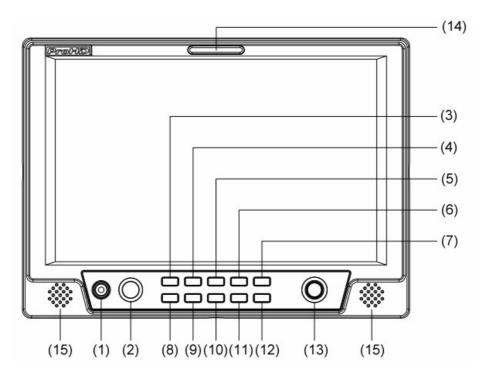
- (9) **HDMI-LOOP:** HDMI loop through output
- (10) (11) **SDI IN1/2:** HD/SD-SDI input (BNC connector)
- (12) CVBS-IN: Composite video input (BNC connector)

Input formats

Input		Supported formats
CVBS		PAL / NTSC
HDMI		480I / 576I / 480P / 576P
		1080i (60 / 59.94 / 50)
		720p (60 / 59.94 / 50)
		1080p (60 / 59.94 / 50 / 30 / 29.97 / 25 / 24 / 23.98)
SDI	SMPTE-274M	1080i (60 / 59.94 / 50)
	SIVIP I E-2/4IVI	1080p (30 / 29.97 / 25 / 24 / 23.98)
	SMPTE-RP211	1080psf (30 / 29.97 / 25 / 24 / 23.98)
	SMPTE-296M	720p (60 / 59.94 / 50)
	SMPTE-125M	480i (59.94)
	ITU-R BT.656	576i (50)

DT-X91H

Front view



- (1) **PHONE:** Earphone jack, for SDI embedded audio, HDMI embedded audio and analog audio monitoring
- (2) **POWER:** Power on/off

Connect with power cable, press the "POWER" and the power indicator is turned on and after 10 seconds, the monitor will be switched on and get into normal working status. Press the "POWER" again, the indicator is turned off and monitor is switched off.

Disconnect with power cable or battery if the monitor will not be used for a period of time.

- (3) **CVBS:** Press to switch the input signal to Composite video
- (4) **HDMI**: Press to switch the input signal to HDMI
- (5) **SDI:** Press to switch the input signal to SDI
- (6) **SCAN:** Overscan / Underscan switch
- (7) **MENU:** Press to enter Menu
- (8) **F1:** User definable function key 1
- (9) **F2:** User definable function key 2
- (10) **RATIO:** 16:9 and 4:3 switch
- (11) **ZOOM:** Picture Zoom-in

Press "ZOOM" to switch ZOOM1: Canon DSLR scale zoom-in, and ZOOM2: pixel to pixel zoom-in.

(12) **DISPLAY:** Display current settings

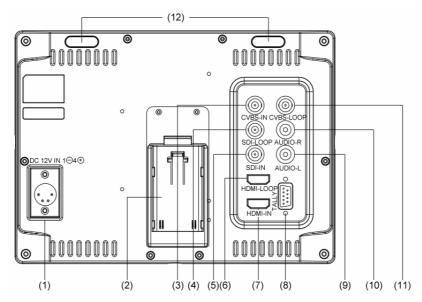
Press "Display" to display safety mark, title and the current input signal information

(13) **ENTER:** Select and Apply

Under menu system, revolve "ENTER" to adjust settings and press to apply; and out of menu system, directly revolve "ENTER" to adjust volume.

- (14) **TALLY Light:** Red, Green and Yellow 3-color TALLY indicator
- (15) Speaker: Output SDI, HDMI and Analog audio

Rear view



(1) **DC 12V IN:** Connect with DC12V 4-pin XLR power adapter.

(2) **Battery mount:** Connect with SSL-JVC50 battery (optional) to power the monitor.

(3) CVBS IN: Composite video input (BNC connector)

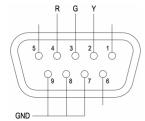
(4) **SDI-LOOP**: 3G/HD/SD-SDI loop through output (BNC connector)

(5) **SDI-IN:** 3G/HD/SD-SDI input (BNC connector)

(6) **HDMI-LOOP:** HDMI loop through output

(7) **HDMI-IN:** HDMI input

(8) **TALLY controlling port** (RS-232): terminal description is as follows:



Description Y G R GND GND GND	Terminal	1	2	3	4	5	6	7	8	9
	Description		Y	G	R			GND	GND	GND

The RED light is on when connecting the terminal "R" with "GND", and goes out when disconnecting. The GREEN light is on when connecting the terminal "G" with "GND", and goes out when disconnecting. The YELLOW light is on when connecting the terminal "Y" with "GND", and goes out when disconnecting.

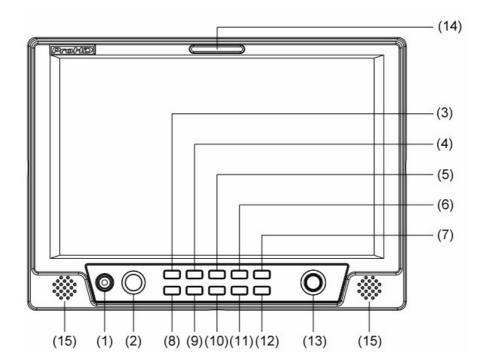
- (9) **AUDIO L:** Stereo audio left channel input (RCA connector)
- (10) **AUDIO R:** Stereo audio right channel input (RCA connector)
- (1) CVBS-LOOP: Composite video loop through output (BNC connector)
- (12) **TALLY Light:** Red, Green and Yellow 3-color TALLY indicator.

Input formats

Input		Supported formats
CVBS		PAL / NTSC
		480I / 576I / 480P / 576P
ПОМ		1080i (60 / 59.94 / 50)
HDMI		720p (60 / 59.94 / 50)
		1080p (60 / 59.94 / 50 / 30 / 29.97 / 25 / 24 / 23.98)
SDI	SMPTE-425M	1080p (60 / 59.94 / 50)
	SMPTE-274M	1080i (60 / 59.94 / 50)
	SIVIF I E-2/4IVI	1080p (30 / 29.97 / 25 / 24 / 23.98)
	SMPTE-RP211	1080psf (30 / 29.97 / 25 / 24 / 23.98)
	SMPTE-296M	720p (60 / 59.94 / 50)
	SMPTE-125M	480i (59.94)
	ITU-R BT.656	576i (50)

DT-X91C

Front view



(1) **PHONE**: Earphone jack, for HDMI embedded audio and analog audio monitoring

(2) **POWER:** Power on/off

Connect with power cable, press the "POWER" and the power indicator is turned on and after 10 seconds, the monitor will be switched on and get into normal working status. Press the "POWER" again, the indicator is turned off and monitor is switched off.

Disconnect with power cable or battery if the monitor will not be used for a period of time.

(3) **CVBS:** Press to switch the input signal to Composite video

(4) **HDMI:** Press to switch the input signal to HDMI

(5) **B/W**: Black and White mode

(6) **SCAN:** Overscan / Underscan switch

(7) **MENU:** Press to enter Menu

(8) **F1:** User definable function key 1 (9) **F2:** User definable function key 2

(10) **RATIO:** 16:9 and 4:3 switch

(11) **ZOOM:** Picture Zoom-in

Press "ZOOM" to switch ZOOM1: Canon DSLR scale zoom-in, and ZOOM2: pixel to pixel zoom-in.

(12) **DISPLAY:** Display current settings

Press "Display" to display safety mark, title and the current input signal information

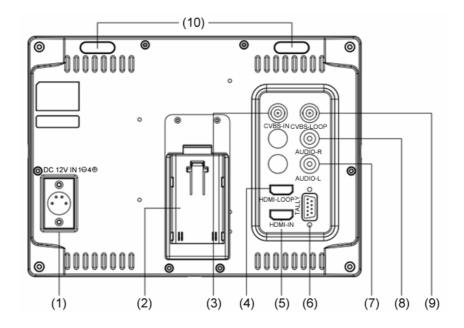
(13) **ENTER:** Select and Apply

Under menu system, revolve "ENTER" to adjust settings and press to apply; and out of menu system, directly revolve "ENTER" to adjust volume.

(14) **TALLY Light:** Red, Green and Yellow 3-color TALLY indicator

(15) Speaker: Output HDMI and Analog audio

Rear view



(1) **DC 12V IN:** Connect with DC12V 4-pin XLR power adapter.

(2) Battery mount:

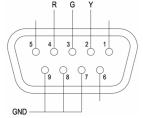
Connect with SSL-JVC50 battery (optional) to power the monitor.

(3) **CVBS IN:** Composite video input (BNC connector)

(4) **HDMI-LOOP:** HDMI loop through output

(5) **HDMI-IN:** HDMI input

(6) **TALLY controlling port** (RS-232): terminal description is as follows:



Terminal	1	2	3	4	5	6	7	8	9
Description		Υ	G	R			GND	GND	GND

The RED light is on when connecting the terminal "R" with "GND", and goes out when disconnecting. The GREEN light is on when connecting the terminal "G" with "GND", and goes out when disconnecting.

The YELLOW light is on when connecting the terminal "Y" with "GND", and goes out when disconnecting

(7) **AUDIO L:** Stereo audio L input (RCA connector)

(8) AUDIO R: Stereo audio R input (RCA connector)

(9) **CVBS-LOOP**: Composite video loop through output (BNC connector)

(10) TALLY Light: Red, Green and Yellow 3-color TALLY indicator

Input formats

Input	Supported formats
CVBS	PAL / NTSC
	480I / 576I / 480P / 576P
LIDMI	1080i (60 / 59.94 / 50)
HDMI	720p (60 / 59.94 / 50)
	1080p (60 / 59.94 / 50 / 30 / 29.97 / 25 / 24 / 23.98)

3. Menu Operation

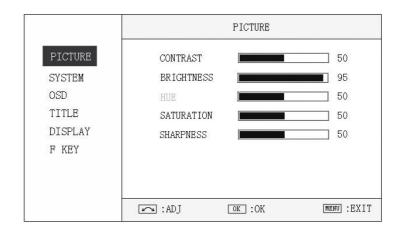
Press "MENU" and it will display menu system

- > Revolve "OK" to select an item. The selected item will be highlighted display.
- Press "OK" to enter the selected item.
- Under menu system, press "MENU" to back to previous menu.
- The menu will automatically save and quit if it remains idle.

4. Picture Settings Submenu

The Picture Settings Submenu includes:

- (1) **CONTRAST:** 0-100 value adjustment
- (2) **BRIGHTNESS**: 0-100 value adjustment
- (3) **HUE:** 0-100 value adjustment (Only available under Composite input)
- (4) **SATURATION:** 0-100 value adjustment
- (5) **SHARPNESS:** 0-100 value adjustment



5. System Configuration Submenu

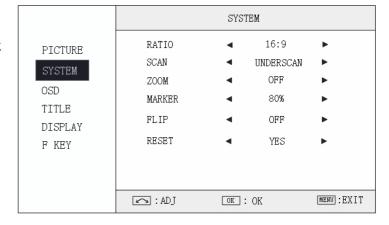
The System Configuration Submenu includes:

- (1) **RATIO:** Select "16:9" or "4:3" to adjust the aspect ratio.
- (2) SCAN: "UNDERSCAN" / "OVERSCAN" selection
- (3) **ZOOM:** "OFF", "ZOOM1" and "ZOOM2" selection

ZOOM1: Canon DSLR scale zoom-in

ZOOM2: Pixel to Pixel zoom-in

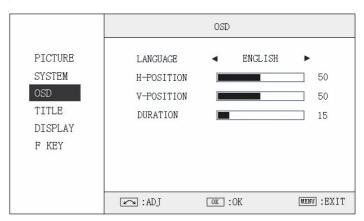
- (4) **MARKER:** Select and set the safety mark scale from 80%, 85%, 90% and 95%.
- (5) **FLIP:** Select "YES" to flip the image by 180° .
- (6) **RESET:** Revolve "OK" to RESET and press to recover all to factory setting.



6. OSD Settings Submenu

The OSD Settings Submenu includes:

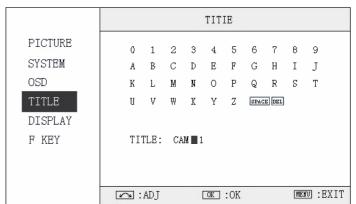
- (1) **LANGUAGE:** Menu language English / Chinese selection
- (2) **H-POSITION:** Menu horizontal position (0-100) adjustment, real-time preview, default value: 50, center.
- (3) **V-POSITION:** Menu vertical position (0-100) adjustment, real-time preview, default value: 50, center.
- (4) **DURATION:** Menu timeout setting Set a time (in seconds) in which the menu will automatically quit if remains idle. Default: 10 seconds; Range: 5 seconds to 60 seconds.



7. Title Settings Submenu

Revolve "OK" button to select the letters, and press "OK" to input. Select SPACE to input space and DEL to delete the left letter. Max 10 letters are supported.

After setting, press "MENU", the system will save data to current user and quit menu. The menu will automatically save and quit if it remains idle.



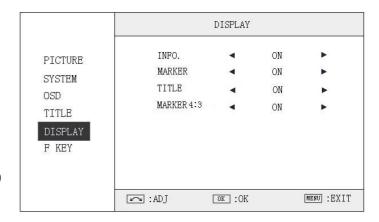
8. Display Settings Submenu

The DISPLAY settings submenu is to select the items to be displayed on screen when 'DISPLAY" button is pressed. Revolve "OK" to turn on/off the items:

(1) **INFO:** Including Input format, aspect ratio, underscan/overscan, zoom status

(2) MARKER: Safety mark(3) TITLE: User edited title

(4) **MARKER4:3:** The 4:3 scale mark on 16:9 image. (Only available under HD input)



9. FUNCTION KEY Settings Submenu

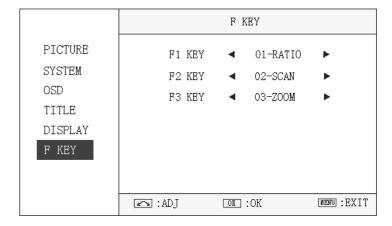
The F KEY Settings Submenu is to define Function Keys on the front keyboard.

The DT-X91F has 3 function keys:

F1, F2 and F3;

The DT-X91H and DT-X91C has 2 function keys:

F1 and F2.



The available function items of each model are:

-----DT-X91F-----

01-RATIO: Aspect ratio switch

02-SCAN: Underscan / Overscan switch

03-ZOOM: Picture Zoom-in

04-B/W: Color / Black & white switch

05-BLUE ONLY: Blue only mode switch on/off **06-ZEBRA:** Zebra over exposure switch on/off

07-VECTOR: Vector scope switch on/off

08-PATTERN: Internal colorbar switch on/off

09-RGB HIST: R, G, B Histogram switch on/off

10-TIMECODE: SDI timecode display switch on/off

11-F.COLOR: False color mode switch on/off

12-AUDIO BAR: Audio meter display switch on/off

13-FOCUS: Peaking focus assist switch on/off, and

red/blue selection

14-FLIP: Image flip

-----DT-X91H-----

01-RATIO: Aspect ratio switch

02-SCAN: Underscan / Overscan switch

03-ZOOM: Picture Zoom-in

04-B/W: Color / Black & white switch

05-FLIP: Image flip

-----DT-X91C-----

01-RATIO: Aspect ratio switch

02-SCAN: Underscan / Overscan switch

03-ZOOM: Picture Zoom-in

04-B/W: Color / Black & white switch

05-FLIP: Image flip

10. Specifications

LCD P	erformance						
Size		9.0 inches					
Resolution		1280×RGB×800					
Aspec	t ratio	16:9/4:3					
Color	system	NTSC/PAL					
Brightr	ness	250cd/m ²					
Contra	ıst	700:1					
Color		16.77 million colors					
Viewin	g angle	H/V:140/120					
Video	Format						
	SMPTE-425M **	1080p (60 / 59.94 / 50)					
	SMPTE-274M	1080i (60 / 59.94 / 50)					
	SIVIP I E-2/4IVI	1080p (30 / 29.97 / 25 / 24 / 23.98)					
SDI *	SMPTE-RP211	1080psf (30 / 29.97 / 25 / 24 / 23.98)					
	SMPTE-296M	720p (60 / 59.94 / 50)					
	SMPTE-125M	480i (59.94)					
ITU-R BT.656		576i (50)					
		480I / 576I / 480P / 576P					
HDMI		1080i (60 / 59.94 / 50)					
HDIVII		720p (60 / 59.94 / 50)					
		1080p (60 / 59.94 / 50 / 30 / 29.97 / 25 / 24 / 23.98)					
General							
Working voltage		DC/ Battery 6.5V-17V					
Power consumption		DT-X91F ≤18W					
		DT-X91H ≤16W					
		DT-X91C ≤12W					
Working temperature		0℃~+40℃					
Working humidity		10%~90%					
Storag	e temperature	-15℃~+60℃					
	e humidity	10%~90%					
Dimen		236×171×48mm					
Net we	eight	970g					

^{*} DT-X91C doesn't support SDI input;

11. Packing List

1. Monitor	$\times 1$
2. User Manual	$\times 1$
3. Power adaptor	$\times 1$
4. Power cable	$\times 1$
5. Sun hood	$\times 1$
6. Screw ball head	$\times 1$
7. LCD protection film	$\times 1$

^{**} Only DT-X91H support SMPTE-425M format.



This model is manufactured, warranted and supported by SWIT Electronics Co., Ltd. / SWIT Electronics USA, LLC, and distributed in North America by JVC Professional Video Products.

To obtain service or for further information, please contact:

SWIT Electronics USA, LLC.

Address: 4300 Stevens Creek Blvd., Suite 230, San Jose, CA 95129
Toll free: 1 866 986-SWIT (7948) • Tel: 408 260-8258 • Fax: 408 228-8438

Email: info@swit.us • Website: www.swit.us

Version: 130308