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About This Guide

The User Guide is intended for anyone who needs to operate, configure, or troubleshoot the Explorer MX-HD Basic and Plus Mobile Digital Video Recording (DVR) System. In this guide, both the MX-HD Basic and MX-HD Plus are referred to as Explorer MX-HD. The individual models are referred to as MX-HD Basic and MX-HD Plus.

Related user guides include:

- *Explorer MX-HD Install and Setup Guide, 700-0159*
- *vMax View User Guide, 700-0137*

Conventions Used



CAUTION

Cautions identify conditions or practices that could result in damage to the unit or other equipment.

Recommendation: These notes provide tips for optimum performance of the DVR system.

Important: These notes provide important information, which are not as serious as a Caution.

Abbreviations and Acronyms

Acronym	Definition	Acronym	Definition
DVR	Digital Video Recorder	LAN	Local area network
FPS	Frames per second	MJPEG	Motion Joint Photographic Experts Group
GPS	Global Positioning System	MPEG-4	Moving Picture Experts Group
HD	High Definition	OSD	On Screen Display
HDD	Hard disk drive	RA	Return Authorization
H.264	H.264 video compression	TCM	Transmission Control Module
IPS	Images per second	TCP/IP	Transmission Control Protocol/ Internet Protocol
IR	Infrared	USB	Universal Serial Bus
		UTC	Universal Time Coordinated

Finding Information Online

You can find more information about Seon Design Inc. as well as its products and services at www.seon.com.

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CHAPTER 1

Introduction

This chapter describes the product features and components of the Explorer® MX-HD Basic and Plus Mobile Digital Video Recording System. This chapter contains the following sections:

Overview, on page 1–2

MX-HD DVR Product Features, on page 1–3

System Components, on page 1–4

Recording Capacity for DVR Hard Drive Storage, on page 1–5

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DVR Video Configuration Playback and Archiving, on page 1–11

1.1. Overview

This section introduces the product features of the Explorer® MX-HD Plus Mobile Digital Video Recording (DVR) System.

The Explorer® MX-HD DVR integrates with optional Smart-Reach Mobile wireless technology and works with optional vMax Commander and vMax View video management software for on-board video data management, as shown in [Figure 1-1](#).



Figure 1-1 MX-HD DVR System with Smart-Reach Mobile Wireless and vMax Commander Software

1.2. MX-HD DVR Product Features

The Explorer MX-HD DVRs contain the following features:

- supports up to 4 video channels and 4 audio channels
- has one high-definition video channel
- records up to 30 frames per second (FPS) at 720×480 D1 resolution on all video channels simultaneously
- H.264, MPEG-4, and MJPEG video compression
- has removable hard disk DVR drive
- stores up to 1 TeraByte (TB)
- offers dual stream recording; high-resolution stream for playback on a PC, or lower resolution stream for viewing over a cellular phone network
- uses Global Positioning System (GPS) technology for Geo-fencing, to designate a geographic boundary for the vehicle and provides an alert if the vehicle leaves the area
- authorized personnel only restricted access to DVR via keyed Security front cover and secure cable cover with slotted cable entries, as shown.

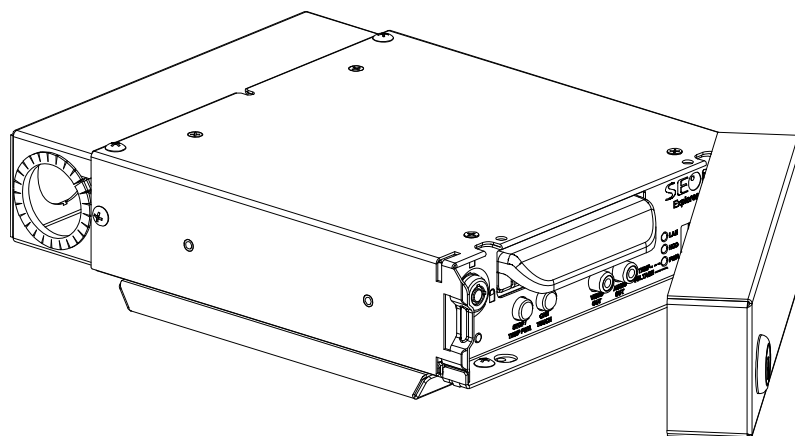


Figure 1-2 MX-HD DVR with Security Front Cover and Secure Cable Cover

- mounting options that can accommodate horizontal or vertical installation
- configure, playback, and archive video from the DVR locally with trackball mouse, monitor, and DVR On Screen Display (OSD)
- configure, playback, and archive video from the DVR remotely with vMax Web via Ethernet connection
- interfaces with network using the RJ-45 connections on the back panel, see [Figure 1-4](#)

1.2.1. System Components

The typical MX-HD system consists of the following components (see [Product Interface and Devices, on page 1–7](#)):

- Explorer MX-HD DVR and hard drive
- Analog cameras and camera cables, one per camera
- HD camera and Power over Ethernet Injector
- Trackball mouse
- Alarm input switch and cable
- Power input harness with in-line fuses for constant and switched power lines

The MX-HD Plus system consists of the following additional components:

- Smart-Link™ module
- Cables and harnesses:
 - ignition input harness
 - power input harness with in-line fuses for constant and switched power lines
 - alarms and signals harnesses
 - speed harness
- Diagnostic Button (optional)
- RGY Illuminator (optional)
- GPS (Global Positioning System) receiver (optional)
- Smart-Reach Wi-fi (optional)
- XELR-8 G-Sensor (optional)
- Portable video monitor (optional)

See [Recording Capacity for DVR Hard Drive Storage, on page 1–5](#).

1.2.2. Recording Capacity for DVR Hard Drive Storage

The Explorer MX-HD uses MPEG-4 (for analog cameras), H.264 and MJPEG (for an HD camera) video compression to extend the recording time on the hard drive. The recording time varies, depending on the settings for frames per second (speed), resolution (pixel count), and picture quality. The picture quality setting determines the amount a picture is compressed versus the amount of memory the picture takes up on the hard drive.

- A lower picture quality of setting 1, for example, means higher compression and a lower memory requirement.
- A higher picture quality of setting 4, for example, means lower compression and a higher memory requirement.

1.2.2.1. Estimated Recording Times

[Table 1-1](#) to [Table 1-7](#) show the estimated recording time in hours for a 750 GB Hard Drive at different settings, including Record 2 set at 5 FPS, (3) 360x240.

Important: The average image size is dependent on the scene content, amount of motion, and the lighting conditions. Actual recording times will vary greatly.

Table 1-1 MX-HD— Estimated Recording Times for 1 HD Camera

FPS	Picture Quality* (3), 720p (1280 x 720)
30	481 hours
15	865 hours
10	1286 hours
5	1843 hours

Table 1-2 MX-HD— Estimated Recording Times for 1 HD and 1 Analog Camera

FPS	Picture Quality* (3), 720p (1280 x 720)		
	CIF (360x240)	Half D1 (720x240)	D1 (720x480)
30	435 hours	390 hours	355 hours
15	784 hours	730 hours	666 hours
10	1150 hours	1033 hours	925 hours
5	1663 hours	1559 hours	1462 hours

Table 1-3 MX-HD— Estimated Recording Times for 1 HD and 2 Analog Cameras

FPS	Picture Quality* (3), 720p (1280 x 720)		
	CIF (360x240)	Half D1 (720x240)	D1 (720x480)
30	397 hours	328 hours	281 hours
15	716 hours	632 hours	542 hours
10	1040 hours	863 hours	722 hours
5	1515 hours	1351 hours	1212 hours

Table 1-4 MX-HD— Estimated Recording Times for 1 HD and 4 Analog Cameras

FPS	Picture Quality* (3), 720p (1280 x 720)		
	CIF (360x240)	Half D1 (720x240)	D1 (720x480)
30	338 hours	249 hours	198 hours
15	611 hours	498 hours	394 hours
10	873 hours	649 hours	502 hours
5	1286 hours	1067 hours	903 hours

Table 1-5 MX-HD— Estimated Recording Times for 1 Analog Camera

FPS	Picture Quality* (3)		
	CIF (360x240)	Half D1 (720x240)	D1 (720x480)
30	4518 hours	2066 hours	1349 hours
15	8333 hours	4688 hours	2896 hours
10	10870 hours	5245 hours	3289 hours
5	17045 hours	10135 hours	7075 hours

Table 1-6 MX-HD— Estimated Recording Times for 2 Analog Cameras

FPS	Picture Quality* (3)		
	CIF (360x240)	Half D1 (720x240)	D1 (720x480)
30	2259 hours	1033 hours	674 hours
15	4167 hours	2344 hours	1448 hours
10	5435 hours	2622 hours	1645 hours
5	8523 hours	5068 hours	3538 hours

Table 1-7 MX-HD— Estimated Recording Times for 4 Analog Cameras

FPS	Picture Quality* (3)		
	CIF (360x240)	Half D1 (720x240)	D1 (720x480)
30	1130 hours	517 hours	337 hours
15	2083 hours	1172 hours	724 hours
10	2717 hours	1311 hours	822 hours
5	4261 hours	2534 hours	1769 hours

* As set in the DVR's Camera Settings and Record2 Settings configuration menus.

1.3. Product Interface and Devices

This section describes the features of the DVR (front and back panels) and the trackball mouse.

1.3.1. DVR Front Panel Features

The MX-HD DVR front panel features are shown in [Figure 1-3](#) and briefly described in [Table 1-8](#). For a detailed description of the front panel features, see [Table 1-8, Front Panel Features, on page 1-7](#).

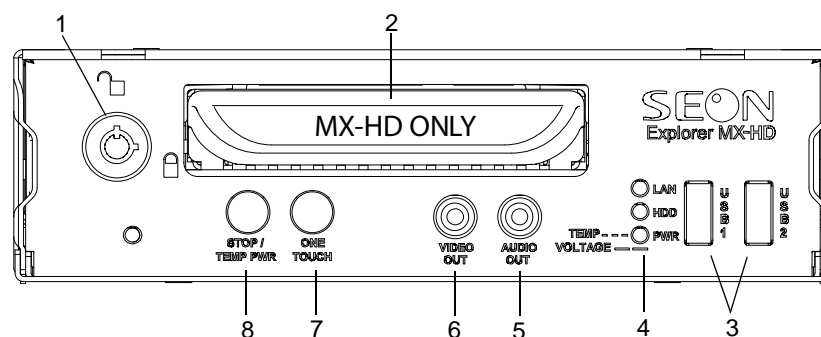


Figure 1-3 Explorer MX-HD Front Panel

Table 1-8 Front Panel Features


Item	Feature	Description
1	DVR Drive lock	<p>Requires the DVR drive key to unlock and remove the DVR hard drive. See Remove and Replace the DVR Hard Drive, on page 2-2 for hard drive removal details.</p> <p>When the DVR is recording, turn the hard drive key to the open position. The DVR HDD Activity LED blinks while the recordings are stopping. After ten seconds or until the red HDD activity indicator is off, gently pull out the hard drive.</p> <p></p> <p>CAUTION: Data Loss Do not remove the DVR hard drive until 10 seconds after power to the hard drive is turned off and the red HDD activity indicator is off. Failure to do so may result in lost data.</p>
2	DVR Hard Drive	<p>Remove the hard drive to a separate location for playback using the TL/MX Drive Interface connected to a PC. Notice that the MX-HD hard drive has a label on the handle to identify it is for this DVR series. Placing the MX-HD hard drive in a TL series DVR and vice versa will result in lost data. See Remove and Replace the DVR Hard Drive, on page 2-2 and Figure 2-1 on page 2-3.</p>

Table 1-8 Front Panel Features

Item	Feature	Description
3	USB1, USB2 ports	Supports USB devices for: <ul style="list-style-type: none"> • Copying video and audio information. • Exporting video clips. • Updating the DVR firmware. • Importing/exporting. • Connecting the trackball mouse.
4	LAN activity (green)	Illuminates when there is network activity on the local area network connection.
	HDD activity (red)	Illuminates when the DVR is accessing the hard drive.
	PWR indicator (green) TEMP --- VOLTAGE — —	Illuminates when the DVR is powered on. Flashes quickly when the DVR cannot power up due to temperature limitations. Flashes slowly when the DVR cannot power up due to voltage limitations.
5	AUDIO OUT (red)	Audio output RCA jack.
6	VIDEO OUT (yellow)	Video output RCA jack for configuring the DVR and viewing recorded video.
7	ONE TOUCH	Press to start ONE TOUCH downloading to portable media installed in USB port. See Using One-Touch Download , on page 2–14.
8	STOP/TEMP PWR (red button)	<ul style="list-style-type: none"> • Powers on the DVR for five minutes if held for more than 5 seconds. • Powers down the DVR if held for more than 5 seconds when the DVR is in temporary power mode, or in shutdown sequence and the ignition is off. • Press the STOP button to temporarily stop the DVR from recording or playing.

1.3.2. DVR Back Panel Features

The MX-HD DVR back panel is shown in [Figure 1-4](#) and described in [Table 1-9](#).

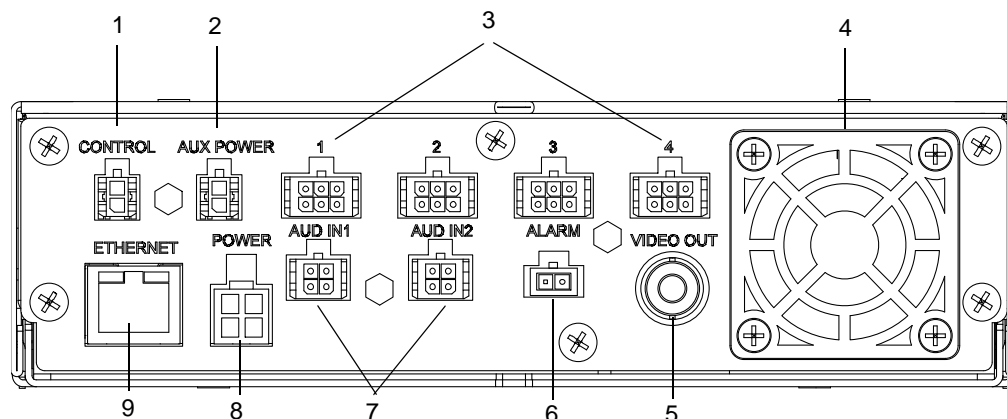


Figure 1-4 Explorer MX-HD Back Panel

Table 1-9 Back Panel Features

Item	Feature	Description
1	CONTROL	Control connector (2-pin) controls the Smart-Reach® Mobile wireless bridge equipment.
2	AUX POWER	Auxiliary power connector (2-pin) turns off after Record Delay Off settings.
3	1, 2, 3, 4	Four camera input connectors (6-pin)
4	Fan	Intake fan with filter and removable cover. See Maintenance and Troubleshooting , on page 5-1.
5	VIDEO OUT	Configurable video output for viewing video.
6	ALARM	Alarm input connector for the alarm button and cable (2-pin).
7	AUD IN1, AUD IN2	Audio input connectors with power mapped to Audio Channels 1 and 2 (4-pin).
8	POWER	Power input connector (4-pin) for connecting the power harness.
9	ETHERNET (Gigabit)	Ethernet port with RJ-45 connector for connecting to HD Camera or LAN. Ethernet is used to connect either to a POE Injector for a CHW HD Camera, PC, or Smart-Reach wireless bridge and other equipment.

1.3.3. Trackball mouse



Figure 1-5 Trackball Mouse Pointing Device

Table 1-10 Trackball Mouse Features

Item	Description
1	Click to select the highlighted option using index finger.
2	Click to select the highlighted option using thumb control.
3	<ul style="list-style-type: none">• Delete a character entered into a field.• Perform the function of the Back button.
4	Moves the cursor around the screen.

Many other USB mice will also work with the DVR.

1.4. DVR Video Configuration Playback and Archiving

There are three ways of accessing MX-HD DVR content playback and archiving features:

- locally via OSD, mouse, and portable video monitor, see [DVR Operation, on page 2-1](#).
- remotely via vMax Web browser interface and Ethernet/wireless connection, see [vMax Web Remote Operation, on page 3-1](#).
- via vMax View video management software and DVR hard drive interface, see [vMax View and the Hard Drive Interface, on page 2-3](#). See also:

Explorer MX-HD DVR Install and Setup Guide, 700-0159

vMax View User Guide, 700-0137

The following table shows which methods support video configuration, playback, and archiving.

To do this...	Use...		
	On-screen display with monitor and trackball mouse	vMax Web remote access with Internet Explorer	DVR Hard Drive Interface & vMax View
Configure the DVR menu settings.	✓	✓	
View live and playback recorded analog camera video with single channel view or multiple views.	✓	✓	✓
Playback recorded HD camera video in single channel view or with multiple views.	x	✓	✓
Search for video from a Segment, an Events list, or by time and date.	✓	✓	✓
Archive video to .avr file format.	✓	✓	✓
Archiving options — each individual channel can be archived as an .avi file and individual images saved to .bmp or .jpg files		✓	✓

CHAPTER 2

DVR Operation

This chapter provides information and procedures for operating the MX-HD. This chapter contains the following sections:

[Remove and Replace the DVR Hard Drive, on page 2-2](#)

[Search, Playback, and Archive Video, on page 2-2](#)

[vMax View and the Hard Drive Interface, on page 2-3](#)

[On Screen Display Access, on page 2-4](#)

[Using the Search Function, on page 2-8](#)

[Using the Archive Function, on page 2-11](#)

[Copy to USB, on page 2-13](#)

[Using One-Touch Download, on page 2-14](#)

2.1. Remove and Replace the DVR Hard Drive

The DVR has a removable hard drive that is contained in a hard drive tray. A hard drive lock secures the cartridge during operation. Use the hard drive key to lock and unlock the hard drive.



CAUTION: Data Loss Risk

Do not remove the DVR hard drive until the red HDD activity indicator is off. Failure to do so may result in lost data. While the DVR hard drive is hot swappable (the drive can be removed when the DVR is powered up), do not remove the DVR hard drive while the DVR is recording, as some video segments may not be recorded.

To remove the hard drive:

1. Insert the hard drive key.
 2. Turn the hard drive key counter clockwise by $\frac{1}{4}$ turn until the hard drive lock is in the unlocked position.
 3. After the red HDD LED is off, gently pull out the hard drive.
-



CAUTION: Hard Drive Identification

Notice that the MX-HD hard drive has an identifying label to identify it as for this DVR series. Placing the MX-HD hard drive in a TL series DVR and vice versa will result in lost data.

To replace the hard drive:

1. Slide in a hard drive until the cartridge seats inside the front panel.
2. Insert the hard drive key, turn clockwise by $\frac{1}{4}$ turn until the hard drive lock is in the locked position.

2.2. Search, Playback, and Archive Video

The HD camera output is visible from vMax Web and vMax View, but not in the DVR onscreen monitor view. To search, playback, and archive recorded video, use one of three methods:

vMax View and DVR hard drive Interface

Remove the DVR hard drive from the DVR, and use the Harddrive Interface and vMax View software. See [vMax View and the Hard Drive Interface, on page 2-3](#).

On Screen Display Menus

For local video access, connect a portable video monitor to the TL DVR. Use the trackball mouse to navigate the OSD menus. See [On Screen Display Access, on page 2-4](#).

vMax Web Menus

For remote video access, use a laptop and the vMax Web browser user interface with Ethernet connectivity. Video recorded with the HD camera is only available for playback via vMax Web if the DVR's Ethernet port is connected to a network. See [vMax Web Remote Operation, on page 3-1](#).

2.3. vMax View and the Hard Drive Interface

The Harddrive Interface is provided with vMax View software to accommodate the MX-HD hard drives. The hard drive interface uses two USB connectors to work with power from the PC.

To access video from the hard drive using vMax View:

1. Remove the hard drive from the DVR.
2. Connect to the USB ports on a PC or laptop with vMax View installed, as shown in Figure 2-1.

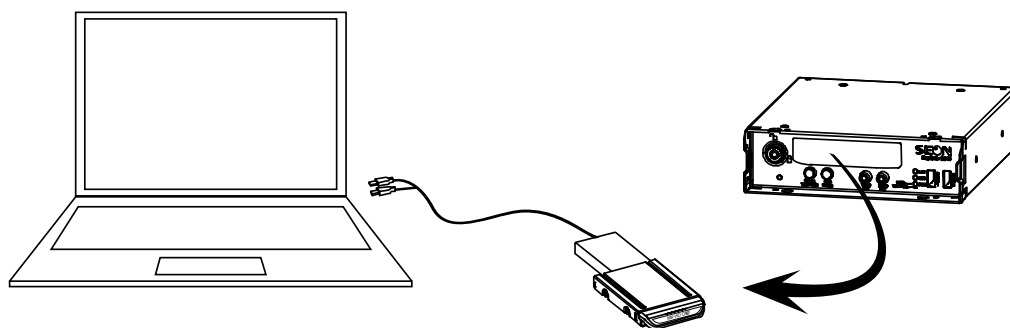


Figure 2-1 Harddrive Interface with Hard Drive

3. Open the vMax View software to search, playback, and archive DVR hard drive contents.

vMax View sees the information read from the DVR hard drive.

See *vMax View User Guide 700-0137* for detailed procedures.

2.4. On Screen Display Access

Use the On-Screen Display mode to locally access the DVR hard drive content and menus.

To use the on-screen display (OSD) with trackball mouse and monitor:

1. Connect a portable video monitor to the VIDEO OUT RCA jack on the MX-HD front panel. Plug the USB trackball or mouse in the USB socket on the front of the DVR.

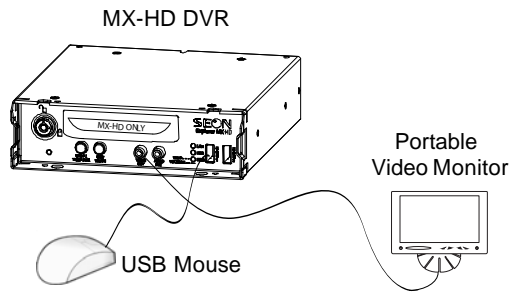


Figure 2-2 Mouse and Monitor Attached to the DVR

When the on-screen display starts up, the Seon Explorer® MX-HD splash screen appears briefly before the DVR enters live view.



Figure 2-3 MX-HD Splash Screen

During recording and live viewing, the screen information is dynamic and can include the items shown in Figure 2-4 and described in Table 2-1. The screen items can be configured in the main menu.



Figure 2-4 On-Screen Display during Live Viewing and Recording

Table 2-1 On-Screen Display Information

Feature	Description
Camera 1 to Camera 4	Camera titles, maximum 8 characters each.
Main_Title	Main title of the DVR, maximum 32 characters.
HD Size	Formatted size of the DVR hard drive, in gigabytes (GB).
HD Used	Percentage of recorded video on the DVR hard drive. At 100%, the message displayed depends on the Repeat Record settings in the Recording Settings menu. <ul style="list-style-type: none"> • When Repeat Record is set to On, the HD Used message reads “N/A Repeating”. N/A means that information on how much of the hard drive space is used is not available because the hard drive is full. Repeating means the DVR continues recording, overwriting the oldest recorded data. • When Repeat Record is set to Off, the HD Used message reads “100%”. The DVR stops recording.
Version	DVR firmware version. To update, see Firmware Updates, on page 4–2 .
Status	DVR operation status: <ul style="list-style-type: none"> • LIVE (live mode not recording) • PLAYBACK (the DVR is playing locally, displays RECORD, ALARM, or TIMER) • RECORD (normal recording) • ALARM (alarm recording) • TIMER (timer recording) • V. LOSS (video loss or camera signal loss)
Speed Display	Vehicle speed.
Voltage	System voltage from 8 to 32 VDC.
Temperature	DVR temperature in degrees Fahrenheit or Celsius.
GPS	If the GPS receiver is installed, the vehicle’s latitude and longitude is displayed.
Time and Date	Current/recorded time and date.
AC (Alarm count)	Count of alarm(S) triggered. Resets to 0 when the DVR is restarted.
IG (Ignition)	Appears when vehicle ignition is on.

2. Use the trackball mouse (right-click) to access the DVR’s configuration, playback, and archiving menu settings as required.
3. Proceed to the Configuration or Operation and Playback chapters for details on available setting options.

2.5. Playback Menu Access

Use the Playback menu to search, playback, and archive video directly from the DVR hard drive.

To access the playback menu:

1. In the OSD view, right-click the live view to access the Main Menu and click Playback.

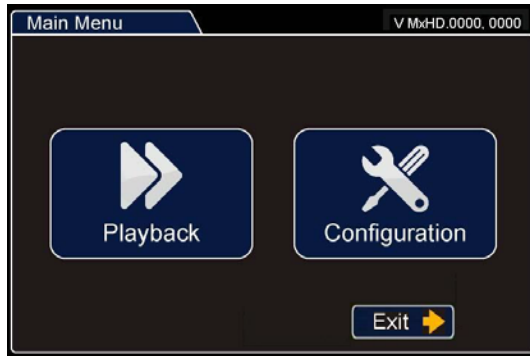













Figure 2-5 Main Menu

2. Click on the Show/Hide toolbar icon  in the center of the window. The Playback tool bar appears.



Figure 2-6 Playback Tool Bar Menu


Table 2-2 Playback Tool Bar Items

Tool Bar Icon		Description
	Start of clip/End of clip	Click to set the start and end of clip points for Archiving. See page 2–11.
	Search	Click to search by Date, Time, Alarm, Signals, or System Event.
	Archive	Click to display the Archive window to save a video clip to a USB device.
	Fast Rewind	Click to reverse during playback. With playback paused, each click reverses the video by one frame.
	Play/Pause	Click to start playback. Click again to pause playback.
	Fast Forward	Click to fast forward during playback. With playback paused, each click advances the video by one frame.
	Individual camera/Quad view	Click to display Camera 1, 2, 3, 4 or quad view.
	Audio	Click to cycle through Audio 1, 2, 3 or 4.
	Metadata Text overlay	Click to turn on text overlay: temperature, system voltage, GPS data (if recorded), speed, date, and time.
	Show/Hide Playback tool bar	Click to show or hide the playback tool bar.
	Exit	Click to exit to on-screen display.

2.5.1. Using the Search Function

The MX-HD includes a powerful search function that lets you quickly find recorded information by Date and Time, Alarm, Signals, and by System Event.

To view the Search menu:

1. From the Main Menu, click on the Search  icon.

The Search menu appears as shown in Figure 2-7. The items appearing in the dialog box will depend on the item selected in Search Only box.



Figure 2-7 Search Menu

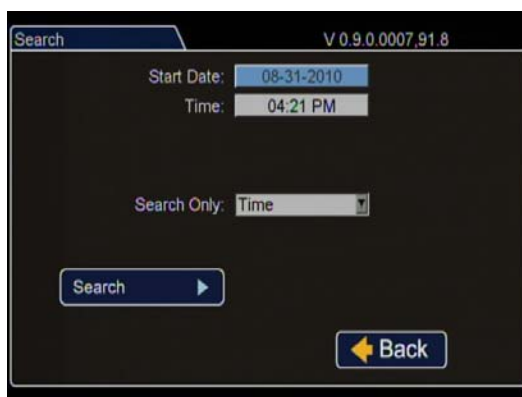
Table 2-3 Search Configuration Items

Menu Item	Description	Value [Default]
Start Date	Set the start date for the search.	
Time	Set the start time for the search.	
Search Only	Select the desired search type.	<ul style="list-style-type: none"> • [Time] • Alarm <ul style="list-style-type: none"> • Alm1, Alm2, Alm3, Alm4, All • Signals <ul style="list-style-type: none"> • Signal1, Signal2, Signal3, Signal4, Signal5, All • System Event <ul style="list-style-type: none"> • An Alarm event, <i>n</i> = alarm input • Dn Hard Drive over temperature warning, <i>n</i> = disk number • GPS = geo fence event • LH Logical head: beginning of recording date and time after hard drive has been overwritten • LUn Logical user login <i>n</i> = 1 is Administrator, 2 is Operator, 3 is General • PH Physical head: Beginning point of hard disk space • PL Power loss • RUn Remote user login through HTTP, <i>n</i> = user level • Sn Signal, <i>n</i> = signal input • Tn Scheduled recording • TN • Vn Video loss, <i>n</i> = camera • All
Search	Press Enter to Start Search.	

Table 2-4 DVR Events Description

Event	Description
Almn Off	Alarm Off
Almn On	Alarm On
GPS	Crossed GPS Fence
IG0	Ignition off
IG1	Ignition on
LIVE	DVR changes to live mode
PLoss	Power Loss
Rec On	Normal Recording event
RUn	Remote User Login n
Signaln	Signal Event n
Vlossn	Video loss on channel n

- Click the Start Date and Time fields to set the search ranges. Click Search.

**Figure 2-8** Search Menu

Depending on the item selected in the Search Only box, the MX-HD will retrieve recorded video. For example, select Time or Alarms, Signals or System Event to display the recorded video at the time point selected.

Event No.	Start Date / Time	Event Type
1	10-13-2009 01:03:39 PM	RU1
2	10-13-2009 01:03:05 PM	TN
3	10-13-2009 01:02:35 PM	TN
4	10-13-2009 01:01:55 PM	TN
5	10-13-2009 01:00:09 PM	RU1

Prev Pg Next Pg 1/1 Play ▶ ◀ Exit

Figure 2-9 Event List

- From the Event List, select the required list item.
- Click Play to review the video. Note the time when the event occurs and which camera captures the event details.




Figure 2-10 Playback View

2.5.2. Using the Archive Function

An archive dialog box lets you specify the start and end date and time of the video clip to be archived to a USB memory device.

To view the Archive menu:

1. From the Playback tool bar, click on the Archive  icon.

The Archive menu appears as shown in Figure 2-7. The items appearing in the dialog box depend on the item selected in the Filter By drop down menu.



Figure 2-11 Archive Menu

Table 2-5 Archive Configuration Items

Menu Item	Description	Value [Default]
Start Date	Set the start date (month, day, and year) for the archive clip.	[Current]
Time	Set the start time for the archive clip.	[1hour before current time]
End Date	Set the end date (month, day, and year) for the archive clip.	[Current]
Time	Set the end time for the archive clip.	[Current time]
Filter By:	Filter recorded data by one of three types.	<ul style="list-style-type: none"> • Time • Alarm Data • Log File
Copy to USB	Click to archive the video clip to USB memory device.	

To establish an archive clip:

To archive a clip using the one touch download, you must have the One touch settings (in the system settings menu) set to "Clip". See Figure 2-12.



Figure 2-12 One-Touch Settings: clip

1. Use the video playback or search controls to view the start date and time of the video you want to archive.



2. Click start of clip icon to set the start point of the archive clip.

3. Locate the end of the video you want to archive in Play mode, and click Pause.



4. Click end of clip icon to set the end point of the archive clip.

5. Press the ONE TOUCH button on the DVR front panel.

The One-Touch Process menu appears. The archive clip is saved to the USB memory device.

2.5.3. Copy to USB

To copy video files to a USB memory device:


1. Insert a USB memory device into an open USB port on the DVR front panel.
2. In the Playback tool bar, click the archive icon  to display the Archive screen.
3. Select the archive start and end date and time.
4. Click on Copy to USB to start archiving.
A progress bar appears.
5. Remove the USB drive when complete and return to the Archive screen.



Figure 2-13 Copy to USB Progress Bar

2.5.3.1. Archive Segmentation

Archives larger than 2GB are segmented when downloaded from the DX, MX, TX, and TL series DVRs. The segments are saved as separate archive files with the following naming convention:

- Archive.avr (original)
- Archive-002.avr (next segment)
- Archive-003.avr (next segment)

If your archive seems too short it could have been segmented.

vMax View will automatically stitch together segmented archive video when played.

2.6. Using One-Touch Download

Use the One-Touch download for downloading specific recorded information to a USB drive via the USB port. One-Touch download is available when the DVR is on and in live, playback, or record mode. Use the ONE TOUCH button on the DVR. Video is downloaded in the Seon proprietary DVR hard drive format and can be viewed and archived with the vMax View application. See the *vMax View User Guide*, 700-0137.

Recommendation: Retrieving several minutes or hours of video may take a long time. For large volume video transfers, retrieve the hard drive from the DVR and view the video playback via the vMax View software.

The default setting for One-Touch download is Alarms. See the One Touch Settings menu in the MX-HD DVR Installation and Configuration Guide, 700-0159, for details on setting the menu to Clip to enable One-Touch downloads.

To use the One-Touch download option:

1. If the DVR is powered off, press STOP/TEMP PWR for five seconds to power up DVR.

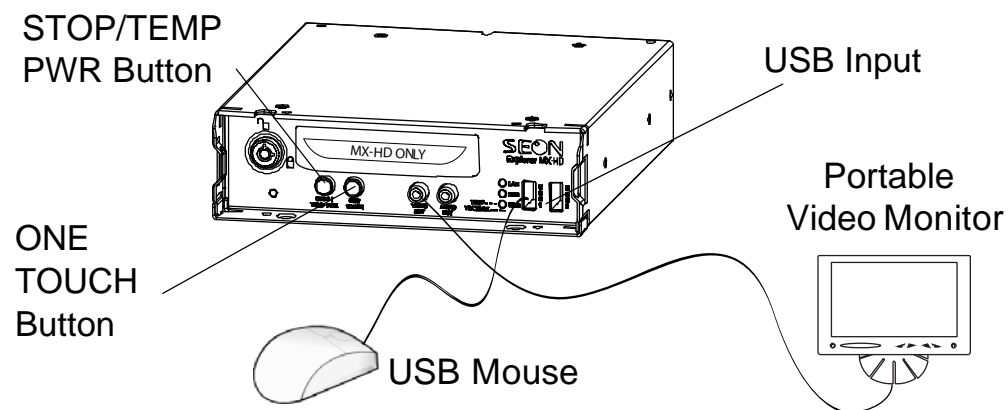


Figure 2-14 Mouse and Monitor Connected to DVR

2. When the DVR is on, connect a portable video monitor to VIDEO OUT on the DVR front panel.
3. Insert a USB memory device into the USB port on the DVR front panel.
4. Press the ONE TOUCH button to download information to the USB drive.

The on-screen display indicates download in progress. The screen shows the USB device size and the data file size.

The information that is downloaded is pre-selected by the settings for one touch download button behaviour.

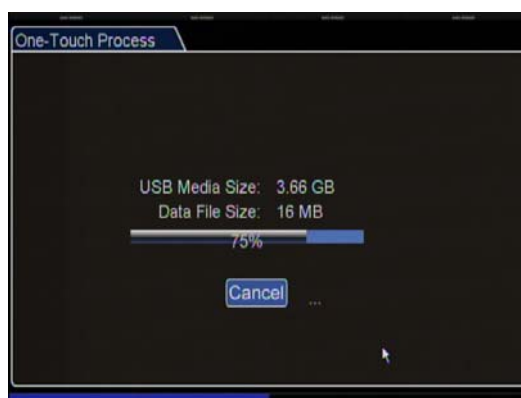


Figure 2-15 One-Touch Progress

When transfer is complete, the on-screen display closes.

5. Remove the USB drive.
6. To power off the DVR immediately, press STOP/TEMP PWR for five seconds. The DVR will power off automatically after five minutes.

CHAPTER 3

vMax Web Remote Operation

This chapter provides information on using vMax Web to remotely access the MX-HD DVR for viewing live or recorded video and archiving recorded video.

This chapter contains the following sections:

[System Requirements, on page 3-1](#)

[Accessing vMax Web, on page 3-2](#)

[vMax Web User Interface, on page 3-4](#)

[vMax Web Live Tab, on page 3-5](#)

[vMax Web Configuration Tab, on page 3-6](#)

[vMax Web Playback Tab, on page 3-7](#)

[vMax Web Archive Tab, on page 3-12](#)

[Viewing MX-HD Video Archives, on page 3-13](#)

3.1. System Requirements

The following minimum system requirements are necessary to access DVRs with vMax Web:

Table 3-1 Minimum System Requirements

Computer/Processor	<ul style="list-style-type: none"> • Intel Core® I5 or greater • High performance video card with DirectX Ver. 10 or higher support • 1280 × 1024 monitor resolution • 32 bit color quality • Sound card and speakers • USB 2.0 • 1 GBit Ethernet adaptor
Operating Systems	Windows® XP Service Pack 3, Windows Vista™, or Windows 7 (32-bit and 64-bit versions) Microsoft .NET Ver. 3 or higher support
Web browser	Internet Explorer® Version 8 or 9 (32 bit versions only)
Memory	2GB RAM or more available to the program (4GB or more total) recommended
Disk Space	10GB of available hard-disk space (depending on the amount of video to be stored locally)
Drive	CD/DVD writer drive and software if the archives to be stored on CD/DVD media

3.2. Accessing vMax Web

When the MX-HD DVR is connected to the network, users can remotely access the DVR over the web to view, playback, and archive video as well as configure the DVR.



CAUTION: System Access Restriction

DVR menu access is restricted to persons with system access permission. If you require permission to access configuration settings, contact your system administrator.

NOTE: The default network settings allow for connection to a laptop computer for configuration and usage of the DVR only. For remote network access, consult with your IT staff or Seon Design to configure the DVR to be on the same sub net as the laptop..

To access vMax Web

1. On a PC with an Ethernet connection to the DVR, right click the Internet Explorer 8 or 9 icon and select Run as Administrator.

Windows may prompt for confirmation.

NOTE: vMax Web is not compatible with 64-bit versions of Internet Explorer. Internet Explorer should be set to default settings. If firewall security, access restrictions, or custom IE settings are applied, they may adversely affect vMax Web performance. vMax Web is not compatible with browsers other than Internet Explorer.



CAUTION: System Access Restriction

It is assumed that archiving is performed by users with administration level login permissions, and that the computer, network, and Internet Explorer 8 have been configured to enable archiving and downloading video files. If you require permission to access computer, network, and Internet Explorer 8 configuration settings, contact your system administrator.

2. In the browser tray, confirm that Protected Mode is Off, as shown in [Figure 3-1](#).

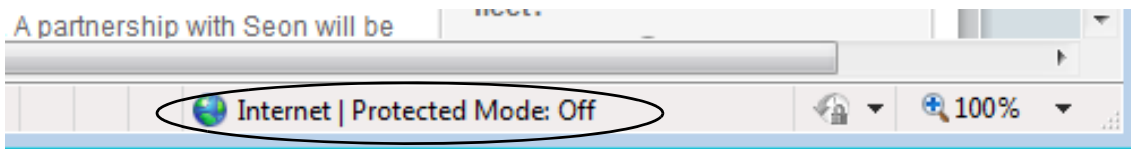


Figure 3-1 Internet Explorer Protected Mode: Off

3. In the browser's URL field, enter the DVR IP address from the Network Settings menu.

The default DVR IP address is **http://169.254.1.1**, as described in the *Explorer MX-HD Installation and Configuration Guide 700-0159*.

4. On the keyboard, press Enter.
5. At the prompt, enter the user name and password.

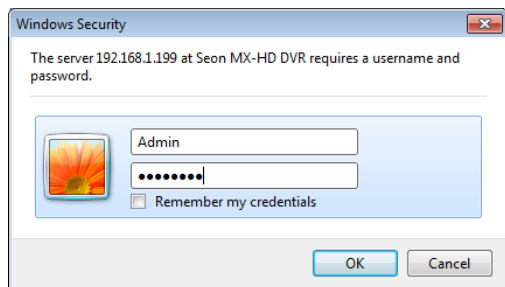


Figure 3-2 vMax Web DVR Login Prompt

The default user name is Admin.

The default password is 11111111.

Login data can be edited in the DVR Configuration > Network> User Levels menu.



CAUTION: System Access Restriction

DVR user names and passwords are provided by Seon Design with specific permissions assigned depending on user requirements. If you require permission to access DVRs, contact your system administrator.

6. Click OK.
vMax Web opens.

NOTE: The first time a computer connects to this model of DVR, or when users are not running in administrator mode, they may be prompted to confirm installation, as shown.

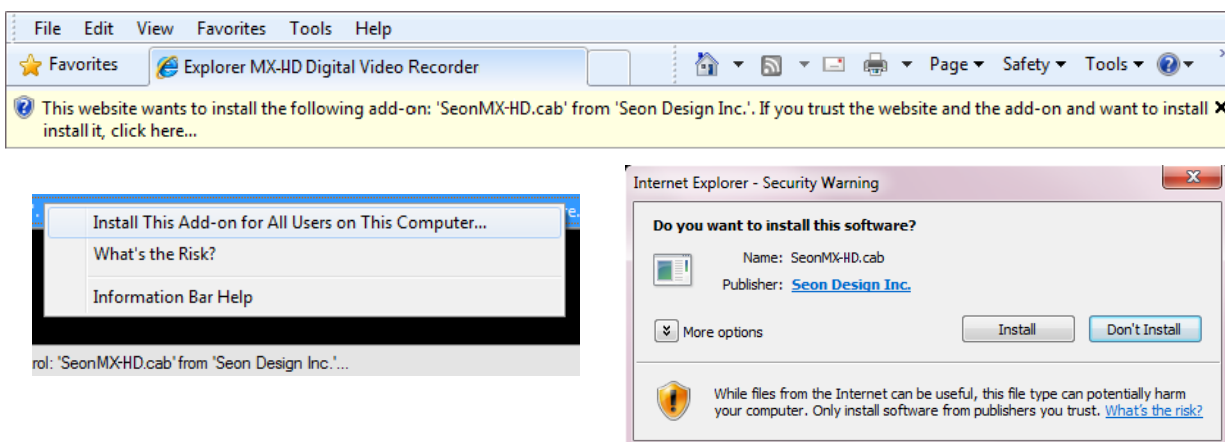


Figure 3-3 Windows Warnings

3.3. vMax Web User Interface

vMax Web opens with the Live tab selected and live video from the MX-HD cameras display.

By default, vMax Web will stay active for 10 minutes after you last used it and then close the connection to the DVR. If you have a file saving menu open and are downloading an archive, this does not apply. This vMax Web Timeout time can be adusted in the Configuration tab's System menu.



Figure 3-4 vMax Web User Interface

Table 3-2 User Interface Components

ID	Description
1	Tab area. <ul style="list-style-type: none"> • Live tab — live DVR video display and viewing controls • Configuration tab — DVR setup menus • Playback tab — search recorded DVR video • Archive tab — archive recorded DVR video
2	Viewing Area — view multiple or single cameras and telemetry information
3	User login name
4	DVR firmware version
5	Overlay information — DVR configurable; camera title, date and time
6	DVR information — DVR ID, firmware version, and operating status
7	Telemetry information — DVR location, speed, and hard drive temperature

3.3.1. vMax Web Live Tab

Upon login, vMax Web opens with the Live tab selected, as shown. .

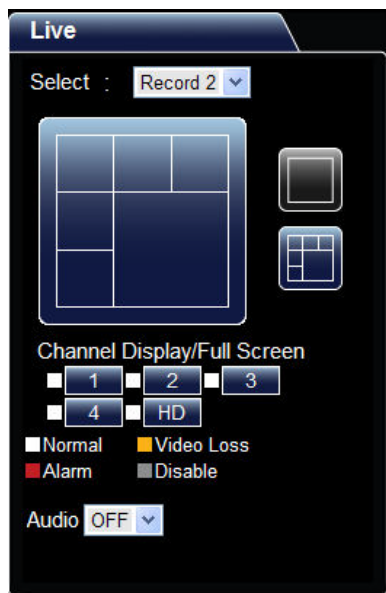


Figure 3-5 Live tab

NOTE: The CHW HD Camera output cannot display in live mode because the Ethernet port is required for network access.

To setup the Live tab view

1. In the Select drop down menu, select the Record 2 or Record video stream.

The Explorer MX-HD DVR records two streams of video, one for low bandwidth remote viewing, and one with higher video speed, quality, and resolution settings for creating archives. When accessing the DVR with vMax Web, the Record 2 video stream is selected for use with low bandwidth connections while viewing live video.

Higher video speed, quality, and resolution settings will provide clearer pictures and will require more storage space and longer archiving time. These settings are adjustable in the Configuration tab's Record menu.

2. Use the Channel Display/Full Screen tools to display all or individual channels. Each camera's status is indicated by a color and explained in the color legend below the display buttons.
3. In the Audio drop down menu, select whether to have the Audio coming from one of the cameras or off.

3.3.2. vMax Web Configuration Tab

The Configuration tab contains menus specific to DVR features and setting options. Features vary depending on the DVR model used.

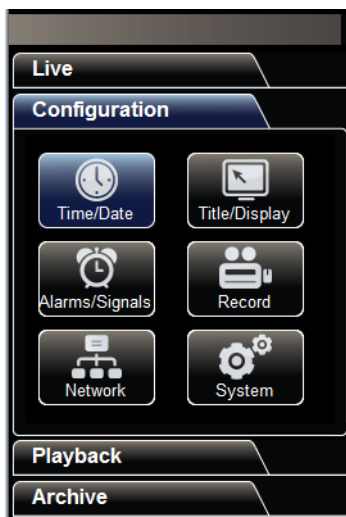
The vMax Web configuration menus are similar to the DVR OSD menus. See the MX-HD DVR Installation and Configuration Guide, 700-0159, for specific details when configuring DVR function settings.



CAUTION: System Access Restriction

DVR user names and passwords are provided by Seon Design with specific permissions assigned depending on user requirements. If you require permission to access DVR configuration settings, contact your system administrator.

MX-HD DVR setup menus include:



- Time/Date
- Title/Display
- Alarms/Signals
- Record
- Network
- System

Figure 3-6 Configuration tab

NOTE: For each menu selected and edited, click Save to save the changes before clicking on other menus.

3.3.3. vMax Web Playback Tab

To search the recorded video, select the Playback tab as shown in Figure 3-7.

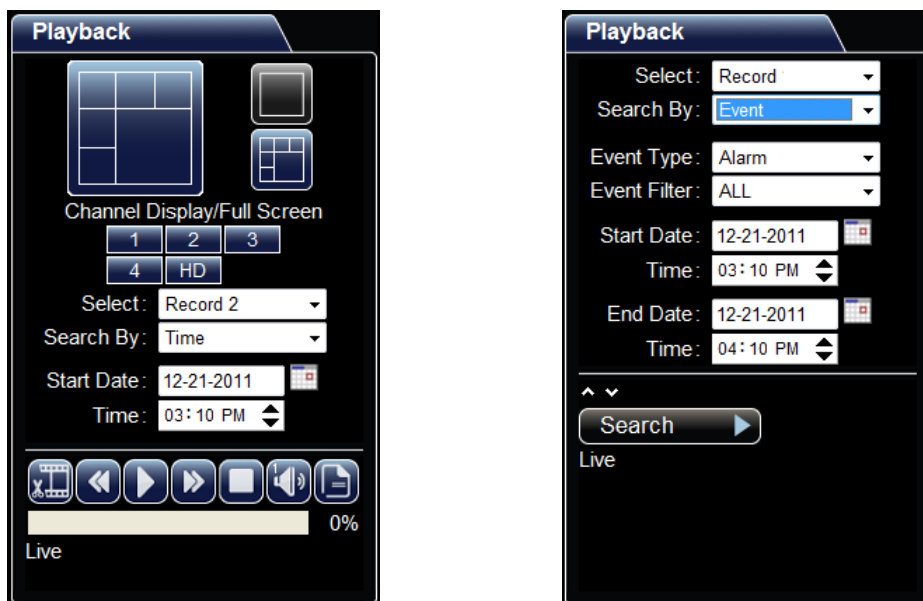


Figure 3-7 Playback tab views, searching by Time or Event

Table 3-3 Time Search Fields

Menu Item	Description	Value [Default]
Select	Choose which recording stream to search for video in. <ul style="list-style-type: none"> With Record selected, high resolution video is available for archiving. With Record2 selected, low resolution video is available for faster searching and remote playback. 	Record, [Record2]
Search By	Choose whether to search by the time the event occurred or by specific events.	[Time], Event
Start Date	Set the start date (month, day, and year) for the search.	[Current]
Time	Set the start time for the search.	[1 hour before current time]

Table 3-4 Event Search Fields

Menu Item	Description	Value [Default]
Select	Choose which recording stream to search for video in. <ul style="list-style-type: none"> With Record selected, high resolution video is available for archiving. With Record2 selected, low resolution video is available for faster searching and remote playback. 	Record, [Record2]
Search By	Choose whether to search by the time the event occurred or by specific events.	[Time], Event
Event Type	Enabled when Event is selected in Search By. Select the type of event to search for.	[Alarms], Signals, System Events
Event Filter	Enabled when Event is selected in Search By. Select the specific alarm to search for.	[ALL], ALM 1, ALM 2, ALM 3, ALM 4
Start Date	Set the start date (month, day, and year) for the search.	[Current]
Time	Set the start time for the search.	[1 hour before current time]
End Date	Enabled when Event is selected in Search By. Set the end date (month, day, and year) for the search.	[Current]
Time	Enabled when Event is selected in Search By. Set the end time for the search.	[Current time]

Table 3-5 DVR Events Description

Event	Description
Almn Off	Alarm Off
Almn On	Alarm On
GPS	Crossed GPS Fence
IG0	Ignition off
IG1	Ignition on
LIVE	DVR changes to live mode
PLoss	Power Loss
Rec On	Normal Recording event
RUn	Remote User Login n
Signaln	Signal Event n
Vlossn	Video loss on channel n

There are two ways to search the DVR for video:

- by the time an event occurred
- by alarm, signal or system events recorded by the DVR

To Search Video from a Time Point

1. Use the Channel Display/Full Screen tools to display all or individual channels. Each camera's status is indicated by a color and explained in the color legend below the 12 display buttons.
2. In the Select drop down menu, select the Record 2 or Record video stream.
The Explorer MX-HD DVR records two streams of video, one for low bandwidth remote viewing, and one with higher video speed, quality, and resolution settings for creating archives. When accessing the DVR with vMax Web, the Record 2 video stream is selected for use with low bandwidth connections while viewing live video.
Higher video speed, quality, and resolution settings will provide clearer pictures and will require more storage space and longer archiving time. These settings are adjustable in the Configuration tab's Record menu.
3. In the Search By drop down menu, select Time.
4. Click the Calendar icon to select a start date.
5. Select the start time of the recorded video to view.
6. Click the Play button.
The DVR begins playback of video from the designated or next available time point.
7. Use the play, pause, fast forward or reverse (up to 32x speed) controls to locate the event video.
8. Note the event start and end date and time for use on the Archive tab.

To Search Video from an Event Marker

1. Select Event in the Search By drop down menu.

The Event Type and Event Filter menus appear, as shown in Figure 3-7.

2. From the Event type menu, select an event type.
3. From the Event Filter menu, select a filter type.

Table 3-6 Event Search Fields

Event Types	Filters
Alarms	Alarms recorded that occurred within the selected time range are listed. Options include: <ul style="list-style-type: none">• Alarm 1-4 — as set in DVR Configuration menus, depending on DVR type• ALL — All alarms
Signals	Signals recorded that occurred within the selected time range are listed. Options include: <ul style="list-style-type: none">• Signal 1-10 — as set in DVR Configuration menus, depending on DVR type• ALL — All signals
System Events	Telemetry events recorded that occurred within the selected time range are listed. Options include: <ul style="list-style-type: none">• GPS — position data• Idle — when vehicle idles for longer than configured time, the event is recorded System events recorded that occurred within the selected time range are listed. Options include: <ul style="list-style-type: none">• Ignition — when vehicle ignition is engaged, the event is recorded• Recording — DVR is recording• Timers — as configured, when vehicle actions exceed preset timer ranges the event is recorded• Video Loss — when any camera is not detected, the event is recorded ALL — all recorded telemetry and system events that occurred within the selected time range are listed

4. Select a search range start and end date and time.
5. Click Search.

The progress bar appears while the events are located on the DVR.

6. From the list that appears in the View area, select an event and click Play. Windows may request to download an Active X control.

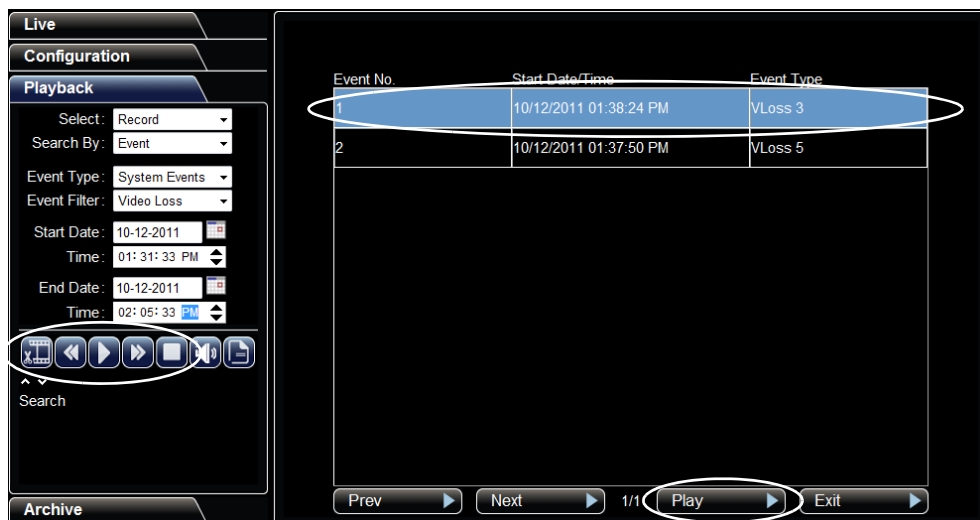


Figure 3-8 Playback Event Search Results

7. On the Playback tab area, use the play, pause, fast forward or reverse (up to 32x speed) controls to locate the video loss event. When reviewing the event list, you can also click on the first (Archive) playback icon to set the start and stop time and then archive from here
8. Using the displayed overlay information, note the specific event start and end date and time for archiving.
9. Click Stop to return to the Event list, if necessary.

3.3.4. vMax Web Archive Tab

To archive the specific recorded video, select the Archive tab as shown in Figure 3-9.

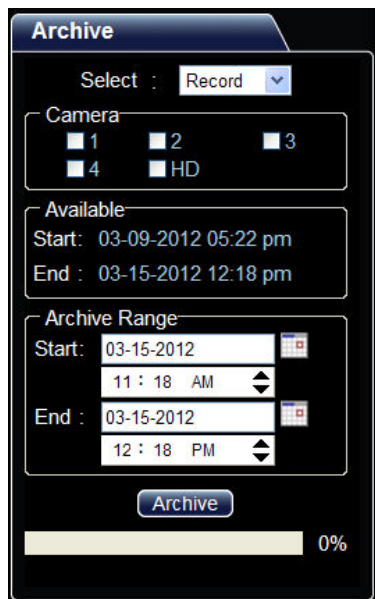


Figure 3-9 Archive tab

Table 3-7 Archive Tab Fields

Menu Item	Description	Value [Default]
Select	Choose which recording stream to search. <ul style="list-style-type: none"> With Record selected, high resolution video is available for archiving. (Recommended) With Record2 selected, low resolution video is available for faster searching and remote playback. (Not recommended) With Log File selected, the user can export a log file of all selected events to a text file. 	[Record], Record2, Log File
Camera	Select the camera(s) with the required recorded video.	1-4, HD
Available	Read only. This area displays the earliest and latest dates containing recorded video on the DVR hard drive.	Start, End
Start	Set the start date (month, day, and year) for the archive	[Current]
Time	Set the start time for the archive.	[1 hour before current time]
End	Enabled when Event is selected in Search By. Set the end date (month, day, and year) for the archive.	[Current]
Time	Enabled when Event is selected in Search By. Set the end time for the archive.	[Current time]
Archive	Select to save the selected range of video to a file on the PC.	

In the Archive tab, the Record video stream is selected to provide the best quality video for the archive segment.

To Archive Video Segments

1. In the Select drop down menu, select the Record video stream.

The Explorer MX-HD DVR records two streams of video, one for low bandwidth remote viewing, and one with higher video speed, quality, and resolution settings for creating archives. When accessing the DVR with vMax Web, the Record 2 video stream is selected for use with low bandwidth connections while viewing live video.

Higher video speed, quality, and resolution settings will provide clearer pictures and will require more storage space and longer archiving time. These settings are adjustable in the Configuration tab's Record menu.

2. Select the check box(es) for the camera(s) to archive.
3. In the Archive Range area, select the archive start and end dates and times.
4. Click Archive.
5. In the Save As window, choose a file saving location and enter a file name.
vMax Web saves archives in the Seon DVR format, preserving all video and telemetry data, which for security purposes can only be viewed with Seon Design's vMax View application.
6. Click Save.
The progress bar appears while the archive is being created.
7. In the confirmation dialog, click OK when the archive is complete.
The archive is ready to be viewed with the vMax View archive viewer.
8. To view the archive you require vMax View software from Seon Design.

3.3.4.1. Archive Segmentation

Archives larger than 2GB are segmented when downloaded from the MX-HD DVR. The segments are saved as separate archive files with the following naming convention:

- Archive.avr (original)
- Archive-002.avr (next segment)
- Archive-003.avr (next segment)

If your archive seems too short it could have been segmented.

vMax View has an option to stitch together segmented archive video if required.

3.3.5. Viewing MX-HD Video Archives

View the archive using the vMax View software application. When the application is installed, double click the archive file to open it in vMax View. See the *vMax View User Guide, 700-0137*. for detailed procedures.

CHAPTER 4

DVR Firmware and Configuration Uploads

This chapter provides information and procedures for uploading firmware updates and DVR configuration files to the DVR.

**CAUTION: Administrator Permissions Required**

These procedures should only be performed by administrator level staff.
If you have questions about these procedures, contact Seon support.

This chapter contains the following sections:

[Firmware Updates, on page 4-2](#)

[Configuration Uploads, on page 4-3](#)

[USB Memory Device to DVR Configuration Upload, on page 4-3](#)

[Uploading Configuration Files to DVR via vMax Web, on page 4-7](#)

For complete configuration settings and menu options, see the *Explorer® MX-HD Installation and Configuration Guide*, 700-0157.

4.1. Firmware Updates

The firmware version is displayed on the top right corner of every menu. The firmware update must be obtained from Seon Design. To install a firmware update, a USB memory device must be formatted from a Windows®-based computer using the FAT file format. Load the Program Update file onto the USB memory device.

	CAUTION: Equipment damage Do not remove power while updating the DVR firmware. Equipment damage may result.
---	--

To install a firmware update on the MX-HD:

1. Power up the DVR using the vehicle ignition.
2. Insert the USB memory device with the new firmware version into a USB port on the DVR.
3. After the DVR has started, go to the System Settings menu > Program Update.
4. Click Update.

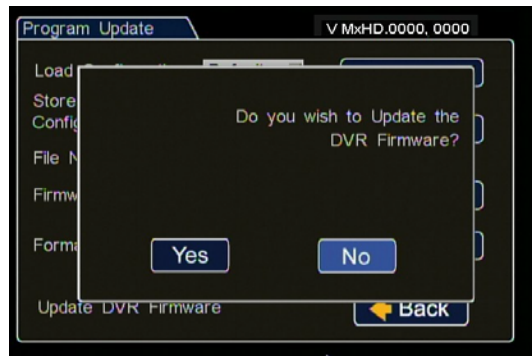


Figure 4-1 Updating DVR Firmware Dialog Box

A window appears asking if you wish to update the DVR firmware.

5. Click Yes to proceed, or No to cancel.
6. Once the update is finished, the DVR will automatically restart.

Important: On restarting, the DVR will take up to 3 minutes to load as it completes the upgrade process. Wait until the DVR finishes loading.

7. Remove the USB memory device.

4.2. Configuration Uploads

A configuration file is uploaded to a DVR when the DVR is first installed or when settings need to be changed on multiple DVRs in a fleet.

Configuration files can be uploaded at the DVR with a USB drive or over the network using vMax Web or vMax Commander applications. Use these procedures upload DVR configuration files.

To upload configurations with vMax Commander, see the the vMax Commander Installation and Configuration Guide (700-0100).

4.2.1. USB Memory Device to DVR Configuration Upload

This method requires physical access to the DVR and a portable video monitor and trackball USB mouse.

To load a configuration update to the DVR, the USB memory device must be formatted by a Windows®-based computer using the FAT32 file format.

To upload a configuration update on the MX-HD via USB:

1. Load the configuration file onto the USB memory device.
2. Copy the configuration file at the root of the USB memory device folder.

Important: For USB uploading, the configuration file name can have no more than four characters. Example: MXHD.seon.

3. Power up the DVR using the vehicle ignition.
4. With the DVR on, connect the portable video monitor and USB mouse.
5. Insert the USB memory device with the new configuration file into the USB port on the DVR.
6. In the DVR on screen display, double right click to open the menu, click Configuration, and then click Network.



Figure 4-2 Main Menu and System Menu

7. In the System Settings menu click Program Update.



Figure 4-3 System Program Update Menu

8. From the Load Configuration menu, select the file to upload.



Figure 4-4 Select Configuration File

Important: The Load Configuration menu displays only the ten most recent configuration files on the USB drive.

- From Include Network, select whether or not to overwrite the existing DVR network settings with the new configuration settings. The default setting of NO keeps your existing network settings.



CAUTION: DVR Communication Disruption Risk

Avoid unintentionally changing the DVR network settings when uploading a new configuration. When saving or changing network settings, communication with the DVR can be disrupted.



Figure 4-5 Program Update Menu

- Click Load.



Figure 4-6 Program Update Menu

A window appears asking if you wish to update the DVR configuration.

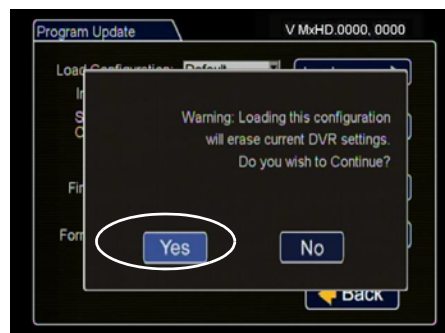


Figure 4-7 Load Configuration: Warning Message

- Click Yes to continue or No to cancel.

12. Click Back in the Program Update and then System Settings menus to save and exit the menus.



Figure 4-8 Click Back to Save Configuration

13. From the Configuration menu, click Title/Display, and in the Titles and Display menu, update the text in the Main_Title field.



Figure 4-9 Titles and Display Menus

14. Click Back to save.
15. Remove the USB memory device.
16. Turn off the DVR, restart the DVR, and confirm that the new configuration settings have been applied.

4.2.2. Uploading Configuration Files to DVR via vMax Web

To remotely install a configuration update, the configuration file (received from Seon or created and saved from a DVR in your network) must be on a computer with network access to the DVR and with Internet Explorer 8 (32 bit version) to access vMax Web.

To upload a configuration update on the MX-HD via vMax Web:

1. On a computer, copy the DVR configuration file.
2. Power up the DVR using the vehicle ignition.
3. Open Internet Explorer, and in the address bar, type in the DVR IP address.
The default IP address is http://169.254.1.1.
4. The vMax Web login screen appears.



Figure 4-10 Login vMax Web

5. At the login prompt, enter a user name and password to access the internet browser user interface.

User names and passwords are case sensitive.

- Default User name: Admin.
- Default Password: 11111111.

CAUTION: DVR Password Security

The default password is 11111111. For security purposes, Seon recommends that the user default login and system settings passwords should be changed. Seon is not responsible if the password is lost or forgotten.

6. Click OK or press Enter on the keyboard to display the vMax Web interface live view screen.



Figure 4-11 vMax Web Live View

7. Select the Configuration Tab.
8. On the Configuration tab, click the System icon.

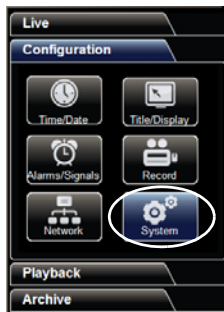



Figure 4-12 vMax Web System Settings

9. In the Program Update Settings area, select the Include Network Settings check box to overwrite the existing DVR network settings with the new configuration settings. The default (cleared) setting keeps your existing network settings during the configuration upload.

	<p>CAUTION: Risk of Network Settings Loss</p> <p>Configurations uploaded to the DVR with vMax Web do not get written to the DVR until it powers down and restarts.</p> <p>If anyone edits the DVR settings locally after this configuration is uploaded but before the DVR is restarted, the settings uploaded from vMax Web will be lost.</p>
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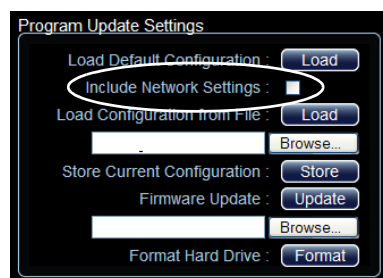


Figure 4-13 vMax Web System Configuration Program Update Settings

10. In the Program Update Settings area, below the Load Configuration from File field, select Browse to open the computer search window.

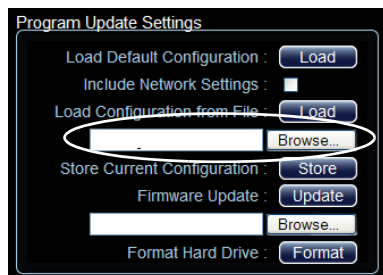


Figure 4-14 vMax Web Program Update Settings

11. In the computer file search window, navigate to the configuration file and click Open.

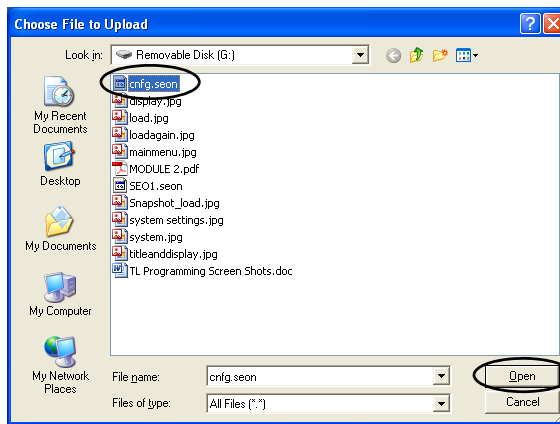


Figure 4-15 Windows File Search

Important: For consistency, Seon recommends that the configuration upload file name should be kept to four characters maximum (****.seon) in the event that the file needs to be loaded to the DVR from the USB port. The DVR USB upload interface supports only four characters in the file name.

12. The configuration file name and location appear in the location field.

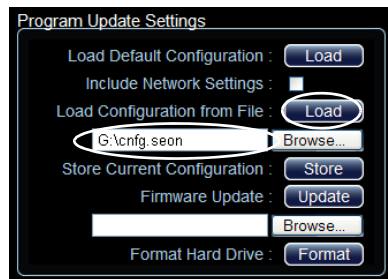


Figure 4-16 vMax Web Load Configuration from File

13. Beside the Load Configuration from File field, click Load.
14. In the Message from Webpage, click OK to proceed or Cancel to return to the previous menu.

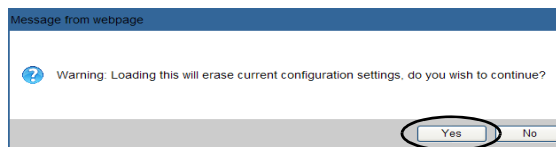


Figure 4-17 Loading Confirmation

15. If necessary, agree to Windows Run Add-On requests.

16. When the progress bar shows the update is 100% complete, click OK.



Figure 4-18 Loading Complete

17. In the Titles/Display menu, update the text in the Main_Title field.

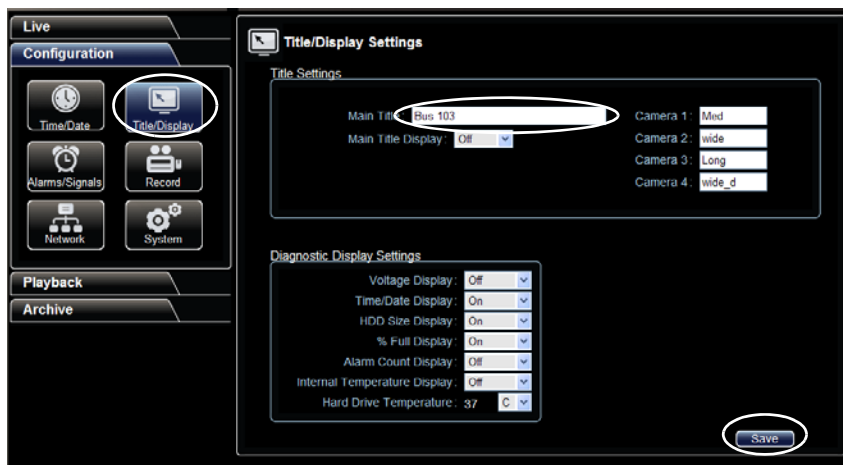


Figure 4-19 Titles and Display Menu

- 18. Click Save to save the settings to the DVR.
- 19. Power down and restart the DVR.
- 20. Login with vMax Web and refresh the vMax Web browser view.
- 21. Confirm that the new configuration settings are in place.
- 22. If the DVR's IP address has changed as part of the configuration upload, check and set the network computer's DVR detection settings accordingly.

CHAPTER 5

Maintenance and Troubleshooting

Table 5-1 Maintenance Tasks

Tasks	What to do
Synchronizing the DVR Clock	If the system does not have a GPS sensor, synchronize the DVR clock every six months to ensure accurate video recording of the time and date. For setting the time and date, see the Time and date menu.
Cleaning the front cover, cable cover, DVR	The MX-HD DVR's front cover and cable covers are made from 18 gauge steel, coated with an outdoor powder paint, and only require periodic cleaning. To clean, use a damp cloth with a mild detergent. Do not allow water into the holes.
Cleaning the camera and window	Refer to the product documentation for cleaning the camera.
Replacing the fan filter	Check the fan filter for excess dirt on a regular basis, and replace the filter when it restricts airflow. Failure to replace a blocked filter may result in the DVR shutting down on a hot day due to inadequate air circulation. Contact your dealer or Seon Design to obtain a replacement. <ol style="list-style-type: none"> 1. Remove the filter cover by gently prying it off with a small flat screwdriver. 2. Discard the used filter and place a new filter back into the filter holder. 3. Push the filter cover back into the holder and snap it into place.

**CAUTION: Equipment damage**

Do not remove the four screws holding the fan in place. Loose components inside the unit could cause internal damage.

5.1. Returning Product for Service

If any part of the MX-HD is to be returned to Seon Design Inc. for service, contact Seon, provide the model and/or serial number of your unit, and ask for a Return Authorization (RA) number which allows the service technicians to track your product when it comes in for service. Please have the RA number clearly marked on the outside of the shipping box. **ANY PRODUCT SENT TO SEON DESIGN INC. WITHOUT AN RA NUMBER MAY BE REFUSED.**

The contact numbers for Seon Design Inc. are:

- Toll Free Telephone 1.877.630.7366
- Direct Telephone 604.941.0880

Please refer to the “Seon Design Inc. Product Warranty” on page W-1 to review the terms of warranty service, contact, and shipping information, as well as other important issues regarding the service and operation of your system.

5.2. Troubleshooting the MX-HD

The MX-HD is designed for high reliability of operation. If you have any problems with your system, however, read this chapter. If you cannot resolve the issue, contact Customer Service at Seon Design.

Symptom	Possible Cause and Solution
All problems.	<p>Many system problems are caused by issues with the power supplied to the DVR. Check the following:</p> <ul style="list-style-type: none"> The voltage to the system may be too low. Check the voltage display (On or Off) Diagnostic Display. If the voltage display is turned OFF, go to the Diagnostic Display menu and turn Voltage Display to ON. The voltage range should be between 8 to 32 VDC. The power harness from the DVR must be connected as close to the battery as possible. Check the wiring to the battery. Check the in-line fuses and fuse holders. If a fuse is blown, determine the cause before replacing it.
The DVR does not power on.	<ul style="list-style-type: none"> Is the internal temperature below 40°F (4°C)? The TEMP LED on the front panel will be flashing. Is the constant and switched power harness plugged into the DVR securely?
The DVR turns on but does not start recording.	<ul style="list-style-type: none"> Check the ignition wiring from the power input harness. Is the yellow wire connected to an ignition switched circuit? Is the hard drive installed properly with the key in the locked position on the front panel? Is the temperature below 40°F (4°C)? Check the temperature display on the main menu. See the Diagnostic Display menu. Wait for the DVR to warm up and start recording. Is the temperature above 122°F (50°C)? Check the temperature display on the main menu. Check the battery voltage. Check the settings for Record Delay-On time in the Record menu. See the Record menu settings. Are the timers on? See the Timers menu settings.
There is no picture on the video monitor output.	<ul style="list-style-type: none"> Check the connections inside the camera, as well as the connections inside the DVR cable cover. The voltage to the system may be too low, less than 8 VDC. If the status LED on the front panel is flashing slow, the DVR is in low voltage.
The live camera picture is snowy, fuzzy, or grainy.	<ul style="list-style-type: none"> Check all connections inside the camera. Is the camera cable damaged? Check the connections inside the DVR lock box. Is the DVR power harness connected directly to the bus battery?
The playback picture is snowy, fuzzy, or grainy.	<ul style="list-style-type: none"> Is the power input harness connected to the battery? Check the video monitor cable attached to the front or back of the DVR.
VLoss event indicated when all cameras display	<p>When A DVR is installed with less than the full complement of cameras connected, unused camera input settings must be disabled to prevent the DVR from generating Video Loss (VLoss) events for those camera inputs.</p> <p>In the DVR Configuration menus, disable unused camera inputs as follows:</p> <ul style="list-style-type: none"> Record Settings menu: Camera Speed OFF, Camera Audio OFF (to save disk space) Record 2 Settings menu (DX and MX series DVRs only): Camera Speed OFF Alarms/Signals menu: Channel Speed OFF
HD Camera menu shows red square and says Not Connected.	<ol style="list-style-type: none"> In the CHW camera, press the Default button for 8 seconds. In the MX-HD OSD, go to Recording Settings > HD Camera > Advanced Settings and press the HD Cam Defaults button. Wait 1 minute for the camera to reboot. In the Advanced Settings menu, press the Test Connection button. to see if the green square appears and the Connected message appears. If the red square still displays call Seon Technical Support.

APPENDIX A

Specifications

This appendix provides the product specifications for the Explorer MX-HD Basic and Plus Mobile Digital Video Recording (DVR) System.

Note: Specifications are subject to change without notice.

A.1. Explorer MX-HD

Video Input/Output	75 Ohm NTSC video
Video Resolution	High Definition: 1280 x 720 pixels Analog: 720 x 480, 720 x 240, or 360 x 240 pixels
Video Compression	H.264, MPEG-4, MJPEG
Media Storage	DVR hard drive, or Solid State hard drive
DVR Hard Drive Removal	Hot swappable, locking key-secured
Camera Input Connectors	6-pin Molex
Audio Input Level	-8 dBm
Audio Output Level	-6 dBm, 10 kOhm
Operating Temperature	-22°F to 122° F (-30°C to 50°C)
Storage Temperature	-40°F to 158°F (-40°C to 70°C)
Operating Humidity	0 to 95% relative humidity, non-condensing
Operating Voltage	8 to 32 VDC
Transient Protection	600 W per signal input
Temperature Protection	Advanced Smart-Temp
Power Harness Connector	4-pin Molex
Alarm Input Connector	2-pin Molex
DVR Hard Drive Dimensions (H x W x D)	0.83 x 3 x 5.1" (21 x 76 x 130 mm)
DVR Dimensions (H x W x D)	2 x 7 x 6.5" (51 x 178 x 165 mm)
DVR Weight	5.3 lb (2.4 kg) with front cover, cable cover
Fuses: Power Circuit and Ignition Circuit	5 A and 1 A
Ethernet	Gigabit

A.1.1. Advanced Smart-Temp™

Temperature inside DVR	Advanced Smart-Temp...
Below -4°F (-20°C)	DVR is not powered, although the hard drive can still be removed from the DVR, the heater is on. If the temperature falls below a preset value with the heater on, the DVR shuts down.
Above 149°F (65°C)	Shuts down the DVR to protect the hard drive from damage.

A.1.2. Explorer MX-HD Functional Features

Time Format	12-hour or 24-hour format
Date Format	mm-dd-yyyy, dd-mm-yyyy and yyyy-mm-dd
Camera Title	8 characters
Repeat Record	User selectable On/Off
Record Delay-On and Record Delay-Off	0 seconds to 60 minutes
Power Delay-Off	0 minutes to 4 hours
Daily Timers	10
Alarm	ALM1 is available for MX-HD Basic. ALM1 to ALM4 are available for MX-HD Plus with the Smart-Link™ module.
Playback Search	Date and Time, Ignition, Alarms, or All Events
Playback Speed	Image-by-Image, 1×, 2×, 4×, 8×, 16×, 32×, step
USB Memory Device	SanDisk Cruzer® Mini or equivalent

A.1.3. Explorer MX-HD Front Cover, Cable Cover

Main Enclosure	18 GA cold rolled steel (CRS), powder coated black paint
Door Lock	Industrial cam lock, keyed alike.
Dimensions (H × W × D)	2 5/16 × 8 3/16 × 10 1/8" (59 × 208 × 257 mm).

A.1.4. Smart-Link™ Module

Power Harness Connector	4-pin Molex
Auxiliary Power Output Connector	2-pin Molex
GPS Input Connector	4-pin Molex
Signals Connector	6-pin Molex
CAN bus Network Connector	4-pin Molex
Serial Port/GPS	9-pin DB9
Alarm Input Connector	8-pin Molex
Indicator Panel Connector	5-pin Molex
Speed Input Connector	3-pin Molex
Dimensions (H × W × D)	5.875 × 3.25 × 0.875" (150 × 83 × 23 mm)
Weight and material	9 oz (255 g), steel, powder coated black pain

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Seon Design® Inc.

Seon Design Inc. is a specialist in the design and manufacture of video surveillance systems for mobile applications. Seon has been the preferred solutions provider for the pupil transportation industry since 1999. Today, we are proud that our success in this area has made us the leading manufacturer of mobile video surveillance systems in North America.

Contact Information


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Printed in Canada

Seon Design Inc. Product Warranty

Seon Design Inc. (Seon) warrants the cameras and components listed below against defects in workmanship and materials provided that such defects appear or are discovered within the respective periods specified below and provided further that the purchaser of such products notifies Seon of such defects within thirty (30) days of the appearance or discovery of such defects:

- Three (3) years from date of purchase, parts and labor on all Cameras
- Three (3) years from date of purchase, parts and labor on the Explorer® Premier, DX, TX, EX, MX, and Trooper® TL series mobile DVR Systems
- One (1) year from date of purchase, parts and labor on the Smart Reach® Wireless systems and other Wireless products
- One (1) year from date of purchase, parts and labor on the VML Controller and other vMax Live Plus hardware products
- One (1) year from date of purchase, parts and labor on all other products and accessories

All service/replacement parts and repairs are warranted for a period of 90 days.

Subject to the terms and conditions listed below, during the relevant warranty period, Seon will repair, replace, or refund the purchase price for the defective product, whichever Seon considers to be appropriate in the circumstances, in Seon's sole and arbitrary opinion, free of charge, any defective products returned prepaid. In the event purchaser has a problem with any Seon product, please call and request a **RETURN AUTHORIZATION (RA) NUMBER** from the Service Department. Please call 877-630-7366 or (604) 941-0880 and ask for the Service Department. Be sure to have the model number, serial number and the nature of the problem available for the customer service representative. Prior authorization **MUST** be obtained for all returns, exchanges, or credits. **ITEMS SHIPPED TO SEON WITHOUT A CLEARLY IDENTIFIED RA NUMBER MAY BE REFUSED.**

Products returned will be tested to verify the defect. Upon verification of the defect, the product will be repaired or exchanged, or the purchase price will be refunded or credited to the customer's account, at the sole option of Seon. In the event of replacement, the returned product will be credited to the customer's account and a new invoice issued for the replacement item. Seon reserves the right to refund the purchase price or to issue a credit only in lieu of replacement. Seon may use new or refurbished replacement parts for repairing its products, at its sole and arbitrary discretion. Seon may replace an entire unit with an equivalent model, at its sole and arbitrary discretion. If a unit is exchanged, the returned product shall become the property of Seon and the exchange product becomes the property of the purchaser, and the remainder of the warranty that applied to the original unit purchased shall apply to the exchanged product. Exchange units may be new units or units that have been repaired to full factory specifications at Seon's discretion. If the product is found to be in good working order or its inability to function properly is not covered by this warranty, the product will be returned in the same condition as received unless repair is possible and requested by the customer. Repairs of such nature will incur a charge for parts and labor and will proceed only by agreement with the customer to accept the charge.

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For those customers whose mailing address is in Canada, Seon's offer and any agreement of sale resulting therefrom shall be governed by and construed in accordance with the internal and domestic laws of the Province of BRITISH COLUMBIA and the laws of Canada applicable therein without giving effect to the conflict of laws rules thereof. The courts of British Columbia (the "Canadian Closed Courts") shall have exclusive jurisdiction to entertain and determine all disputes and claims, whether for specific performance, injunction, declaration or otherwise arising out of or in any way connected with the construction, breach, or alleged, threatened or anticipated breach of the contract resulting from this offer and shall have jurisdiction to hear and determine all questions as to the validity, existence or enforceability thereof. The purchaser attorns to the exclusive jurisdictions of the jurisdiction of the Canadian Closed Courts, waives any obligation to venue in any action or proceeding regarding Seon Products and waives any objection that the Canadian Closed Courts are an inconvenient forum or do not have jurisdiction over the purchaser of Seon. The United Nations Convention On Contracts For The International Sale Of Goods shall not apply.

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