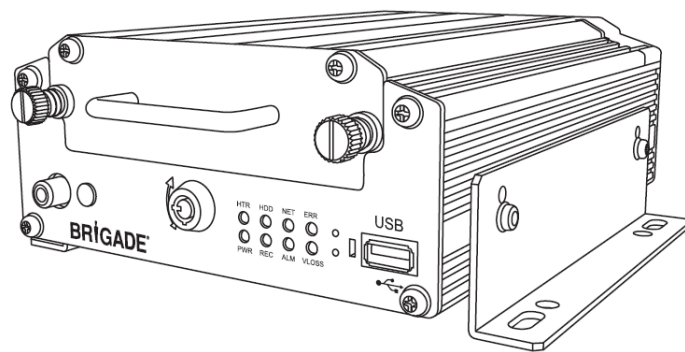


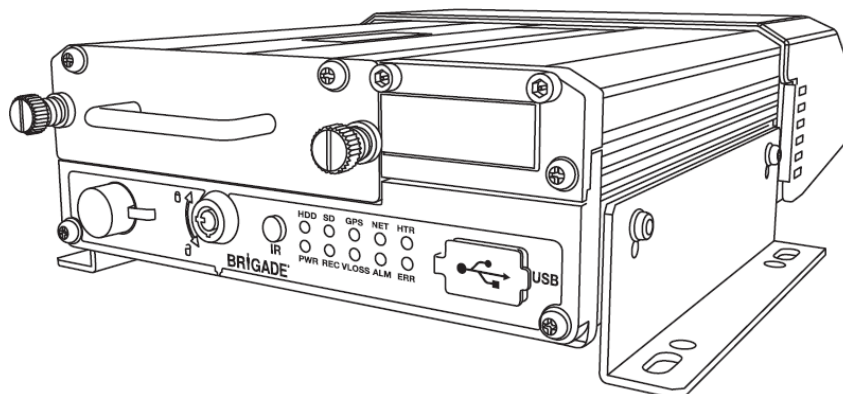


Mobile Digital Recorder

MDR-404GW-500
MDR-404G-500
MDR-404W-500
MDR-404-500



MDR-408GW-1000
MDR-408G-1000
MDR-408W-1000
MDR-408-1000



Installation and Operation Guide

Please refer to <http://brigade-electronics.com/> for most up-to-date data on all products

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1 Introduction to MDR 400 Series Technology

Brigade's MDR-408xx-1000 and MDR-404xx-500 are advanced Mobile Digital Recorders (MDRs) designed to record and playback 8 or 4 channels. The system uses PAL or NTSC cameras in CIF, HD1 or D1 format. Information related to recording parameters, alarms and trigger status can be recorded along with speed, location and G-force data. In addition, data related to the unit itself such as voltage and temperature are recorded and plotted graphically in MDR Software (MDR-Dashboard 2.0 and MDR-Player 2.0).

Recordings can be searched, viewed and exported using the MDR-Dashboard 2.0 program. This allows users to access all of the vehicle's travel information, including route tracking. Recordings can be easily exported in three different ways: as a simple audio/video AVI file playable by consumer media players; as native proprietary format clips or as a password protected .exe file with MDR-Player 2.0 embedded.

The main storage unit is a large capacity Hard Disk Drive (HDD). The secondary storage is an internal SD (Secure Digital) card for mirror (simultaneous) recording. The SD card stores video data in lower image resolution and frame rate (without metadata – blackbox data). This is useful when there is a limitation of the primary storage media (e.g. a HDD write error during a collision).

3G and Wi-Fi settings found in this manual relate to wireless products as described below. These features can be attained by upgrading the MDR 400 Series units. 8 channel models allow users to do a modular upgrade of their units. These units can be upgraded by purchasing various expansion modules. 4 channel units do not have a modular design.

It is imperative that the Brigade MDR is fitted and commissioned by competent and trained technicians. The installers are responsible for the correct setup of the overall system and must adhere to relevant regulations and legislation.

A brief description of each model is shown below:

- MDR-404GW-500 - MDR 400 Series 4CH Mobile Digital Recorder with 500GB HDD, GPS, 3G, Wi-Fi and 32GB SD Card
- MDR-408GW-1000 - MDR 400 Series 8CH Mobile Digital Recorder with 1000GB HDD, GPS, 3G, Wi-Fi and 64GB SD Card
- MDR404W-500 - MDR 400 Series 4CH Mobile Digital Recorder with 500GB HDD, GPS, Wi-Fi and 32GB SD Card
- MDR-408W-1000 - MDR 400 Series 8CH Mobile Digital Recorder with 1000GB HDD, GPS, Wi-Fi and 64GB SD Card
- MDR-404G-500 - MDR 400 Series 4CH Mobile Digital Recorder with 500GB HDD, GPS, 3G and 32GB SD Card
- MDR-408G-1000 - MDR 400 Series 8CH Mobile Digital Recorder with 1000GB HDD, GPS, 3G and 64GB SD Card
- MDR-404-500 - MDR 400 Series 4CH Mobile Digital Recorder with 500GB HDD, GPS and 32GB SD Card
- MDR-408-1000 - MDR 400 Series 8CH Mobile Digital Recorder with 1000GB HDD, GPS and 64GB SD Card

Warning: Prior to attempting the system setup, please ensure the MDR 400 Series Installation & Operation Guide is thoroughly read and understood. Brigade will not be responsible for any failures due to incorrect installation or operation. Ensure your anti-virus software has exclusions in place to allow the MDR software package to function properly.

1.1 Product Features

1.1.1 Differences between MDR-404xx-500 and MDR-408xx-1000

MDR-404xx-500	MDR-408xx-1000
500GB (1TB max) 2.5" HDD with anti-vibration mounting	1TB (1TB max) 2.5" HDD with anti-vibration mounting
Industrial grade 32GB (128GB max) internal SD card for simultaneous recording	Industrial grade 64GB (128GB max) internal SD card for simultaneous recording
Simultaneous 4 channel recording up to D1 @25fps (PAL) / @30fps (NTSC) each	Simultaneous 8 channel recording up to HD1 @25fps (PAL) / @30fps (NTSC) each or 8 channels at D1 @12fps (PAL) / @15fps (NTSC)
Display split 1/4 channels	Display split 1/4/8 channels
1x EIA/TIA 485 (RS485) for optional External G-Sensor or for Remote Status & Interface Panel	2x EIA/TIA 485 (RS485) for optional External G-Sensor and for Remote Status & Interface Panel
4x Select video connectors typical to camera inputs with audio	8x Select video connectors typical to camera inputs with audio
Weight: 2.2Kg	Weight: 2.75Kg
No built-in G-Sensor	Built-in G-Sensor

1.1.2 Common to MDR-404xx-500 and MDR-408xx-1000

- Internal anti-vibration mount for the HDD
- Embedded super-capacitor for finalisation of recording after unexpected power interruption (up to 10 seconds)
- Ruggedized metal case
- Individual channel configurations for recording resolution, frame rate and quality
- Anti-tampering feature – using digital code
- Recording operation log files for troubleshooting
- GPS for location monitoring and tracking with external antenna
- I/O: 8x trigger input (trigger voltage 9V which can be set to trigger at low/high); 2x trigger output (12V max. 200mA)
- USB-B interface for displaying video recordings on a Windows™ operating system using MDR-Dashboard 2.0
- USB-A interface for downloads, upgrades and configurations onto a USB flash drive (flash memory only, maximum 16GB)
- Pre-alarm recording 1-60 minutes and Post-alarm recording 0-1800 seconds. (0 to 30 minutes)
- Video quality selectable at 8 different levels for recording
- Video/Audio compression H.264/ADPCM
- Normal, Alarm or Timer recording modes
- Alarm recordings configurable for trigger, speed, G-Force, video loss, motion detection, blind detection, panic button and temperature
- Low voltage protection with configurable shut-down delay and minimum restart voltage
- Ethernet 10/100 RJ45 port for configuration and live view
- IR Remote control for configuration and recording/event search
- Shut-down delay configurable from 10min to 24hrs
- 12V Output max 1A load
- 9-36V Power Input
- Operating temperature: -25°C to +60°C
- Operating relative humidity: 10% to 90%

2 Kit Contents

2.1 MDR-404xx-500 and MDR-408xx-1000 Kits

2.1.1 MDR-404xx-500



4-Channel Mobile Digital Recorder Control Unit, GPS, 500GB HDD and 32GB SD Card
MDR-404xx-500-CU



MDR 400 Series Brackets with 4x M4x8 Fixing Screws
MDR-400-BKT



MDR 404 16-pin Trigger Cable Loom
MDR-404-TRIG

2.1.2 MDR-408xx-1000



8-Channel Mobile Digital Recorder Control Unit, GPS 1TB HDD and 64GB SD Card
MDR-408xx-1000-CU



MDR 400 Series Brackets with 5x M4x8 and 1x M4x24 Fixing Screws
MDR-400-BKT



MDR 408 26-pin Trigger and EIA/TIA 485 Cable Loom
MDR-408-TRIG



MDR 408 Video Input Cable Loom
MDR-408-VIC

2.1.3 Common for MDR-404xx-500 and MDR-408xx-1000



MDR 400 Series GPS Antenna
MDR-ANT-GPS-01



MDR 400 Series 3G Antenna
MDR-ANT-3G-01
(Depending on model)



MDR 400 Series Wi-Fi Antenna
MDR-ANT-Wi-Fi-01
(Depending on model)



MDR 400 Series 10 to 4 pin Video Output Cable
MDR-400-VOC



MDR First Generation Remote Control with 2x AAA batteries
MDR-RC-01



MDR 400 Series 9-pin Power Cable
MDR-400-PC



MDR First Generation Security Key
MDR-KEY-01



MDR Installation CD
MDR-xxxxx-CD (PN: Depending on model)

2.2 Optional Accessories

2.2.1 Remote Status & Interface Panel



MDR First Generation Remote Status & Interface Panel
MDR-RP-01-P



MDR First Generation 6m Cable for Remote Status & Interface Panel
MDR-06RPC

2.2.2 External G-Sensor



MDR Second Generation External G-Sensor (Non-IP rated)
MDR-GS-02-G



MDR Second Generation 2m External G-Sensor Cable
MDR-02GSC-02

2.2.3 SD Cards



32GB Industrial Grade SD Card Class 10
SD-32GB-IND



64GB Industrial Grade SD Card Class 10
SD-64GB-IND

2.2.4 Fireproof Box with 32GB SD Card



MDR Second Generation Fireproof Box with 32GB SD Card
MDR-FPB-02

2.2.5 Uninterruptable Power Supply



MDR First Generation Uninterruptable Power Supply
MDR-UPS-01

3 Hardware Installation

Warning

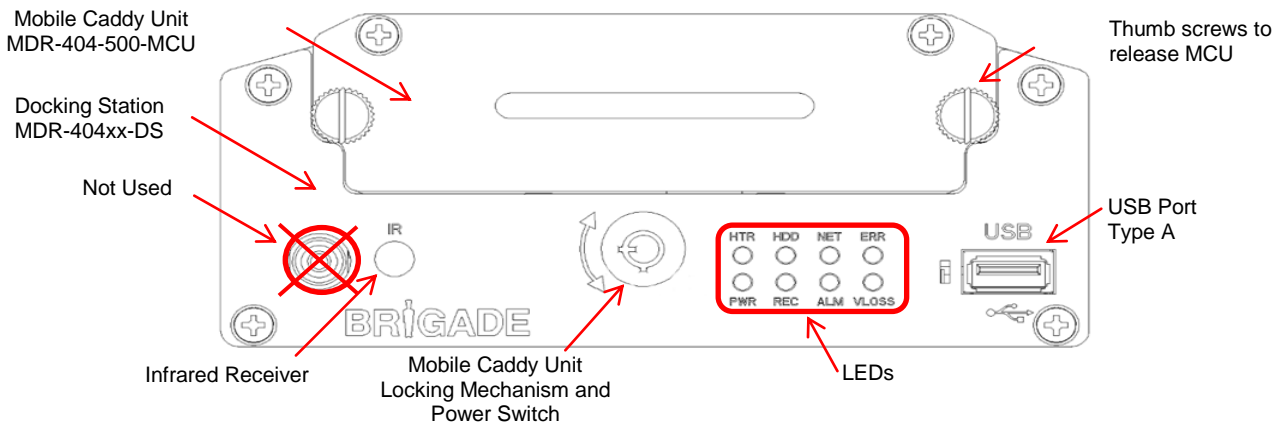
- Connecting any input or output wires to high voltages or ground may damage the product. Brigade will not be responsible for any damage caused due to negligence.
- Connecting audio/video inputs of MDR-404xx-500 and MDR-408xx-1000 to ground or high voltages may damage the product. Brigade will not be responsible for any damage caused due to negligence.

Note:

- The MDR 400 Series Remote Control (MDR-RC-01) may interfere with other devices (e.g. a monitor). Please cover the IR receiver on the monitor when operating the remote control e.g. by using electrical/PVC (black) tape.
- The input trigger threshold for the MDR-404xx-500 is 9V. The input trigger threshold for MDR-408xx-1000 is 3.8V. When connecting any of the MDR-408xx-1000 8x trigger inputs to vehicle signals (e.g. reverse light), ensure the voltage is lower than 3.8V in an off state. If it exceeds the threshold voltage (e.g. due to bulb monitoring), insert an adequate resistor in series. If needed, contact Brigade to discuss these details further.
- The internal anti-vibration mount for the HDD allows for flexible installation. The MDR-408xx-1000 G-sensor needs to be calibrated before use, see 4.2.5 G-Force.

3.1 Front View

3.1.1 MDR-404xx-500 Front View

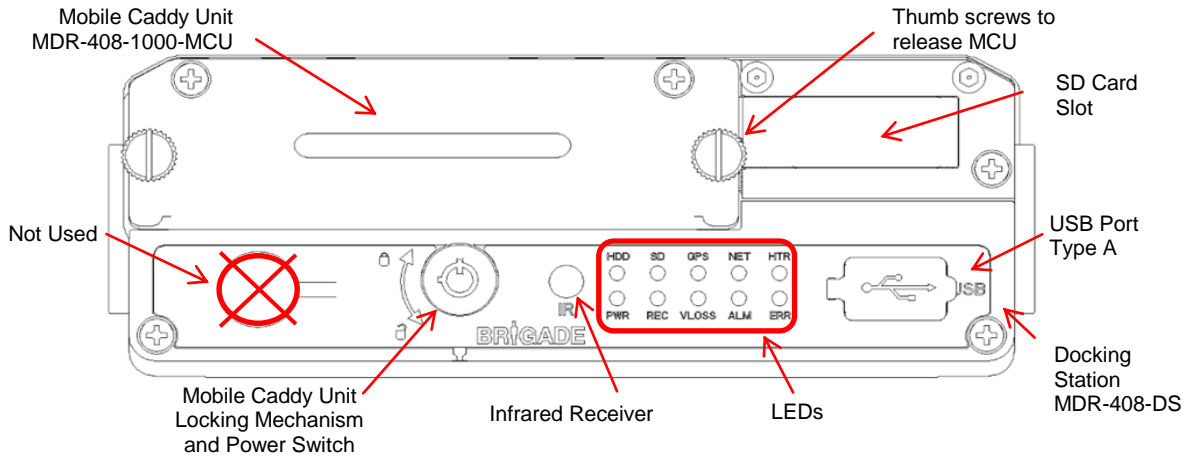


MDR-404xx-500 Front View Figure 1

LEDs:

HTR	Heater Activation	PWR	Power Indicator
HDD	Hard Disk Drive Activity Indicator	REC	Recording Activity Indicator
NET	Network Interface Active (for MDRs equipped with 3G and/or Wi-Fi functions)	ALM	Alarm Activation
ERR	Error LED	VLOSS	Video Loss Indicator of input signal

3.1.2 MDR-408xx-1000 Front View



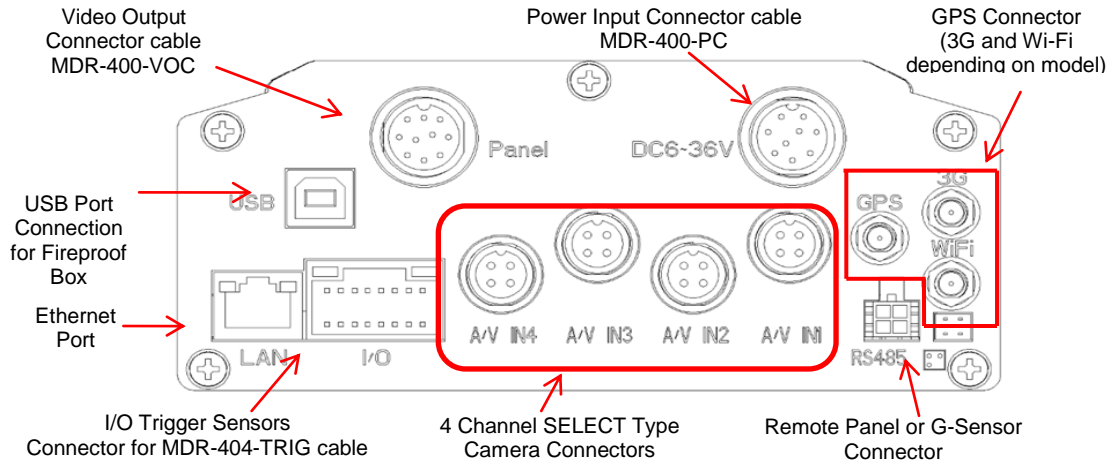
MDR-408xx-1000 Front View Figure 2

LEDs:

HDD	Hard Disk Drive Activity Indicator	PWR	Power Indicator
SD	SD Card Presence Indicator	REC	Recording Activity Indicator
GPS	GPS Module Presence Indicator	VLOSS	Video Loss Indicator of input signal
NET	Network Interface Active (for MDRs equipped with 3G and/or Wi-Fi functions)	ALM	Alarm Activation
HTR	Heater Activation	ERR	Error LED

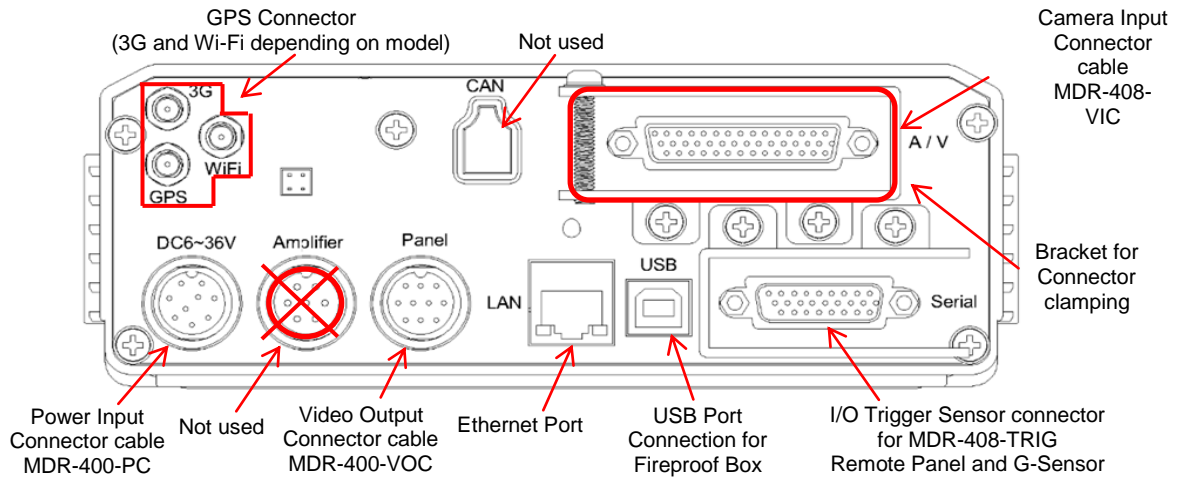
3.2 Rear View

3.2.1 MDR-404xx-500 Rear View



MDR-404xx-500 Rear View Figure 3

3.2.2 MDR-408xx-1000 Rear View



MDR-408xx-1000 Rear View Figure 4

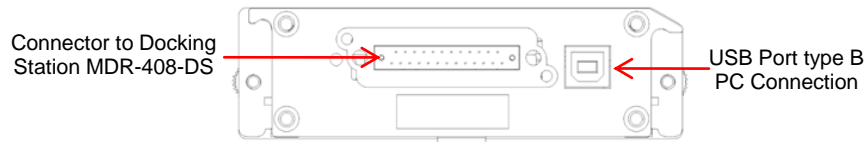
3.3 Mobile Caddy Unit (MCU Contains HDD)

3.3.1 MDR-404xx-500 MCU



MDR-404XX-500-MCU Figure 5

3.3.2 MDR-408xx-1000 MCU



MDR-408XX-1000-MCU Figure 6

3.4 Remote Control

Power – No Function

Note: If security is enabled, password is required. When using Remote Panel, **On** function works **only** from the IR receiver on the front of the MDR main body.

Navigation buttons are used browsing the OSD.

Rewind, Forward, Previous and Next are used for playback.

ENTER – Quick Information

Record/STOP – No Function

F1 function allows users to export all events of the same day to a USB pen drive. See section 4.3.2 for more information.

Login/Lock is used for accessing the OSD. If security is enabled it requires password.

Number Keypad Used for either entering numerical values or to trigger individual camera views.

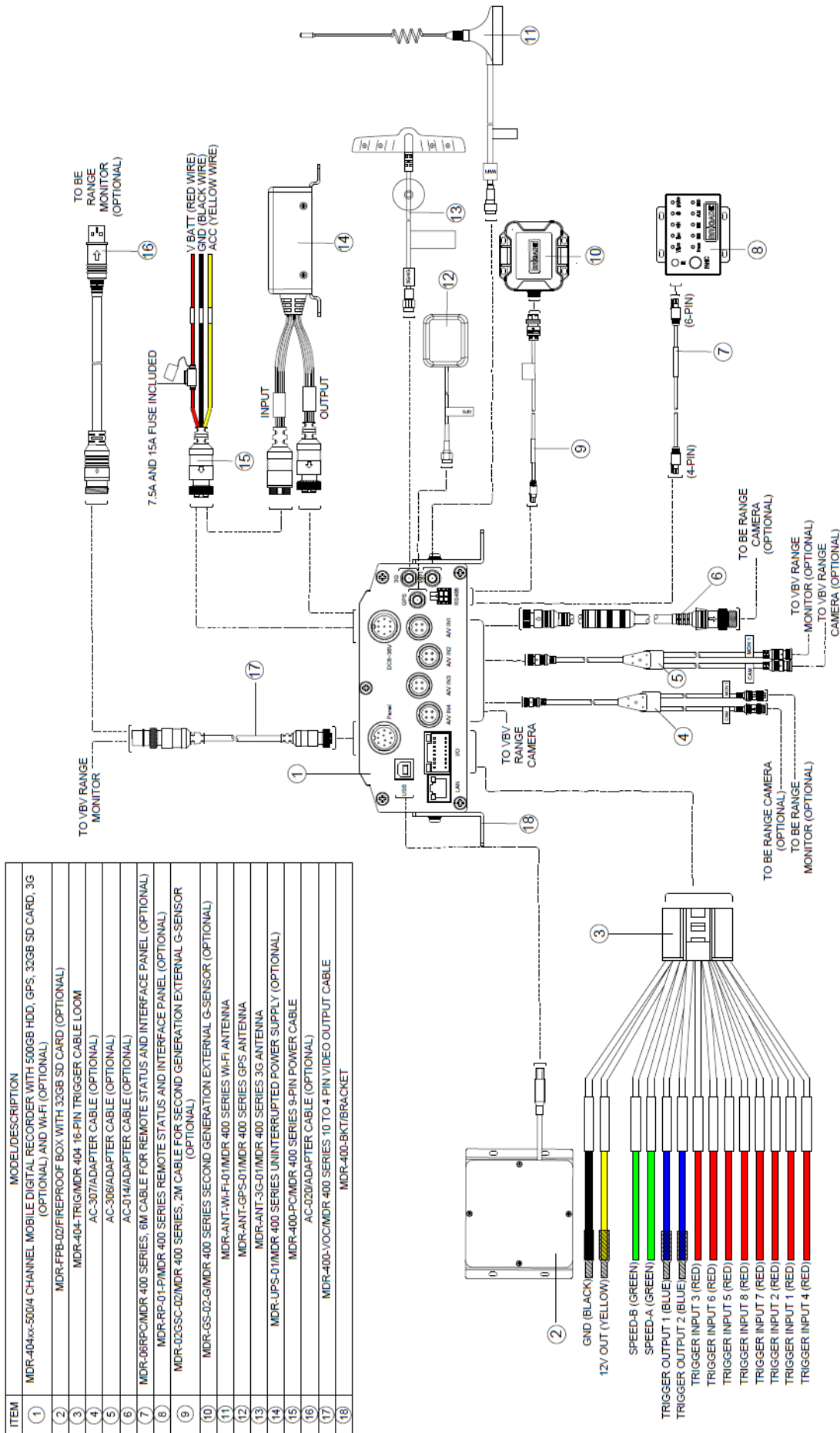
Button **0** is used to either enter numerical value or to trigger split views in the following order: CH. 1-4; CH. 5-8 and CH. 1-8 (MDR-408-1000 only).

Setup is used for accessing the OSD. If security is enabled it requires password.

MDR-RC-01 Figure 7

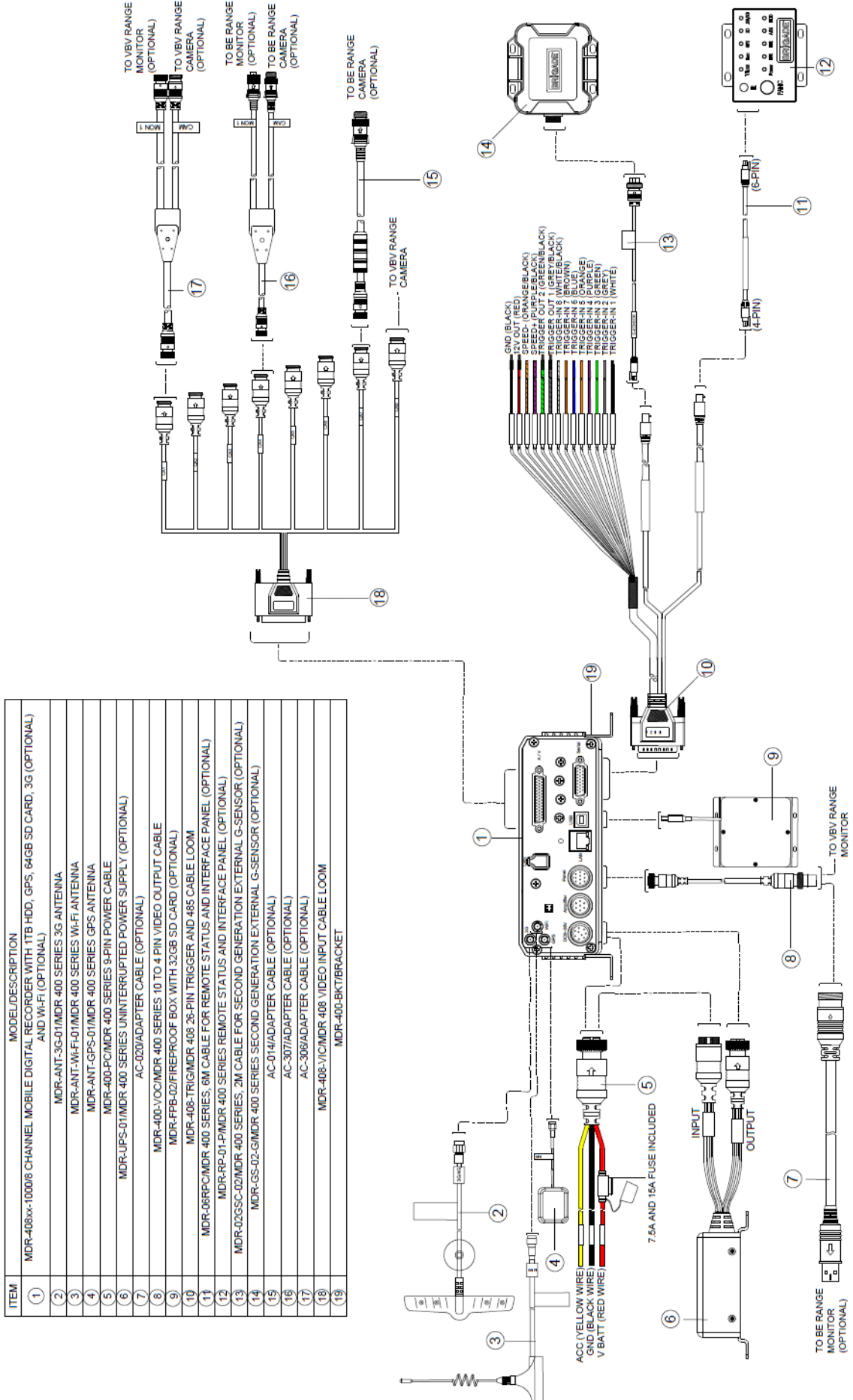
Note: Remote control buttons that are not described in *MDR-RC-01 Figure 7* have no function with the MDR-404xx-500 and MDR-408xx-1000.

3.5 MDR-404xx-500 Connection Diagram



MDR-404xx-500 Connection Diagram Figure 8

3.6 MDR-408xx-1000 Connection Diagram

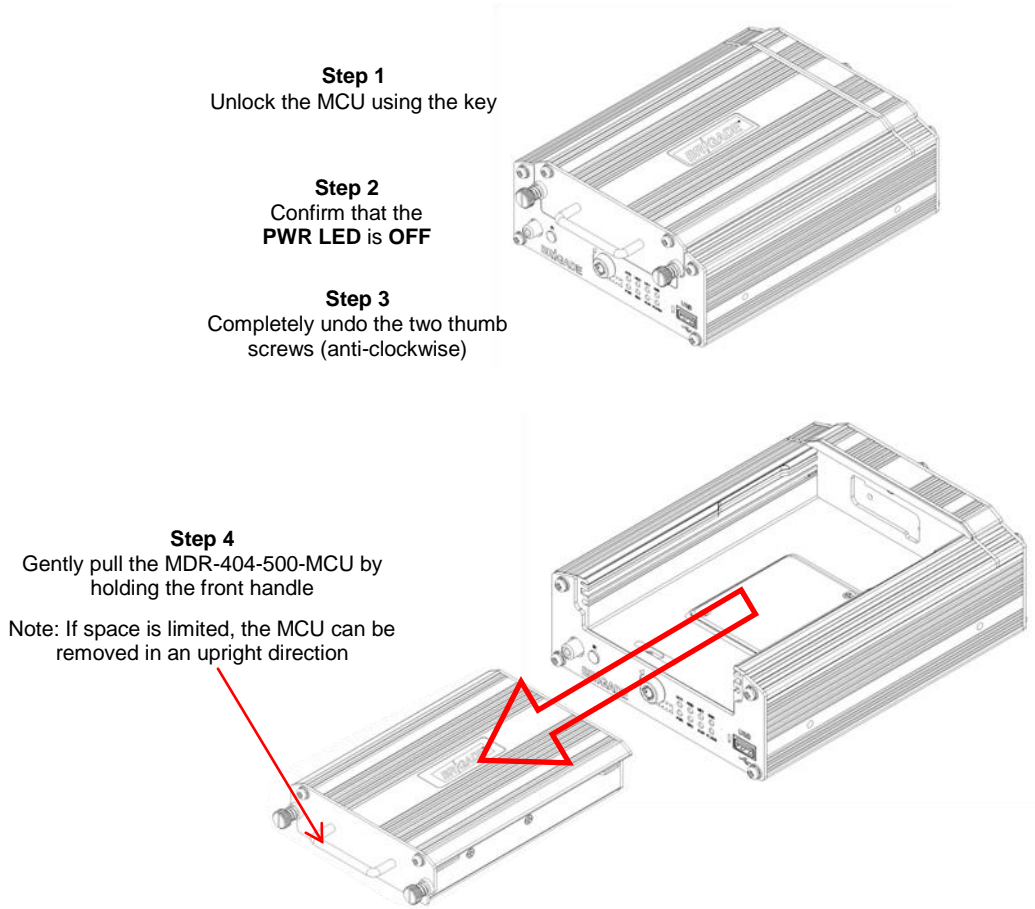


MDR-408xx-1000 Connection Diagram Figure 9

3.7 Mobile Caddy Unit Removal

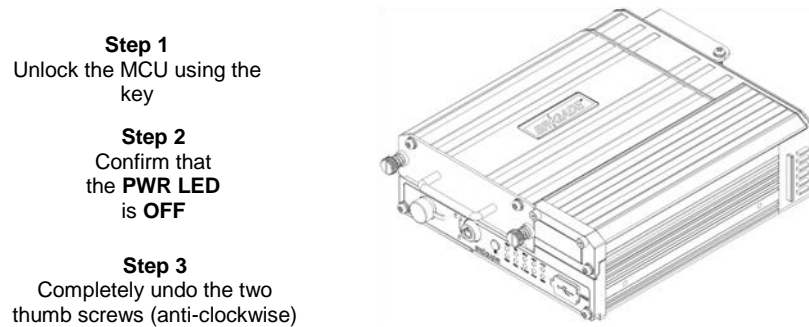
Warning: Follow the removal steps shown below. Failure to do so over a prolonged period of time may damage the HDD. Ensure that the PWR LED indicates the MDR is OFF prior to removal.

3.7.1 MDR-404xx-500 MCU Removal

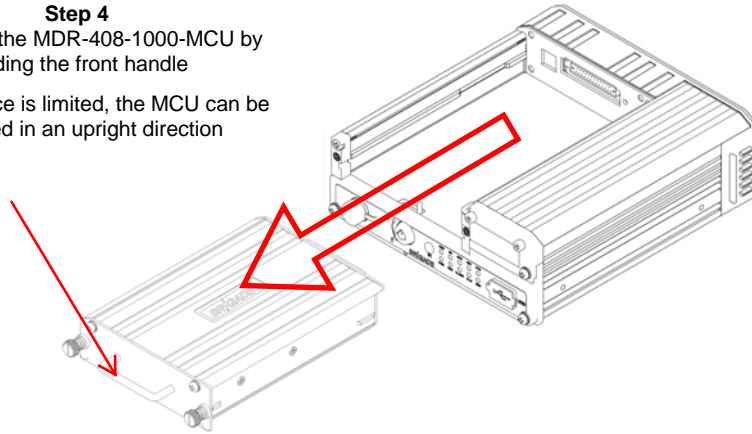


MCU Removal for MDR-404xx-500 Figure 10

3.7.2 MDR-408xx-1000 MCU Removal



Step 4
Gently pull the MDR-408-1000-MCU by holding the front handle
Note: If space is limited, the MCU can be removed in an upright direction



MCU Removal for MDR-408xx-1000 Figure 11

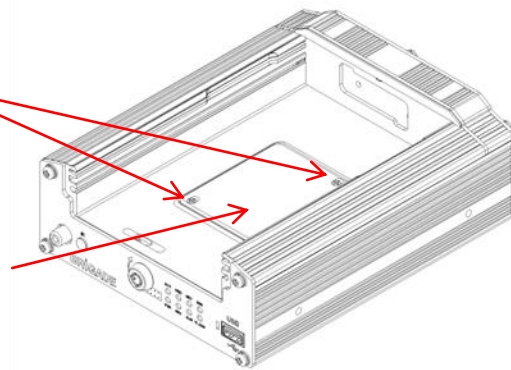
3.8 SD Card Removal

Note: In order to remove an SD card from an MDR, the MCU needs to be removed first (see *SD Card removal for MDR-404xx-500 Figure 12* and *SD Card removal for MDR-408xx-1000 Figure 13*).

3.8.1 MDR-404xx-500 SD Card Removal

Step 1
Completely undo these two screws in order to remove the cover.

Step 2
The SD Card is placed in a SD card slot. Remove and discard the plastic tape covering the SD card. Push and depress the SD card in order to remove the card from its slot.

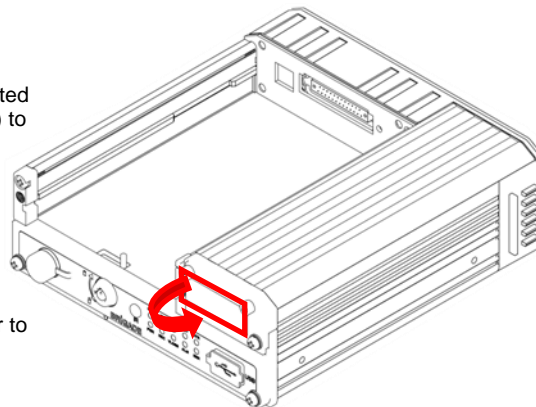


SD Card removal for MDR-404xx-500 Figure 12

3.8.2 MDR-408xx-1000 SD Card Removal

Step 1
Gently open the door marked (as indicated by the arrow on front of MDR-408-EXP) to reveal the SD card slot.

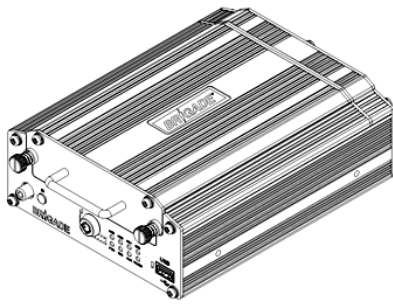
Step 2
Push and depress the SD card in order to remove the card from its slot



SD Card removal for MDR-408xx-1000 Figure 13

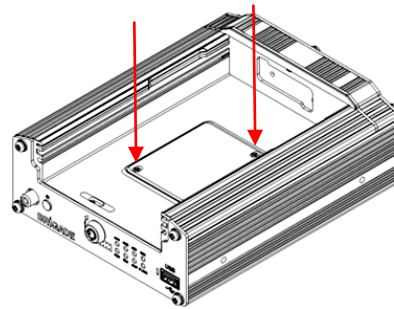
3.9 SIM Card Installation

3.9.1 MDR-404xx-500 SIM card Installation



Step 1

Remove the MDR-404-500-MCU unit. This will allow you to access the SIM card slot.

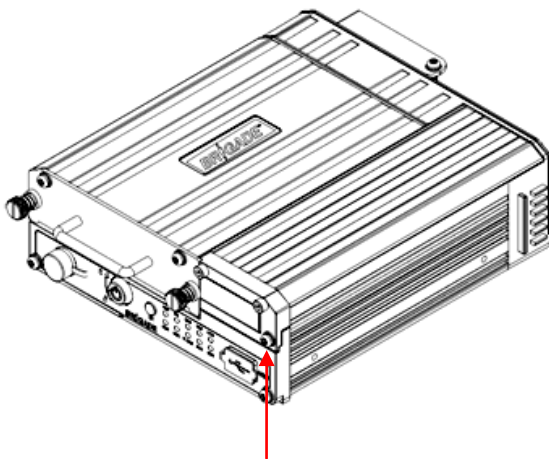


Step 2

Remove the two screws using a Philips screwdriver. Ensure an earthing strap is worn to prevent any damage to the PCB. Remove the film that is placed over the SIM card slot. To unlock the SIM slot, slide and then pick up the lock. Insert the SIM card with the contact pins face down. Lock the SIM securely in place.

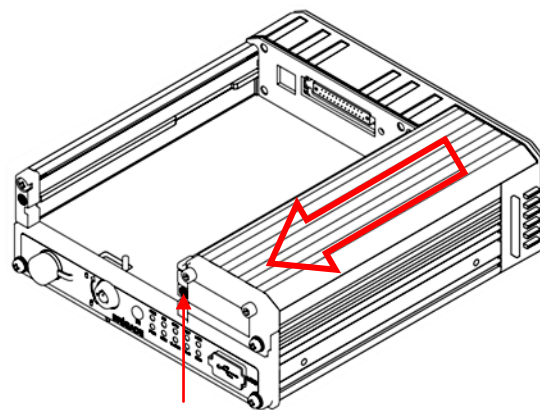
MDR-404xx-500 SIM card Installation Figure 14

3.9.2 MDR-408xx-1000 SIM card Installation/Expansion Module Upgrade



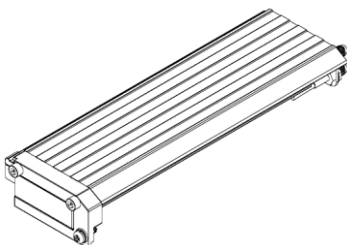
Step 1

Remove the MDR-408-1000-MCU. Undo the screw shown above.



Step 2

Open the SD card door. Undo the screw that is now visible after opening the door. To remove the MDR-408xx-EXP, slide the panel in the direction shown above.



Step 3

Ensure an earthing strap is worn to prevent any damage to the PCB. Remove the film that is placed over the SIM card slot. To unlock the SIM slot, slide and then pick up the lock. Insert the SIM card with the contact pins face down. Lock the SIM securely in place.

This modular design allows for easy upgrading or downgrading of 8 channel MDR units. To upgrade to a 3G/Wi-Fi solution, users need to swop the MDR-408xx-EXP and upgrade their MDR unit's firmware.

MDR-408xx-1000 SIM card Installation Figure 15

3.10 Antennae Installation

The information found in this sub-chapter may be found in the FCS1362:2016 UK CODE OF PRACTICE for the installation of mobile radio and related ancillary equipment in land based vehicles. Please use this document for further details. Please see Appendix Chapter 15 General Antennae Guidelines for more information.

3.10.1 GPS antenna Installation (Included)

The GPS antenna needs to have an unimpeded view to the sky. The antenna positioning and orientation is critical to ensure effective operation. Horizontally mounted on a metal plate is optimum.

3.10.2 Wi-Fi antenna (Depending on Model)

Before a magnetic mount antenna is fitted both the underside of the base and the selected body panel surface should always be cleaned so as to avoid damage to the paint work.

- (a) They must be directly placed on a flat area of steel
- (b) They should not have any other material inserted between the magnetic base and vehicle body other than a protective pad or boot supplied by the antenna base manufacturer. This is to avoid reduction in the magnetic retention strength and any effect on the coupling to the ground plane.

3.10.3 3G antenna (Depending on Model)

On-glass antennas must be:

- (a) securely fitted and fixed away from any metal which could deflect the signal
- (b) located such that driver visibility is not impaired
- (c) avoid heated screen elements
- (d) mounted outside of the swept area of the windscreen

4 MDR OSD Setup

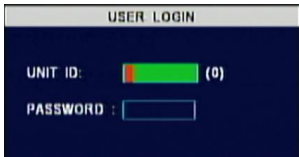
This chapter describes the typical configuration of the MDRs. For additional features and explanations of minor OSD functions, refer to Chapter 7: Additional OSD Features.

- (a) Use **SAVE** which is located at the bottom of each page after making any changes. Leaving a page prior to saving will cause changed settings to be lost.
- (b) The setup menu may be accessed by using the **Setup** button.
- (c) A login screen is displayed which is shown in *MDR Login Screen Figure 16*.
- (d) By default the **UNIT ID** is **0**. The default **PASSWORD** for each user account is: **Administrator: 88888888, Power User: 66666666** and **User: 22222222**.
- (e) Once the login is successful, the OSD menu is displayed. See *Recordings Menu Figure 17*, *Settings Menu Figure 18* and *Information Menu Figure 19*. The menu is navigated using the directional arrows and the enter/exit buttons. See 4.3.4 User Security for further information.

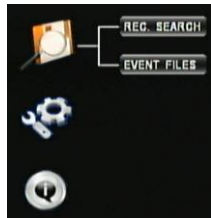
Note: When accessing the menu, recording stops and only resumes when the setup menu is closed.

- (f) Prior to using the MDR please set the MDR to default settings and clear all history information, this is achieved by: **Settings → System → Config → Default** and **Settings → System → Config → Reset**. A complete OSD map is found in chapter 11 On-screen Display Map.

Warning: Using the MDR for prolonged periods of time without ignition (vehicle running) can drain the vehicle's battery.



MDR Login Screen Figure 16



Recordings Menu Figure 17



Settings Menu Figure 18



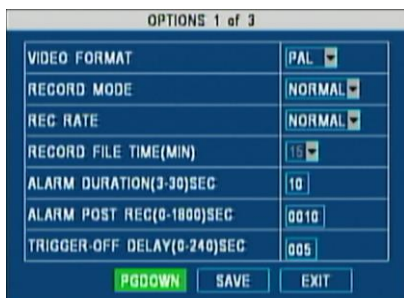
Information Menu Figure 19

4.1 Configuring Standard Recording Settings

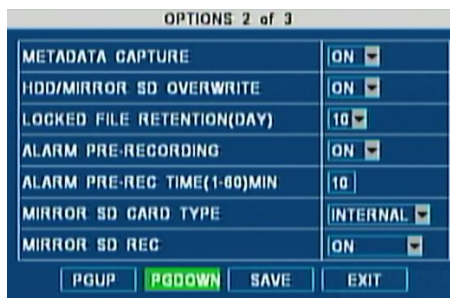
The following section explains how to configure recording parameters. This starts from the selection of main options, the variables to be displayed and the quality of recording for each individual camera.

4.1.1 Options

- (a) By navigating to **Settings → Record → Options** users will be presented with *Options 1 of 3 Figure 20*, *Options 2 of 3 Figure 21* and *Options 3 of 3 Figure 22*.



Options 1 of 3 Figure 20



Options 2 of 3 Figure 21



Options 3 of 3 Figure 22

VIDEO FORMAT: This option allows the selection of either **PAL** or **NTSC** standards. This will be the same for all cameras.

Note: Brigade's monitors have automatic detection of these standards.

RECORD MODE: There are three modes available – all modes require the **IGNITION** signal to be applied, or timer auto-boot to be set up:

- **NORMAL** - allows continuous recording after powering up until the device shuts down (including the “shutdown delay” – see section 4.3.2 Options).

Note: Alarm recording is included in this mode.

- **ALARM** - allows users to record only when an alarm has been triggered. Alarms can be configured to be activated by triggers or other alarms (such as under/over speed, G-Force, Panic Button, etc.)
- **TIMER** - allows users to specify timeframes in which the recording will be activated. Refer to section 7.3 Scheduled Recording in order to program these timeframes.

Note: Refer to section 4.3.2 Options, if **ON/OFF TYPE** has been selected with a start-up option other than **IGNITION**; ensure **Auto Boot Up in Schedule** is selected.

REC. RATE: Users may choose either **Normal** (refer to 4.1.4 Record Settings for further details) or **I-Frame**. **I-Frame** allows the recording of 1 frame per second for all channels to save recording space although there is a loss of smoothness during playback.

RECORD FILE TIME: All recordings are broken in recording segments (**15/30/45/60** minutes). This option allows users to choose the recording segment lengths. When mirror recording is active the only available option is **15** minute segments. See section 4.1.5 Sub-Stream Settings for details on mirror recording.

ALARM DURATION: Specifies different lengths between **3-30 seconds**, which allows for longer/shorter alarm durations. If the alarm duration is set to 30 seconds and a short change in voltage is applied to the trigger sensor, this would be treated as a 30 second alarm. See Alarm pre and post recording options below.

Note: If another alarm of the same type is triggered during an alarm, the recording will then reset and begin from the second alarm onwards.

ALARM POST REC: This specifies the period of recording appended at the end of an alarm. For instance if a sensor is triggered for 1 sec and the alarm duration is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds.

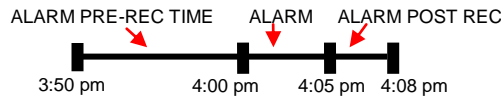
TRIGGER-OFF DELAY: This is a period of time in which rapid activations/deactivations can occur, which must not be considered. Commonly this option is applied when direction indicators or hazard lights are connected to a trigger sensor, in which case, the off-time should be ignored.

METADATA CAPTURE: This option should never be deactivated as it allows users to record tracking information, temperature, voltage and G-Force data. This is displayed in MDR-Dashboard 2.0 and MDR-Player 2.0.

HDD/SD OVERWRITE: This option is **On** by default, therefore, once the HDD has 4GB of space remaining (1GB for SD card), older recordings are erased and replaced by newer recordings. This is valid with the exception of alarms that are locked for a time specified by **LOCKED FILE RETENTION**. By deactivating **HDD/SD OVERWRITE** the MDR will stop recording when the HDD reaches 2GB of free space. The user must either replace the storage or manually delete recordings.

LOCKED FILE RETENTION: This represents the length of time (in days) for which alarms cannot be overwritten by the MDR. When the retention expires, the locked files will automatically be unlocked and deleted.

ALARM PRE-REC TIME: This value specifies the length of time prior to an alarm recording. This will be added before the actual alarm. For example, if **ALARM PRE-REC** is set to 10 minutes and an alarm of 5 minutes is triggered at 4:00pm and **ALARM POST REC** is 180 seconds, the alarm recording will begin at 3:50pm and will end after 4:08pm (see *Alarm Recording Times Figure 23*).



Alarm Recording Times Figure 23

SD CARD TYPE: This option is set to **Internal** as Brigade’s MDRs are provided with 32GB or 64GB internal SD cards. Choose **External** if a fireproof box (optional accessory) is connected to the MDR via its USB-B port on the back.

RECORD MODE OF STORAGE: **Mirror** (simultaneous) recording is active by default. Recordings at sub-stream quality are automatically saved onto the internal or external SD card (see SD card type above). Turn this option **Off** when an SD card is not present in the unit. SD card data does not include metadata (blackbox data).

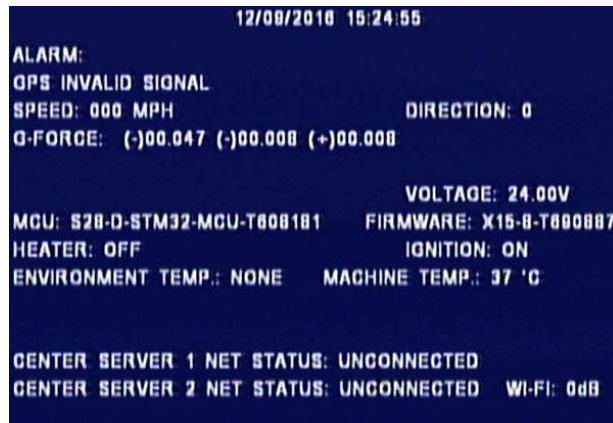
Note: When SD cards/HDDs are replaced, it must be formatted using an MDR prior to use, as explained in 6.1 HDD/SD Formatting.

VIDEO LOSS REC: when this is set to **On** the MDR will record channels that have video loss (blank screen).

4.1.2 OSD Overlay

This section explains the options available for selecting information to be displayed on the monitor information window and on the recording.

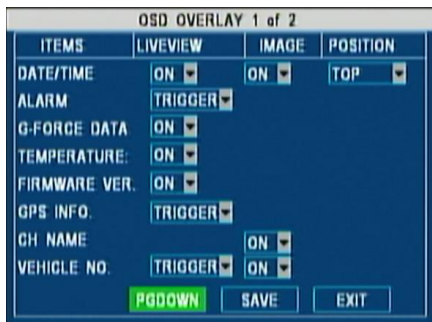
- (a) By selecting the **ENTER** button on the remote control, the quick information (such as temperature, voltage etc.) screen is shown, as indicated in *Quick Information Screen Figure 24*. This is dependent on MDR model and configuration. Additional quick information may be displayed by pressing **ENTER>DOWN**.



Quick Information Screen Figure 24

- (b) This information can be configured by browsing to **Settings → Record → OSD Overlay**. These are configurable options ('On' or 'Off') which are found under the **LIVEVIEW** column as shown in *OSD Overlay 1 of 2 Figure 25* and *OSD Overlay 2 of 2 Figure 26*.

Note: Some fields have **Trigger** and **Fixed** in place of **On**. **Trigger** means that the value can be displayed only when the **ENTER** button is selected, whereas **Fixed** means that this value is displayed on the live monitor view at all times.



OSD Overlay 1 of 2 Figure 25

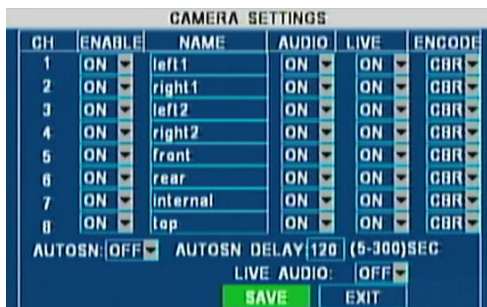


OSD Overlay 2 of 2 Figure 26

- (c) The **IMAGE** column means that the selected variable will be embedded in the recording. Embedding information in the video means that this will form part of the image replacing camera pixels.
- (d) **POSITION** is used to control the location of **DATE/TIME** on the MDR video output screen.
- (e) The advantage of embedding this data in the image is that the video file can be exported to .AVI and the video will contain the embedded information.
- (f) These video files can be played by standard players like Windows Media Player™ or Video LAN Client™.
- (g) The disadvantage in using this feature is that the area occupied by this text does not contain video information, which is lost.
- (h) By selecting **PGDOWN**, users will enter the second page of the **OSD OVERLAY** which shows only one option related to displaying the **Speed** (*OSD Overlay 2 of 2 Figure 26*).

4.1.3 Camera Channel Settings

- (a) This section explains common camera channel settings which can be found by browsing to **Settings → Record → Camera Settings**. A window will appear as shown in *Camera Settings Figure 27* which shows a table with 4 (MDR-404xx-500) or 8 (MDR-408xx-1000) channels.



Camera Settings Figure 27



8 Channels Activated Figure 28



6 channels Activated Figure 29

From left to right (on the same row), there are the following options:

- (b) **ENABLE** allows the activation/deactivation of the camera channel. This should be used if not all camera channels are utilized. This will avoid video loss errors for unused channels.
- (c) **NAME** is used for an 8 character name which each camera channel can be associated with. These can include lower/upper alphanumeric characters. See 8 Channels Activated Figure 28 for an example.

- (d) **AUDIO** activation allows users to enable/disable the audio recording from the camera channels individually. This setting depends on the utilised cameras having microphones.
- (e) **LIVE** determines if a particular channel needs to be displayed or not. Such as, a particular camera will not be displayed but be recorded. This allows for larger spaces to be allocated to the remaining cameras. There are two examples above in which 8 cameras are activated (8 Channels Activated Figure 28) and in which 2 camera channels (CH2 and CH4) have **LIVE** view turned **Off** (6 channels Activated Figure 29).

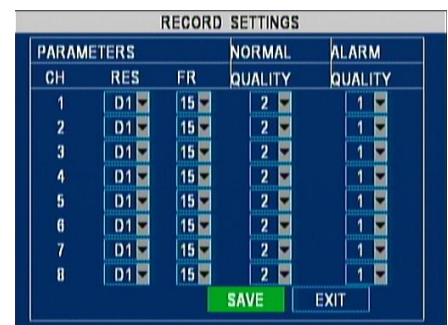
Note: Displaying of the channels can be changed to optimise the space (CH1 camera has been enlarged since it gained the space left by removing CH2 and CH4).

- (f) **ENCODE** allows users to choose between Constant Bit Rate (**CBR**) and Variable Bit Rate (**VBR**). The difference is minimal as the Variable Bit Rate is not efficient as it involves more processing power and may introduce some visible artefacts due to higher compression rates.
- (g) **AUTOSCAN** activation and **AUTOSCAN DELAY** allows users to specify a periodic rotation in displaying the cameras in **LIVE** mode (i.e. the ones that have **LIVE** set to **On**). The rotation will start from a split view with all cameras then switch to each camera channel every X seconds (where X is specified in the **AUTOSCAN DELAY** box). This cycle skips cameras that have **LIVE** set to **Off**.
- (h) **LIVE AUDIO** activation allows users to hear the audio coming from each camera every time a camera is selected manually (by selecting the number key on the remote control) or when cycling (see *Camera Settings Figure 27*).

Note: A Brigade monitor with built-in audio functionality should be used.

4.1.4 Record Settings

- (a) This section explains the process of selecting adequate image quality for individual camera channels. *Record Settings Figure 30* illustrates the main window found by browsing to **Settings** → **Record** → **Record Settings**. This appears as a table with 4 (MDR-404xx-500) or 8 (MDR-408xx-1000) channels.
- (b) **RES** allows users to choose the resolution for each channel. For MDR-404XX-500, the maximum resolution can be achieved for all the 4 channels at maximum frame rate i.e. D1 @ 25fps (PAL) or D1 @ 30fps (NTSC) where D1 is 704x480 for PAL and is 704x576 for NTSC.
- (c) For MDR-408XX-1000, the frame rate has to be lowered to 12fps (PAL) and 15fps (NTSC) for D1 resolution when used on more than 4 channels at the same time.
- (d) In order to save storage space, HD1 and CIF options are available where HD1 is 704x240 for PAL, 704x288 for NTSC. CIF is 354x240 for PAL and 354x288 for NTSC. Both HD1 and CIF are available at 25fps (PAL) and 30fps (NTSC) for the maximum number of channels.
- (e) **FR** allows users to choose different frame rates for different channels depending on **RES** setting (*Record Settings Figure 30*).
- (f) **QUALITY** levels are used for Normal and Alarm recording. Level 1 is the best quality whereas level 8 is the lowest quality. Brigade recommends using a higher quality for Alarms for a higher level of image detail.

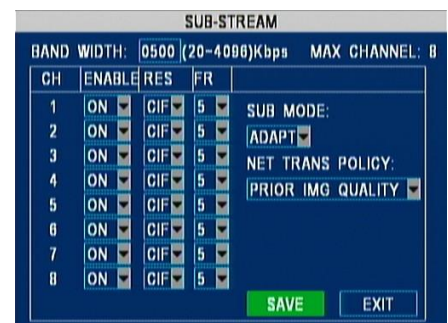


Record Settings Figure 30

Note: Refer to Appendix 13.1 Video Quality Table for further details.

4.1.5 Sub-Stream Settings

- (a) This section elaborates on the sub-stream configuration which allows different quality levels for mirror (simultaneous) recording onto the SD card.
- (b) These settings also control the quality level for Live Video View via mobile network or Wi-Fi connection (depending on model). When using 3G or Wi-Fi, enable all sub-stream channels. Disabling these also disables this channel to be transmitted to the server.
- (c) Mirror recording is used for recovery when the HDD recordings are inaccessible. This is due to the fact that SD cards have smaller storage capacities when compared to HDDs.
- (d) *Sub-Stream Settings Figure 31* illustrates the main window found by browsing to **Settings** → **Record** → **Sub-Stream**.
- (e) **ENABLE** this allows the users to choose which channels are being recorded onto the SD card.
- (f) **RES** is default set to CIF. Framerate can have different values depending on the number of channels activated. Refer to Appendices 13.1 Video Quality Table for further details.
- (g) **BANDWIDTH** can be set to be between 20Kbps and 4096Kbps. It determines the total size of the recording for all active cameras. Refer to Appendices 13.1 Video Quality Table for further details.
- (h) For example, with a full bandwidth of 4096Kbps for recording 8 channels at CIF resolution and 16fps, the total size for 1 hour of recording is approximately 1.8GB. The default settings of 500Kbps has been chosen as a compromise between quality and space. This allows 1 hour of recording 8 channels at CIF resolution, 5fps and quality level 6 to occupy approximately 220MB.
- (i) **SUB MODE** can be adaptive or fixed. The recommended setting is adaptive which alters the bitrate to optimise the memory required.
- (j) **NET TRANS POLICY** is set by default to **PRIOR TRANS SPEED** which allows users to dynamically change the bandwidth according to the image requirement to retain fluidity of the image. **PRIOR IMG QUALITY** gives priority to the quality of the image rather than the size of the sub-stream recording. **BALANCE** uses an optimum trade-off between recording size and image quality.



Sub-Stream Settings Figure 31

4.2 Configuring Events

The following section expands on the process of configuring event parameters for recording and alarm triggering.

4.2.1 Sensors

(a) By navigating to **Settings → Event → Sensor** users will be presented with the following two screens:

NO.	ENABLE	NAME	OSD	SET	ALARM	LOCK
S1	ON	Lx Ind	Lx	HIGH	OFF	OFF
S2	ON	Rx Ind	Rx	HIGH	OFF	OFF
S3	ON	Brake	Bk	HIGH	OFF	OFF
S4	ON	Haz.Wa	HW	HIGH	OFF	OFF
S5	ON		S1	HIGH	OFF	OFF
S6	ON		S2	HIGH	OFF	OFF
S7	ON		S3	HIGH	OFF	OFF
S8	ON		S4	HIGH	OFF	OFF

Sensor Input Figure 32

NO.	FULL SCREEN	3G ACTIVATES
S1	CH 1	OFF
S2	CH 2	OFF
S3	CH 6	OFF
S4	CH 5-8	OFF
S5	NONE	OFF
S6	NONE	OFF
S7	NONE	OFF
S8	NONE	OFF

FULL SCREEN TIME(3-30s) 03 SEC

Sensor Trigger Action Figure 33

- (b) *Sensor Input Figure 32* and *Sensor Trigger Action Figure 33* are displayed. This represents an example where 4 sensors are connected to various signals of the vehicle. Trigger sensor 1 (**S1**) is connected to the left hand indicator and **S2,S3** and **S4** are connected to the right hand indicator, brake and hazard warning light.
- (c) This is reflected in the **NAME** column which allows users to choose 6 alpha-numerical characters including symbols. **NAME** will never appear anywhere aside from this window and is intended to provide the installer a short description of the function.
- (d) **ENABLE** allows users to set which trigger input wires are used. If a wire is not used, set **ENABLE** to **Off**.
- (e) The **OSD** column provides 2 alphanumeric characters that will be shown on the monitor, MDR-Dashboard 2.0 and MDR-Player 2.0 as identifiers. These are highlighted once the sensors turn active. Users should choose two appropriate letters based on the sensor connected.
- (f) **SET** determines whether the trigger sensor is activated with a high or low voltage.
- (g) **ALARM** can be activated and will trigger recordings of the event. If it is **Off**, the activation of the sensor will be recorded in the **Metadata** and displayed on the MDR-Dashboard 2.0 or MDR-Player 2.0. No alarm recording will be triggered.
- (h) **LOCK** feature allows users to choose whether an alarm recording will be locked with a specified time or will be overwritten (see **LOCKED FILE RETENTION** in section 4.1.1 Options).
- (i) *Sensor Trigger Action Figure 33* allows the user to choose a channel to be displayed in full screen once a particular trigger sensor is activated. It also allows the selection of the duration for which a full screen is displayed. In this example, Channel 1 will be displayed once the left hand indicator is active.
- (j) **3G ACTIVATES** is dependent on MDR models, this is used to trigger the mobile network connection based on a trigger input.
- (k) If any **SENSOR** above is set as an **ALARM** and the **OSD** contains two characters, it is possible to display these **OSD** characters when a sensor is triggered. In order to achieve this, set **ALARM LIVEVIEW** to **FIXED**. See 4.1.2 OSD Overlay.

Sensor Priority Order (Highest to Lowest)
S1
S2
S3
S4
S5
S6
S7
S8

4.2.2 Alarm Outputs

(a) By navigating to **Settings → Event → Alarm Output** users will be presented with the following three option screens:

ALARM TYPE	OUT1	OUT2	SNAP
S1	OFF	OFF	OFF
S2	OFF	OFF	OFF
S3	OFF	OFF	OFF
S4	OFF	OFF	OFF
S5	OFF	OFF	OFF
S6	OFF	OFF	OFF
S7	OFF	OFF	OFF
S8	OFF	OFF	OFF

Alarm Output 1 of 3 Figure 34

ALARM TYPE	OUT1	OUT2	SNAP
OVER SPEED	OFF	OFF	OFF
UNDER SPEED	OFF	OFF	OFF
HIGH TEMP.	OFF	OFF	OFF
LOW TEMP.	OFF	OFF	OFF
G-FORCE	OFF	OFF	OFF
VIDEO LOSS	ON	OFF	OFF
MOTION	OFF	OFF	OFF
BLIND	OFF	OFF	OFF

Alarm Output 2 of 3 Figure 35

ALARM TYPE	OUT1	OUT2	SNAP
LOW VOLTAGE	OFF	OFF	OFF
PANIC BUTTON	OFF	OFF	OFF

Alarm Output 3 of 3 Figure 36

- (b) *Alarm Output 1 of 3 Figure 34*, *Alarm Output 2 of 3 Figure 35* and *Alarm Output 3 of 3 Figure 36* have the same layout with 3 columns dedicated to the activation of: **TRIGGER OUT1**; **TRIGGER OUT2** and **Snapshot** function.
- (c) Users can decide whether an **Event** (such as applying a voltage to one of the 8 trigger sensors or by pressing the Panic Button etc.) activates an alarm output (**TRIGGER OUT1** and/or **TRIGGER OUT2** will go high, +12V).
- (d) If the **SNAP** option is **On**, snapshots will be recorded. The selection of the cameras which can be activated for snapshots are configured in 4.2.8 Snap Settings.
- (e) Refer to the following sections: 4.2.3 to 4.2.7 and 7.1 to 7.1.1 for the configuration of the alarms in *Alarm Output 2 of 3 Figure 35* and *Alarm Output 3 of 3 Figure 36*. These configurations determine the conditions for which the trigger outputs and the snapshot would be activated.

4.2.3 Speed

(a) By browsing to **Settings → Event → Speed**, *GPS Speed Settings Figure 37* will appear:



GPS Speed Settings Figure 37

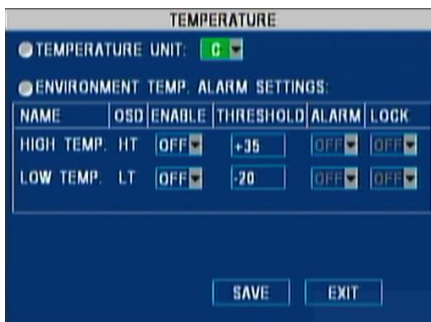


Vehicle Speed Settings Figure 38

- (b) **SPEED SOURCE** allows the choice of either a **GPS** source (*GPS Speed Settings Figure 37*) or the **Vehicle** speedometer signal (*Vehicle Speed Settings Figure 38*).
- (c) In majority of applications **GPS** signal is the simplest to use. Brigade's MDR 400 series comes as standard equipped with a GPS antenna.
- (d) The speed source from the vehicle is recommended when the GPS signal is absent or poor (e.g. mines or major city centres). The **Vehicle** speed signal may be a more reliable source.
- (e) Pulse per second (**p/s**) refers to the **p/s** the MDR receives at a set speed value. The speedometer option requires a chosen speed which is associated to a corresponding **p/s**.
- (f) If using a standard European tachometer, the connections on pin **B8** are used as speed signal (4 pulses per meter). For European speed sources, enter the following values: 57 P/S and either 51 km/h or 32.0 mph.
- (g) For non-European speed sources refer to the manufacturer's datasheet for the vehicle speed signal.
- (h) **SPEED UNIT** this option is set to **miles per hour** as default and can be changed to **km per hour** based on the country in which the vehicle is utilised.
- (i) **CURRENT MILEAGE** this represents the mileage of the vehicle at the time of the installation and is an extra option for additional tracking information. In order to configure this, select **MILEAGE** to **On**.
- (j) **CALIBRATE** this saves **CURRENT MILEAGE** to memory. This can be checked by navigating to **Information → History → Total Mileage**.
- (k) **ALARM SETTINGS** allows the user to activate alarms for under speed, over speed or both by changing the **ENABLE** field to **On** and inputting the limits into the **THRESHOLD** box. If the **ALARM** field is turned **On**, an under speed or over speed will be recorded as an alarm and can be locked by turning the **LOCK** field to **On** (see **LOCKED FILE RETENTION** in section 4.1.1 Options).

4.2.4 Temperature

(a) By navigating to **Settings → Event → Temperature** users will be presented with *Temperature Settings Figure 39*.



Temperature Settings Figure 39

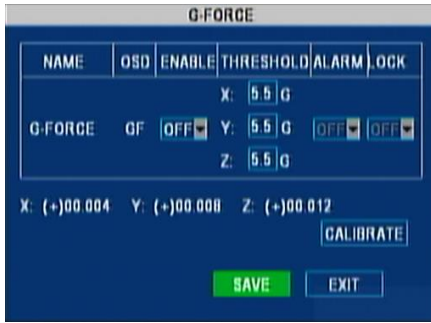


Temperature Alarm Notification Figure 40

- (b) **TEMPERATURE UNIT** is in degrees Celsius (°C) by default and can be changed to degrees Fahrenheit (°F) according to the country in which the vehicle is utilised.
- (c) **ENVIRONMENT TEMPERATURE ALARM SETTINGS** allows users to set the thresholds for which the MDR temperature would be considered to be outside specified limits.
- (d) An internal temperature sensor lets users monitor the **MACHINE TEMP** (MDR) on the Quick information screen (ENTER button).
- (e) Turn **ENABLE On** in order to activate one or both limits and specify the values under the **THRESHOLD** column. If the **ALARM** column is kept **Off**, the Low Temperature or High Temperature events would only be shown in MDR-Dashboard 2.0 and MDR-Player 2.0.
- (f) By choosing to activate the **ALARM**, the recording for such an event would be treated as an alarm and the **LOCK** feature can be used (see **LOCKED FILE RETENTION** in section 4.1.1 Options).
- (g) In order to show the alarm on the monitor (*Temperature Alarm Notification Figure 40*), it is necessary to configure the **OSD** where **ALARM** can be **TRIGGER** or **FIXED** (as explained in 4.1.2 OSD Overlay).

4.2.5 G-Force

(a) *G-Force Settings Figure 41* is displayed by browsing to **Settings → Event → G-Force**.



G-Force Settings Figure 41



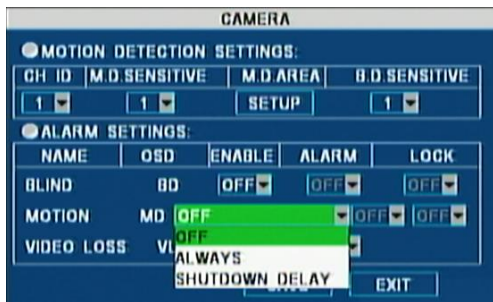
G-Force Alarm Notification Figure 42

- (b) There are 3 values for the X, Y and Z axes, where: X represents the forward/backward axis (i.e. travelling forward with the MDR-408XX-1000 handle indicating the front and the connectors on the back indicating the rear); Y represents left/right; Z represents up/down.
- (c) The MDR-404xx-500 needs an optional external G-sensor.
- (d) The MDR-408xx-1000 has an internal G-sensor. Please refer to the drawing for mounting. In order to use the internal G-sensor on the MDR-408XX-1000, configure the External Communication to **Off** in the MDR OSD menu, which is the port dedicated to the G-Sensor (by default RS485-2). The unit would then restart with the internal G-Sensor activated.
- (e) The internal or external G-sensor requires calibration before use. Once the unit is installed (on level horizontal ground) with the vehicle stationary (no vibrations/engine off), select the **CALIBRATE** button (*G-Force Settings Figure 41*). Refer to section 4.4 Peripheral Settings for the configuration of the G-Sensor.
- (f) Turn **ENABLE On** to activate the limits and specify the 3 **THRESHOLD** values. If the **ALARM** column is set as **Off**, high acceleration events would only be visible in the MDR-Dashboard 2.0 and MDR-Player 2.0.
- (g) By choosing to activate the **ALARM**, the recordings for such events would be treated as alarms which may be locked (see **LOCKED FILE RETENTION** in section 4.1.1 Options).
- (h) In order to show the alarm on the monitor (*G-Force Alarm Notification Figure 42*), it is necessary to configure the **OSD** where **ALARM** can be **TRIGGER** or **FIXED** (as explained in 4.1.2 OSD Overlay).

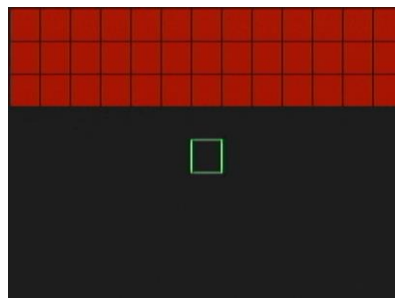
Note: G-Sensor values are digitally sampled and only provide an average indication of the shock data. For the MDR vibration and shock rating, see section 17 Specifications.

4.2.6 Motion Detection

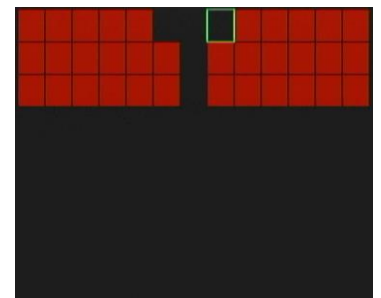
(a) In order to activate and configure motion detection features, browse to **Settings → Event → Camera**. Users will be presented with *Camera Event Settings Figure 43*:



Camera Event Settings Figure 43



Initial Motion Detection Setup Figure 44

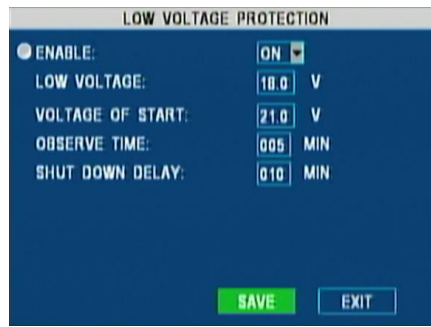


Setting up Motion Detection area Figure 45

- (b) **ENABLE** is used to turn a camera feature on/off.
- (c) Motion detection can be activated per channel. Each channel can have different sensitivities and different areas of detection. See *Camera Event Settings Figure 43*.
- (d) Motion detection has two enable options, **ALWAYS** and **SHUTDOWN DELAY**. **ALWAYS** allows motion detection to detect whenever the MDR is on. **SHUTDOWN DELAY** allows the MDR to detect only during the specified shutdown delay period.
- (e) First select the channel and its sensitivity (1 represents high sensitivity and 4 is the least sensitive).
- (f) Select **SETUP**, and use the arrows in the remote control to select desired cells. Red cells are cells where detection occurs.
- (g) By pressing the **ENTER** button users can toggle between selecting and deselecting cells.
- (h) Press **SAVE** before exiting at the bottom of each page.
- (i) In the example shown in *Initial Motion Detection Setup Figure 44*, the top of the image is fully selected for detecting movements. *Setting up Motion Detection area Figure 45* illustrates a "T"-shaped area excluded from motion detection. Generally, sensitivity level 1 is a typical option for detecting unexpected movements.
- (j) In *Camera Event Settings Figure 43* users must enable **MOTION**. By choosing to activate the **ALARM**, the recording for such an event would be treated as an alarm.
- (k) This can have a **LOCK** feature (see **LOCKED FILE RETENTION** in section 4.1.1 Options). In order to show the alarm on the monitor (with the letters **MD** appearing on the screen), it is necessary to configure the **OSD** where **ALARM** can be **TRIGGER** or **FIXED** (as explained in 4.1.2 OSD Overlay). Refer to section 4.2.2 which controls when this alarm should activate alarm outputs or snapshots.

4.2.7 Voltage

(a) *Low Voltage Protection Figure 46* illustrates the main window displayed by browsing to **Settings → Event → Voltage**:



Low Voltage Protection Figure 46

- (b) In order to activate low voltage protection, turn the **ENABLE** cell **On**.
- (c) This feature shuts down the MDR when the supply voltage falls below the Voltage specified in **LOW VOLTAGE**.
- (d) **VOLTAGE OF START** is the minimum voltage required to turn **On** the MDR after a low voltage shutdown.
- (e) The MDR verifies this value (before powering on) to confirm the battery has been recharged/replaced and is fully operational. **SHUT DOWN DELAY** specifies the period the MDR will count down before shutting down (expressed in minutes).
- (f) In this example **VOLTAGE OF START** has been left to its default value of 21.0V.
- (g) **OBSERVE TIME** range is 1-300 minutes. This refers to the duration for which a voltage, lesser than **LOW VOLTAGE** must be observed before beginning the **SHUT DOWN DELAY**.
- (h) If the MDR is running on a 12V supply **LOW VOLTAGE** minimum is 8V and **VOLTAGE OF START** maximum is 13V.
- (i) If the MDR is running on a 24V supply **LOW VOLTAGE** minimum is 16V and **VOLTAGE OF START** maximum is 26V.

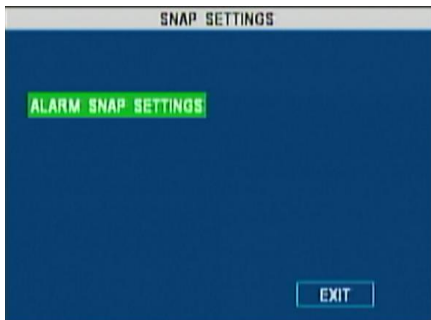
Proposed Low Voltage Protection Settings (Note: Please check if these are suitable for the particular vehicle):

12V Vehicles	24V Vehicles
Low Voltage:11.7V	Low Voltage:23.7V
Voltage of Start:12.5V	Voltage of Start:24.5V
Observe Time:15 minutes	Observe Time: 15 minutes
Shut Down Delay:5 minutes	Shut Down Delay:5 minutes

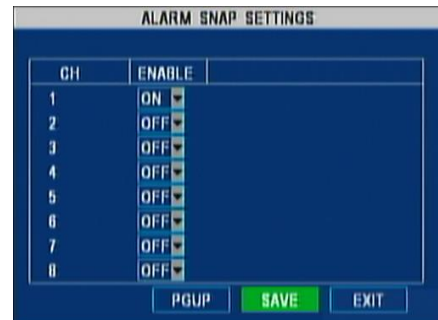
Note: In this example *Low Voltage Protection Figure 46*, whenever the voltage of the battery connected to the MDR falls below 18.0V (sustained for 5 minutes), the MDR will automatically shut down after 10 minutes to protect the battery from any further drainage that could damage it. MDR will not turn on until it detects a voltage of 21.0V.

4.2.8 Snap Settings

- (a) By browsing to **Settings → Event → Snap Settings → Alarm Snap Settings**, *Snap Settings Screen Figure 47* and *Alarm Snap Settings Figure 48* will be displayed. This sub-menu allows users to select the cameras that snapshot when an alarm is triggered, as explained in section 4.2.2 Alarm Outputs.
- (b) For instance, the activation of a trigger sensor, such as S4, could trigger a snapshot of camera 1. The user can also snapshot camera 1 when other alarms are activated, such as motion detection, panic button or low voltage.



Snap Settings Screen Figure 47



Alarm Snap Settings Figure 48

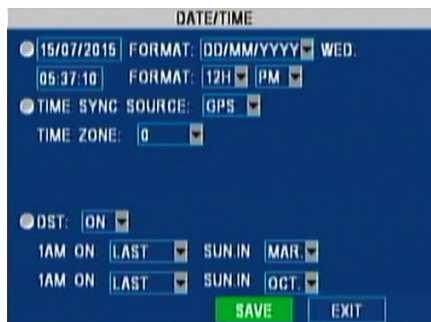
- (c) In order to export snapshots to a USB pen-drive, refer to sub-sections 6.4.3 and 6.4.4 under System Log.
- (d) There is no limitation of the number of snaps, but this uses the same storage limit as recordings. If the storage is full, then the oldest snap will be written over.
- (e) Snaps are stored in the same area on the HDD, but these are distinguished from recordings by its filename.

4.3 System settings

The following section explains the process of configuring vehicle settings and security related parameters.

4.3.1 Date/Time

- (a) Browse to **Settings** → **System** → **Date/Time**, *Date and Time Settings Figure 49* will be shown. This allows users to select the format of the date and time according to the country in which the vehicle would be utilised.

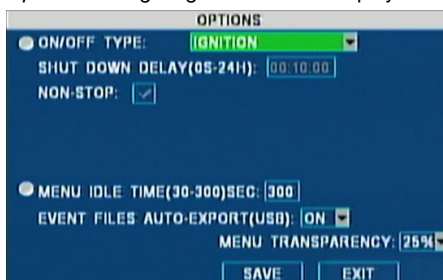


Date and Time Settings Figure 49

- (b) **TIME SYNC SOURCE** allows the selection of either a **GPS** source or to be entered manually. In majority of the applications, **GPS** signal is the simplest and more reliable option.
- (c) Brigade's MDR 400 series systems are equipped as standard with GPS antenna.
- (d) The manual option is recommended when a GPS signal is absent or poor (e.g. mines or major city centres). Entering the date and time can be set by completing the fields accordingly.
- (e) In the example above, move the cursor to **15/07/2015** then to **05:37:10** and edit the current values. When selecting the time sync source as **GPS**, it allows users to enter the time zone (in the example above, 0 means that the vehicle is operating in the GMT zone).
- (f) **DST** this field allows users to enter the date and time in which the Daylight Saving Time will be activated. In the U.K, it is the last Sunday of March at 1:00 AM and the last Sunday of October at 1:00 AM. Enter the correct time and date of the country in which the vehicle will be utilised. Whenever **DST** is not in use, turn this option to **Off**.

4.3.2 Options

- (a) Browse to **Settings** → **System** → **Options**, *Options Settings Figure 50* will be displayed.



Options Settings Figure 50

- (b) **ON/OFF TYPE**: this option determines the conditions for which the MDR will power up. By default it is set to **IGNITION**, which means that the MDR only turns **On** when an ignition signal is applied (yellow wire on MDR-400-PC).
- (c) Once the ignition is removed, the unit will start a countdown (in seconds) based on the **SHUT DOWN DELAY** setting.
- (d) Brigade recommends 30 minutes for typical applications. Enter a preferred value between 0 seconds and 24 hours if necessary.
- (e) **NON-STOP** enables the MDR to run continuously. Ensure the **LOW VOLTAGE** protection feature is used on conjunction with this setting.
- (f) The MDR will auto boot up if no ignition is applied.

Warning

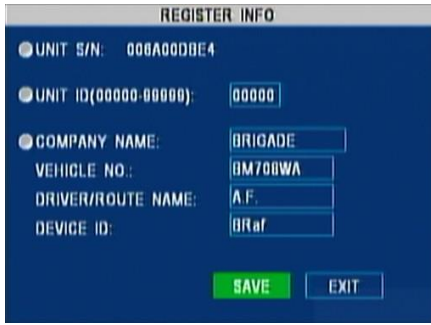
- **Using the NON-STOP feature can drain a vehicles battery if used for prolonged periods of time. Brigade will not be responsible for any damage caused due to incorrect usage.**
- (g) Two more additional options are available for the **ON/OFF TYPE**:
- **TIMER** where boot-up and shut down times are specified (ignition signal must be present prior to ensure MDR is in an **On** state). In addition, a scheduled option is available that allows users to specify scheduled recording times. The MDR will not turn **Off** during scheduled **On** times. Refer to section 7.3 Scheduled Recording to configure these timeframes.
 - **IGNITION OR TIMER** various combinations of these options are used to start up and shut down the MDRs.

Note: The ignition signal takes precedence in all scenarios, which means that if the MDR has no ignition signal applied then the unit cannot enter an **On** state.

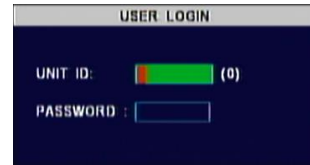
- (h) **MENU IDLE TIME**: specifies the time of inactivity for which the **OSD** will remain **On**. By default it is set to **300 seconds** (5 minutes).
- (i) **EVENT FILES AUTO-EXPORT (USB)**: this option is **On** by default and allows users to export all alarm recording files of the same day to a USB pen-drive plugged into the front of the unit by simply pressing the **F1** key on the remote control.
- (j) **MENU TRANSPARENCY**: this option controls the opacity of the **OSD** menu.

4.3.3 Register Info

(a) Browse to **Settings → System → Register Info**, Register Information Figure 51 will be displayed:

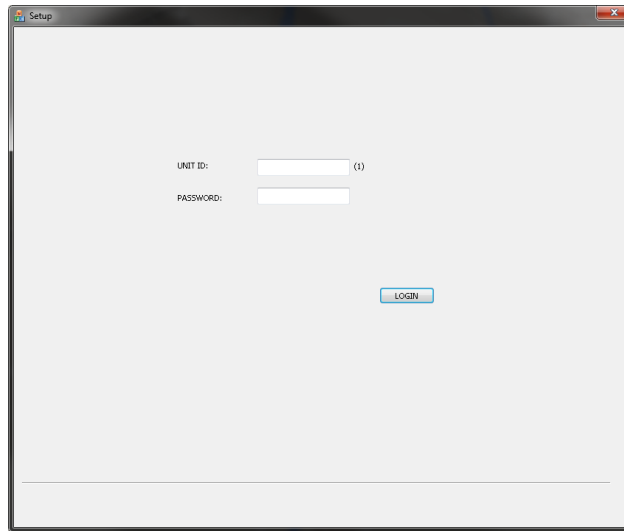


Register Information Figure 51



User Login Figure 52

- (b) **UNIT S/N** this represents a unique serial number which identifies each unit. This is not configurable by the user.
- (c) **UNIT ID:** enter a number from 00000 to 99999 to represent the "username". By default, this is 0 as shown in User Login Figure 52. If multiple units are installed next to each other, Brigade recommends using different **UNIT IDS** and **PASSWORDS** (see section 4.3.4). In addition, this number will appear in MDR-Dashboard 2.0 when accessing a wireless MDR settings page as depicted in MDR-Dashboard 2.0 Unit Login Figure 53 (depending on model):



MDR-Dashboard 2.0 Unit Login Figure 53

Note: If password security is enabled, this value is a required input. Please, refer to the following section 4.3.4 User Security.

- (d) **COMPANY NAME** this field is discretionary, as the MDR can function without configuring this field. Enter the name of the company in which the MDR will be utilised. There are 9 available characters to set using the following: a-z; A-Z; 0-9 and symbols.
- (e) **VEHICLE NO.** this is an optional field. It is typically used to store the registration plate of the vehicle in which the MDR is installed. Eight alphanumerical characters are accepted (a-z; A-Z and 0-9). Company name and vehicle number are shown on both the MDR-Dashboard 2.0 and MDR-Player 2.0, see MDR-Dashboard 2.0 Server Mode Details Figure 54:

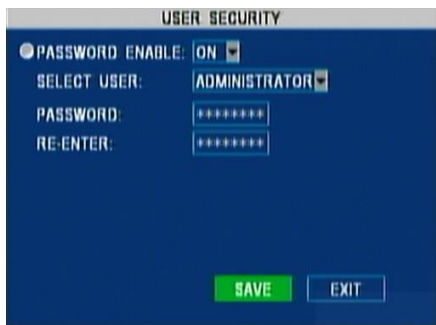
Vehicle Number	MDREE
Device ID	MDREE
Group	Brigade Wi-Fi Server
Type	MDR
Longitude	0.245000
Latitude	51.402222
Speed	0 KMH
Time	13:22:56 02-05-2016

MDR-Dashboard 2.0 Server Mode Details Figure 54

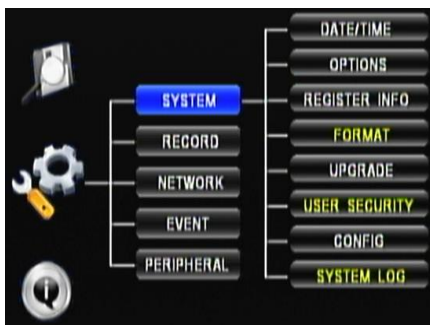
- (f) **DRIVER/ROUTE NAME** this is not a compulsory field for users. When the MDR is fitted in a vehicle that can be identified by a fixed name, it would be recommended to fill in this field. There are 8 available characters which are: a-z; A-Z; 0-9 and symbols.
- (g) **DEVICE ID** this field is vital when configuring the MDR-404GW-500 and MDR-408GW-1000 (and sub-variants equipped with 3G and/or Wi-Fi modules). Along with **UNIT ID**, these are the only means for MDR-Dashboard 2.0 to interact with the MDR and both fields must be completed. Eight alphanumerical characters are accepted (a-z; A-Z and 0-9).
- (h) **DEVICE ID** should NOT have any spaces. Device ID = Serial Number in MDR-Dashboard 2.0.

4.3.4 User Security

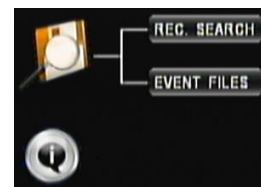
(a) Browse to **Settings** → **System** → **User Security**. *User Security Figure 55* will be displayed.



User Security Figure 55



Power User Menu Figure 56



User Menu Figure 57

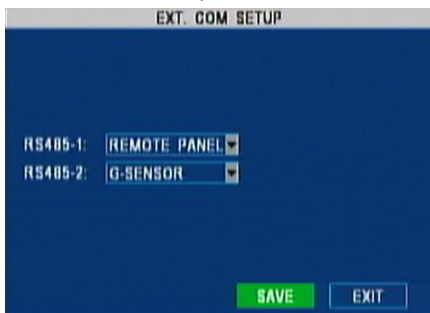
- (b) By default the **UNIT ID** is **0**. The password for each user type follows:
- Administrator Password: 88888888
 - Power User Password: 66666666
 - User Password: 22222222
- (c) There are three levels of security depending on the user account. The respective password can only be changed by logging in as **Administrator**.
- (d) By logging in as a **Power User**, **FORMAT**, **USER SECURITY** and **SYSTEM LOG** options (*Power User Menu Figure 56*) are not accessible. Formatting the storage media (**FORMAT**) and accessing/deleting system log or snapshots (**SYSTEM LOG**) are not allowed. It is not possible to browse to these sub-menus.
- (e) The image (*User Menu Figure 57*) illustrates the two menus accessible by logging in as **User**. Recordings can be viewed, exported and information accessed regarding modules or historic data collection.
- (f) By switching **PASSWORD ENABLE Off**, security is disabled and access is equivalent to an **Administrator** user which allows modifying every single parameter and deleting any data. Brigade encourages changing passwords periodically for all the three security levels and keeping these credentials secured.

4.4 Peripheral Settings

This section explains the process of configuring the communication port related to the optional accessories.

- (a) Remote Panel is configured to be plugged into port 1 of the RS485 and the External G-Sensor to be plugged into port 2. The cable loom MDR-408-TRIG is labelled with labels for the G-SENSOR and REMOTE PANEL.
- (b) MDR-404xx-500 has a single option since this device is equipped with a single RS485 port.
- (c) Browse to **Settings** → **Peripheral** → **Ext. Com Setup**, *Peripheral External Communication Setup Figure 58* will be displayed.

Note: This image illustrates an example for MDR-408XX-1000. The equivalent for MDR-404xx-500 will not have the RS485-2 option.



Peripheral External Communication Setup Figure 58

5 Recordings

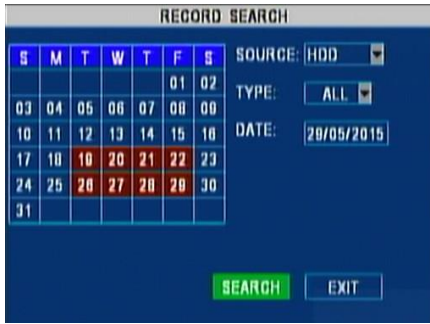
This chapter describes the operation of the MDR once it has been setup successfully.

Note: When accessing the menu, recording stops and only resumes when the setup menu is closed.

Warning: The start-up time to recording for the MDR-404xx-500 is approximately 80 seconds. The start-up time to recording for the MDR-408xx-1000 is approximately 90 seconds. Please wait at least 3 minutes after ignition is applied. Brigade will not be responsible for any events not recorded during this start-up period. There are three ways in which a user can tell if the MDR is recording: a visible red 'R' (HDD) and a blue 'R' (SD card) on each channel; MDR REC LED will be on; Remote Panel REC LED will be on (optional accessory).

5.1 Record Search by Type

(a) *Recording Search Figure 59* illustrates the main window displayed by browsing to **Recordings → Rec. Search**



Recording Search Figure 59



Recording Channel Search Figure 60

- (b) *Recording Search Figure 59* shows a calendar view for the current month. Change the **DATE** in order to move to any previous month view.
- (c) Select the **SOURCE**, which can be either **HDD** or **MIRROR SD**. The HDD contains recordings at normal quality whereas the SD card contains all recordings in sub-stream mode (i.e. at CIF resolution and lower frame rate – see section 4.1.5 Sub-Stream Settings).
- (d) Finally select the **TYPE** of recordings to look for: **ALL** recordings; **ALARM** recordings (if users need to view/export event triggered alarms). Select **SEARCH** and proceed to the next screen (*Recording Channel Search Figure 60*).
- (e) In *Recording Channel Search Figure 60* grey areas (11:21:25) represent a time period with no recordings; red areas (11:24:25) contain at least one alarm during the 15 minute **RECORD FILE TIME** interval (see section 4.1.1); yellow (11:27:25) represents locked alarm files and green periods (11:33:25) are normal recordings.

Note: For the MDR-408xx-1000 only, select **CHANNEL** in order to move to the remaining 4 channels (i.e. 5-8).

- (f) Channels can only be viewed/exported one channel at a time. Select the channel to be viewed/exported (in this example CH1) by browsing with the up/down arrows ▲ ▼ and then selecting the **ENTER** button (the radio button would move to the selected channel).
- (g) Select the timeframe by entering the **START TIME** and **END TIME**. Users will notice that the view of the channels will be refreshed and updated immediately after the cursor will move outside those boxes (i.e. to PLAY).
- (h) Finally select **PLAY** and view the selected recording for the chosen channel.

In play mode:

- ▶ is used as a **Pause** button. By pressing it repeatedly, it changes to **STEP** mode which enables a “frame by frame” playback.
- ▶ is the standard **Play** button.
- ⏪ is the **Slow** button and allows users to play at 1/2, 1/4 and 1/8 of the standard speed.
- ➔ is the **GoTo** button which allows users to enter a **time inside** the timeframe selected by **START TIME** and **END TIME**.
- ◀ is the **Rewind** button that can rewind the video at 2x, 4x and 8x.
- is the **Fast Forward** button that can playback the video at 2x, 4x and 8x.

- (i) **UNLOCK** is used to unlock recordings that were previously marked as locked (see **LOCKED FILE RETENTION** in section 4.1.1 Options).

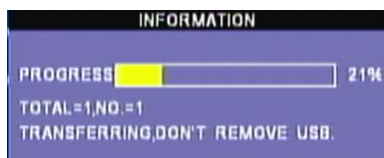
Note: If playback of a particular video recording is in a different video format from the current settings, it cannot be played. Please, switch the **VIDEO FORMAT** to the correct format (see section 4.1.1 Options).

5.1.1 Exporting Recordings

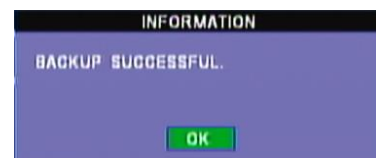
- (a) Plug a USB flash drive into the front USB port of the MDR and select **EXPORT**.

Warning: Do not connect an external HDD to the front USB port. Only USB Flash drives (which contain flash memory) is supported by this port. Brigade will not be held responsible for incorrect use of this port.

- (b) An option to select a single channel or all channels will be shown.
- (c) A progress bar (*Export Progress Bar Figure 61*) is displayed, indicating the TOTAL number of files and the current file number exported.



Export Progress Bar Figure 61

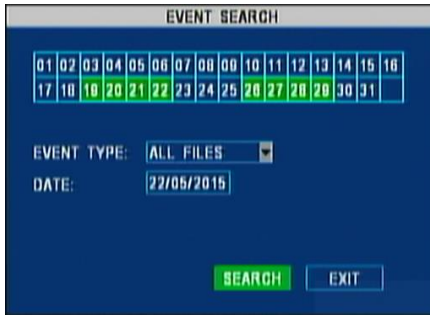


Export Complete Figure 62

- (d) Once the exporting is complete, a confirmation window will appear above (*Export Complete Figure 62*), unless an error has occurred such as no external storage detected or a lack of memory space.
- (e) The files stored on the USB will be raw proprietary data (H.264). In order to read these files, users must use MDR-Dashboard 2.0.
- (f) Please see section 8.6 Loading from a USB flash drive or Folder for further information.

5.2 Event Files Search by Type

(a) *Event Search Figure 63* illustrates the main window shown by browsing to **Recordings → Event Search**.



Event Search Figure 63

SEL	TYPE	NAME	DATE	TIME	REC	
<input type="checkbox"/>	A	MD	2015-05-22	14:10:00	R	FIRST
<input type="checkbox"/>	E	VL	2015-05-22	14:00:47	R	PGUP
<input type="checkbox"/>	E	VL	2015-05-22	14:07:57	R	PGDOWN
<input type="checkbox"/>	A	MD	2015-05-22	14:07:53	R	LAST
<input type="checkbox"/>	A	SHK	2015-05-22	14:07:51	R	REV
<input type="checkbox"/>	A	MD	2015-05-22	14:07:40	R	EX LOG
<input type="checkbox"/>	E	VL	2015-05-22	14:07:44	R	EXPORT
<input type="checkbox"/>	A	MD	2015-05-22	14:00:00	R	EXIT

Event List Figure 64

Similar to *Recording Search Figure 59*, this shows a calendar view for the current month.

(b) Change **DATE** in order to move to any previous month. **EVENT TYPE** allows selecting the kind of event which can be as follows:

- TRIGGER INPUT for trigger sensor alarms. See section 4.2.1
- G-FORCE for alarms related to acceleration. See section 4.2.5
- SPEED for alarms related to low/high speed. See section 4.2.3
- TEMP. ALARM for alarms related to low/high temperature. See section 4.2.4
- MD ALARM for motion detection activation. See section 4.2.6
- BD ALARM for camera blind detection
- VIDEO LOSS for alarms triggered when no video is detected from cameras

(c) By selecting **SEARCH** the *Event List Figure 64* will be shown. This illustrates all events for the day.

(d) Using the up/down arrows ▲ ▼ and then pressing the **ENTER** button on the remote control, users can select the event (E) or alarm (A) and an X will appear under the **SEL** column.

(e) The **TYPE** column indicates if this is an event or an alarm, whereas the **NAME** gives an indication of the type of event. In the example above, there are motion detection (MD), video loss (VL) and G-Force shock (SHK).

(f) In addition there is a **DATE** and **TIME** of the event and a red letter **R** under the **REC** column to indicate if a recording is associated to the event. For further details on the meaning of the event **NAME**s, please, refer to 13.5 Events Table.

(g) Four buttons allows users to browse pages. **FIRST** and **LAST** moves to the first and last entry respectively. **PGUP** and **PGDOWN** allows users to scroll up and down the pages

(h) **REV** is a useful feature which allows users to inverse the selection of the entries on the same page. In other words, the cells already denoted with an X, will be blanked and the blanked ones will be marked with an X.

5.2.1 Exporting Log Files

There are two types of export functions:

- **EX LOG** allows users to export the selected entries (*Event List Figure 64*) onto a USB flash drive plugged into the front of the MDR in the form of a log file which will be stored in the folder containing the recordings for the same day. The location follows the format \MDVR-X05\UUUUU\YYYY-MM-DD\log\event and can be read using Notepad™.
- **EXPORT** allows users to export the selected event/alarm video files (*Event List Figure 64*) onto a USB flash drive.

Note: Ensure the red letter R is present for the selected event otherwise an error message will appear stating that no related video file is present.

6 Miscellaneous

This chapter explains features that are not frequently used, but constitute important information about configuration and diagnostic routines.

6.1 HDD/SD Formatting

(a) Browse to **Settings → System → Format** and *Format Figure 65* will appear. Devices to format are below:

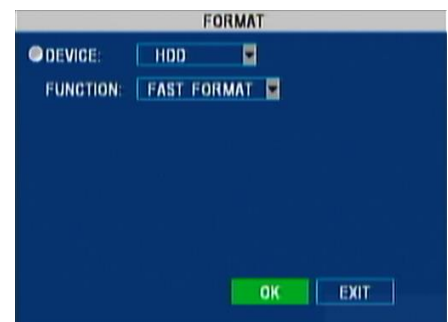
- **HDD** – main storage medium.
- **USB** – whenever a USB flash drive is plugged to the front of the MDR.
- **MIRROR SD** – internal SD card or the fireproof box (optional accessory).

(b) The user chooses whether a **FAST FORMAT** or **SLOW FORMAT** is suitable.

(c) In order to format the fireproof box, **SD CARD TYPE** must be set to external (see section 4.1.1 Options).

Note: **SLOW FORMAT** is only available for **HDD**. It will analyse the disk for any bad sectors and attempt to repair them. If repairing is not possible, these sectors will not be used to prevent any data loss.

(d) After formatting the device, the MDR will restart automatically.



Format Figure 65

6.2 Firmware Upgrade

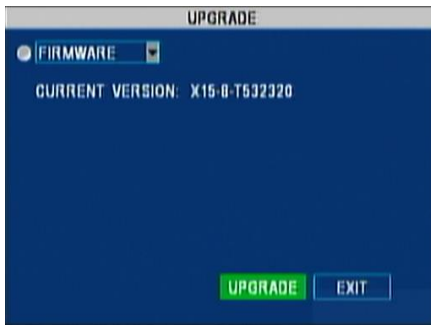
There are two kinds of software which may need upgrading. These are:

1. **FIRMWARE** – this is OSD related software and directly affects the user interface.
2. **MCU** – this is software related to hardware functions.

(a) By using a PC, create a folder named **dvrupgrade** in the root directory of a USB flash drive.

Warning: Do not connect an external HDD to the front USB port. Only USB Flash drives (which contain flash memory) is supported by this port. Brigade will not be held responsible for incorrect use of this port.

- (b) Copy either the MCU or Firmware files (or both).
- (c) Plug the USB flash drive onto the front of the MDR and then browse to **Settings → System → Upgrade** and *Upgrade Figure 66* will appear.



Upgrade Figure 66



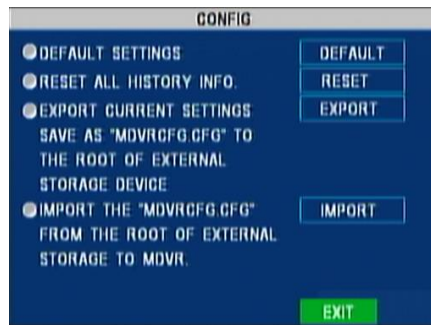
System Updating Figure 67

- (d) Select the appropriate upgrade as explained above and select **UPGRADE**. *System Updating Figure 67* will appear.
- (e) After the upgrade, the MDR will restart. Check if the Firmware/MCU has been upgraded successfully by pressing the **ENTER** button on the remote control.

Warning: Ensure the flash drive is not unplugged from the MDR during this process. Power must be supplied to the MDR without any interruption. Both firmware and MCU upgrades are very sensitive operations and any power loss may permanently damage the MDR.

6.3 Configuration

There are different configuration files for 4 channel and 8 channel models. This section explains four main functions related to configuration management. Browse to **Settings → System → Config** and *Configuration Figure 68* will appear:



Configuration Figure 68

6.3.1 Restoring Default Settings

Use this feature to restore the configuration to its default factory settings. Any configuration will be lost, except video recordings and historical data (highest/lowest temperature, mileage etc.). Select the **DEFAULT** button next to the **DEFAULT SETTINGS**.

6.3.2 Resetting History Info

This feature is used to clear any previous data relating to vehicle information such as minimum and maximum voltage, temperature, mileage etc.

6.3.3 Exporting Current Settings

In the case of using an existing vehicle configuration on several other vehicles, the MDR provides an 'export to USB' (current configuration) flash drive feature.

Warning: Network settings and Register Info settings are not contained in a configuration file. In order to support MDR fleet setups with an identical configuration file.

- (a) Plug an **empty** USB flash drive into the front USB socket of the MDR.

Warning: Do not connect an external HDD to the front USB port. Only USB Flash drives (which contain flash memory) is supported by this port. Brigade will not be held responsible for incorrect use of this port.

- (b) Select **EXPORT** beside **EXPORT CURRENT SETTINGS**.
- (c) A configuration file named MDVRCFG.CFG will be created on the root of the USB flash drive.

Note: If a configuration file with the same name is present, this will be overwritten.

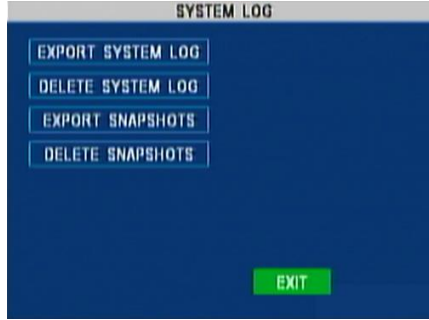
6.3.4 Importing Settings from USB

This process is used for duplicating particular settings onto several units.

- (a) Plug a USB flash drive into the front USB socket of the MDR containing a configuration file (named MDVRCFG.CFG) on the root.
- (b) Configuration files are channel dependent, so a 4 channel configuration file is not compatible with an 8 channel MDR and vice versa.
- (c) Select **IMPORT** to the right of **IMPORT THE SETTING FILE**.
- (d) This file will be loaded onto the MDR and configuration will be applied after an automatic restart.

6.4 System Log

This section explains four main functions related to system log and snapshots (see sections 4.2.2 and 4.2.8). Browse to **Settings → System → System Log** *System Log Figure 69* will appear.



System Log Figure 69

6.4.1 Exporting Log Files

- (a) Plug a USB flash drive into the front USB socket of the MDR.
- (b) Select **EXPORT SYSTEM LOG**. A folder named **userlog** will be created containing subfolders related to the vehicle ID and unit ID (see section 4.3.3).
- (c) A text file named userlog-YYYY-MM-DD-xxxxxxxxxxxx.log will be saved within the userlog folder. This file can be read using any text editor. It contains information such as log-in/out time, recording start/end, event time, GPS status and power on/off time.
- (d) For a full description of all the messages contained in the file, please, refer to section 13.4 User Log Description.

6.4.2 Delete System Log Files

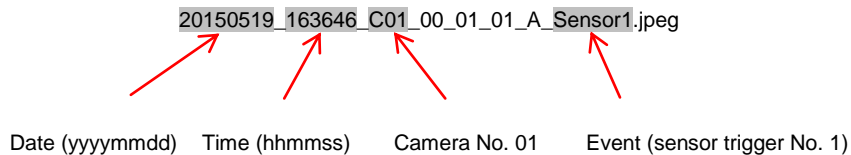
This operation will permanently delete all stored system information without any means of recovery.

6.4.3 Exporting Snapshots

- (a) Plug a USB flash drive into the front USB socket of the MDR.

Warning: Do not connect an external HDD to the front USB port. Only USB Flash drives (which contain flash memory) is supported by this port. Brigade will not be held responsible for incorrect use of this port.

- (b) Select **EXPORT SNAPSHOTS**. A folder on the root of the flash drive named **snapphoto** with subsequent sub-folders (named with the date in the format YYYY-MM-DD) will be created.
- (c) All the camera snapshots will be downloaded into their appropriate subfolders and named with a date, time and the event information as shown in *Snapshot Naming Convention Figure 70*.



Snapshot Naming Convention Figure 70

Please, refer to sections 4.2.2 and 4.2.8 for snapshot event configurations.

6.4.4 Delete Snapshots

This operation will permanently delete all the stored pictures triggered by events without any means of recovery.

7 Additional OSD Features

This section explains the usage of special alarm configurations.

7.1 Camera Alarms

Note: Blind detection is not recommended when using cameras with infrared illumination.

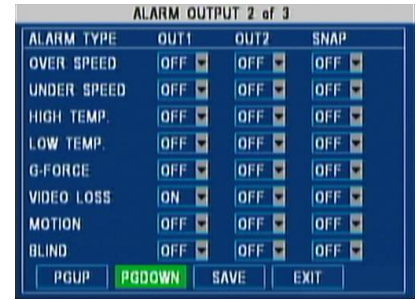
- (a) With reference to sections 4.1.1 Options, 4.2.6 Motion Detection and 4.2.2 Alarm Outputs, the screens shown in *Options 3 of 3 Figure 71*, *Camera Event Settings Figure 72* and *Alarm Output 2 of 3 Figure 73* allow users to configure video loss and blind detection behaviours.
- (b) **VIDEO LOSS** occurs due to an unexpected/unwanted disconnection or failure of a particular camera.
- (c) **BLIND DETECTION** occurs when a camera is obstructed by a large object or deliberately. These two alarms are mostly used in order to tackle acts of vandalism. It is useful to activate alarm recordings for all cameras in order to identify any possible issue.



Options 3 of 3 Figure 71



Camera Event Settings Figure 72



Alarm Output 2 of 3 Figure 73

- (d) **VIDEO LOSS** recording is active by default (Options 3 of 3 Figure 71). When this recording has to appear as an alarm, this needs to be activated in the **CAMERA** settings (Camera Event Settings Figure 72). Additionally, such an alarm can enable the output triggers and snapshots (Alarm Output 2 of 3 Figure 73).

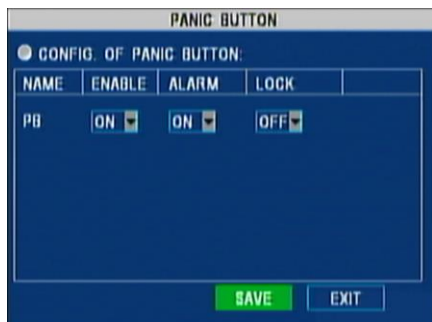
Note: By deactivating the Video Loss recording, the MDR only records channels that produce a video signal.

- (e) Blind detection can be activated and its sensitivity (**B.D. SENSITIVE** where 1 represents high sensitivity and 4 is the least sensitive) can be adjusted (Camera Event Settings Figure 72).

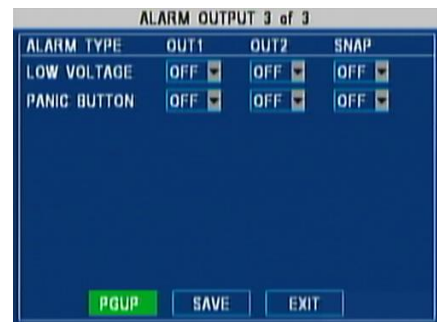
7.1.1 Panic Button

The panic button is a red button located on the Remote Status & Interface Panel (Optional).

- (a) By pressing and holding it for more than 2 seconds, an alarm can be activated as shown in Panic Button Settings Figure 74.
 (b) Browse to **Settings** → **Event** → **Panic Button** in order to disable it. Alternatively, add the **LOCK** option (see LOCKED FILE RETENTION in section 4.1.1 Options).



Panic Button Settings Figure 74



Alarm Output 3 of 3 Figure 75

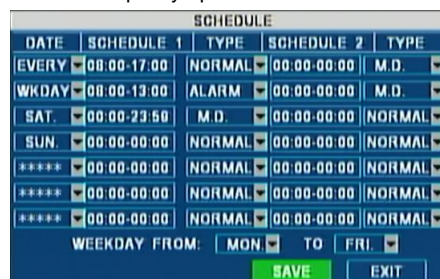
- (c) Browse to **Settings** → **Event** → **Alarm Output** as explained in section 4.2.2 to configure the output triggers and snapshots (Alarm Output 3 of 3 Figure 75).

7.2 Language

- (a) Browse to **Settings** → **Peripheral** → **Language Setting** in order to change the language from default English to one of the following options:
- Russian
 - Spanish
 - Polish
 - Portuguese
 - Turkish
- (b) Once the language has been selected press **SAVE** and then exit the OSD menu.
 (c) The device will then reboot to activate the new OSD language.

7.3 Scheduled Recording

- (a) Timer/ Ignition & Timer – Auto boot function will allow this to work, only during the hours of the set Auto boot. If the record schedule is set outside of the auto boot hours the MDR will not turn on (Only applies to Timer record mode)
 (b) Browse to **Settings** → **Record** → **Schedule** in order to specify up to 7 x 2 scheduled recording combinations:



Schedule Settings Figure 76

Note: Ensure that **ON/OFF** type is **TIMER** (or **IGNITION OR TIMER**) as explained in section 4.3.2 - **ON/OFF TYPE**. This will enable users to either select the time for the MDR boot-up and shutdown or otherwise use the **AUTO BOOT UP ON SCHEDULE** option. Also ensure that **RECORD MODE** is on **TIMER** as explained in section 4.1.1 - **RECORD MODE**.

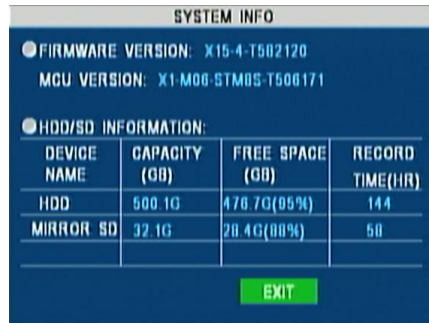
- (c) *Schedule Settings Figure 76* illustrates an example of scheduling using only 3 out of 7 options. In this case, the WEEKDAY (**WKD**) is defined as Monday to Friday.
- (d) The first row specifies that during the weekdays, normal recording is activated between 8:00 and 17:00 and uses motion detection for the rest of the time.
- (e) The second row specifies that Saturday between 8:00am and 1:00pm recording is only activated by alarms and the rest of the time by motion detection.
- (f) The third row specifies a single behaviour for the whole Sunday in which recording is activated uniquely by motion detection. See 4.2.6 Motion Detection for more information.

7.4 Information Menu

This section explains the content of the following groups of information as follows.

7.4.1 System Info

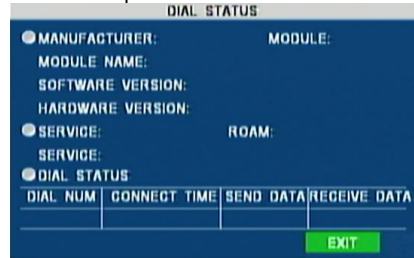
- (a) Browse to **Information** → **System** to display information about the firmware/MCU versions and the media storage.
- (b) Firmware/MCU information can also be found by pressing the **ENTER** button on the remote control.
- (c) The media storage section gives an estimation of the **remaining** recording time available. *System Information Figure 77* shows an example:



System Information Figure 77

7.4.2 Dial Status

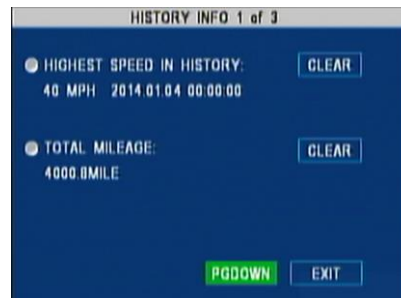
- (a) Browse to **Information** → **Dial Status** to display information about mobile network module and SIM status
- (b) *Dial Status Information Figure 78* is populated with information based on the MDR model.
- (c) This will be left blank if there is no mobile network module present.



Dial Status Information Figure 78

7.4.3 History

- (d) Browse to **Information** → **History** to display information related to speed, G-Force, Voltage and Temperature.
- (e) *History Information 1 of 3 Figure 79* illustrates the first page with information about speed and total mileage.

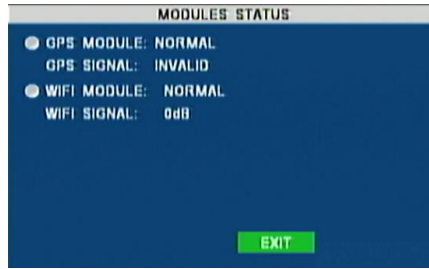


History Information 1 of 3 Figure 79

- (f) Highest speed contains the date and time of the occurrence.
- (g) The total mileage is calculated by adding the recent mileage to the vehicle mileage at the time of the MDR installation (see section 4.2.3 - **CURRENT MILEAGE**).
- (h) Use the **CLEAR** buttons to reset these values.

7.4.4 Module

- (a) Browse to **Information** → **Module** to display the GPS module status. *Module Status Figure 80* provides information about the signal reception and if it is normal or abnormal operation.
- (b) Depending on MDR model – Wi-Fi module status and signal is displayed here.



Module Status Figure 80

8 MDR-Dashboard 2.0

MDR-Dashboard 2.0 software is used for advanced local playback, analysis, clipping, GPS tracking, vehicle information and events/log display. Remote Device and Server playback is possible with 3G and/or Wi-Fi enabled MDR models. It has the following features:

- Real-time Preview (Depending on model)
- Multi Vehicle Monitoring (Depending on model)
- Playback of Server (Depending on model) and Local Video Data
- Clipping and Downloading Data
- Evidence Management (Depending on model)
- Auto Download Scheduling (Depending on model)
- Basic Data Management
- Alarm Center (Depending on model)

It allows exporting video clips in three different ways:

- **STANDARD** - proprietary format (readable only by MDR-Dashboard 2.0 and MDR-Player 2.0)
- **EXPORT** - an executable file containing an embedded version of the MDR-Player 2.0
- **AVI** – industry generic video format (without metadata)

Aside from exporting features and event/log display, the MDR-Dashboard 2.0 can read directly from the MCU (Mobile Caddy Unit) or the internal SD card. These features are not available on the MDR-Player 2.0.

8.1 PC System Requirements

The system requires a PC with a USB 2.0 Type-A connector, which will connect the MCU to the PC. A USB cable with USB standard type A plug to standard B plug is provided with the MDR. The MDR-Dashboard 2.0 is compatible with Microsoft™ Windows™ 7, 8.x (32-bit or 64-bit version) and 10 operating systems.

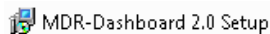
Note: In order to use the maps feature, an internet connection is required.

MDR-Dashboard 2.0 minimum requirements:

COMPONENT	MINIMUM REQUIREMENTS
CPU	INTEL i3-3220 (3.30GHz) and above
Memory	4GB
Operating System	Windows 7 SP1, Windows 8 and Windows 10
Web browser	Internet Explorer 10
Graphics Card	Independent graphics card
Software	Flash player (up to date)
Resolution	1280x760 (minimum)
RAM	2GB

8.2 Installing MDR-Dashboard 2.0

- (a) This operation is performed on the client PC. Double-click the installation file shown in *MDR-Dashboard 2.0 icon Figure 81*.
- (b) There may be a security warning pop-up which may be ignored. The software is verified to be virus-free. Click **RUN**.

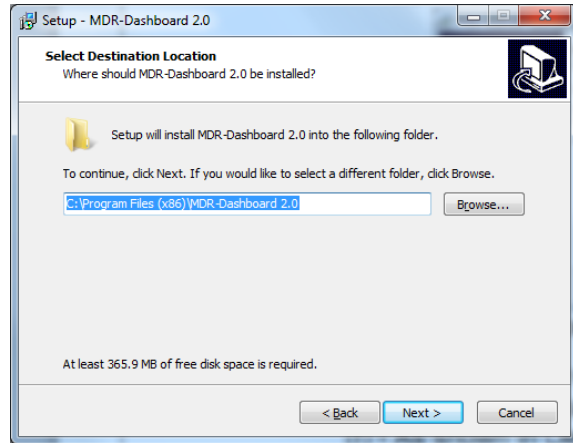


MDR-Dashboard 2.0 icon Figure 81

- (c) The setup wizard window will then be displayed. Click **NEXT** to begin the installation.
- (d) Users can configure the destination location (if there is not enough free disk space) which is shown in *MDR-Dashboard 2.0 Location Figure 83*. It is **NOT** recommended to change the default location.

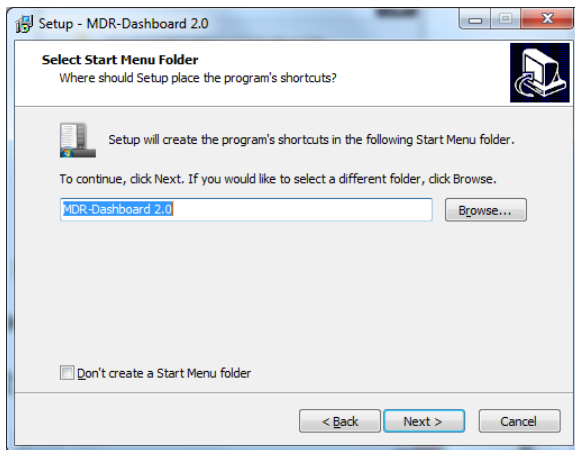


MDR-Dashboard 2.0 Setup Figure 82

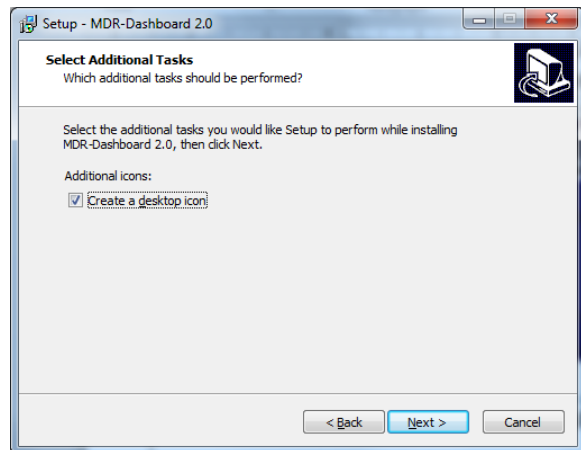


MDR-Dashboard 2.0 Location Figure 83

- (e) Users can then choose if a start menu folder should be created as shown in *Start Menu MDR-Dashboard 2.0 Figure 84*.
- (f) Referring to *Desktop Icon MDR-Dashboard 2.0 Figure 85*, users can choose if a desktop icon is created.

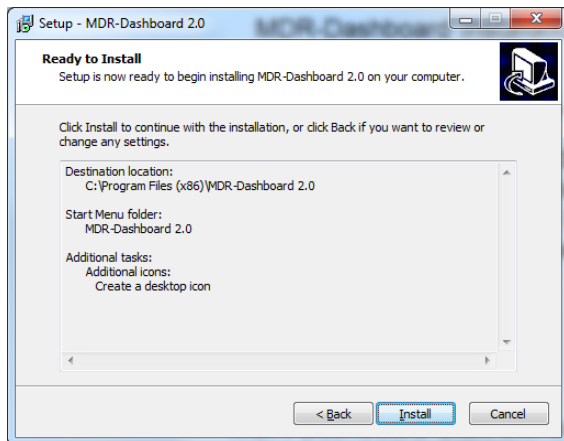


Start Menu MDR-Dashboard 2.0 Figure 84

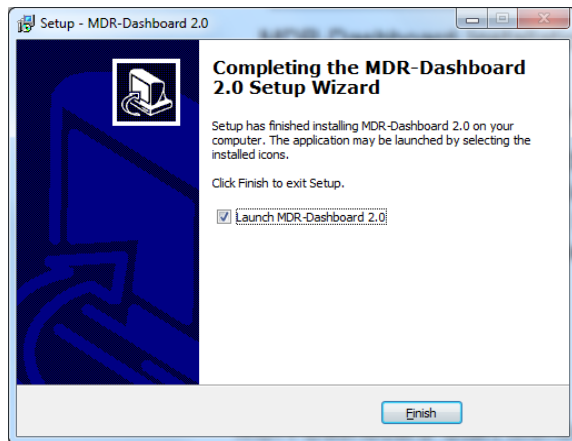


Desktop Icon MDR-Dashboard 2.0 Figure 85

- (g) Users are now prompted to click **NEXT** to begin the installation. This is indicated in *MDR-Dashboard 2.0 Installation Figure 86*.
- (h) In *MDR-Dashboard 2.0 Launch Step Figure 87* depicts the final step, users may choose to launch the software. Tick the box and click **FINISH**.



MDR-Dashboard 2.0 Installation Figure 86



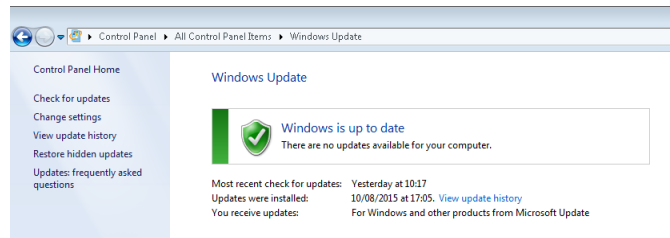
MDR-Dashboard 2.0 Launch Step Figure 87

8.3 Connecting the MCU to the PC

8.3.1 Pre-Connection Procedure (Preferred)

Users may follow the below procedure if an internet connection is present.

- a) Run **Windows Update** in order to have the latest driver database available.
- (i) PC must be up to date with **Windows Update**. Browse to **Control Panel** and then click on **Windows Update** to confirm this. See *Windows Update Figure 88*.

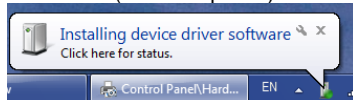


Windows Update Figure 88

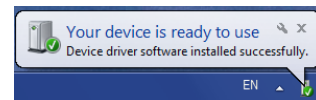
8.3.2 MCU Connection Procedure (Required)

Users must follow the procedure listed below in order to correctly mount the MCU to their PC.

- Connect the USB-B connector to the MCU USB port.
- Connect the USB-A (data and power) connector to a USB port on the PC. *Installing Device Driver Figure 89* will be displayed.



Installing Device Driver Figure 89



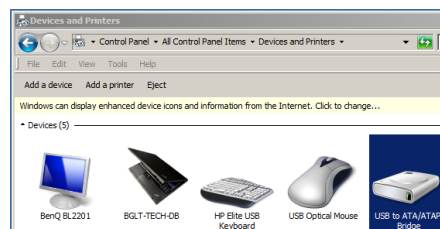
Device Drivers Installed Figure 90

- Once *Device Drivers Installed Figure 90* is shown the two drivers and device have installed successfully.
- Users may now open MDR-Dashboard 2.0 and the HDD will now appear.

Warning: Premature removal of the MCU USB-A cable from the PC (during driver installation process) will cause this process to fail. This will cause the HDD to not appear in the MDR-Dashboard 2.0.

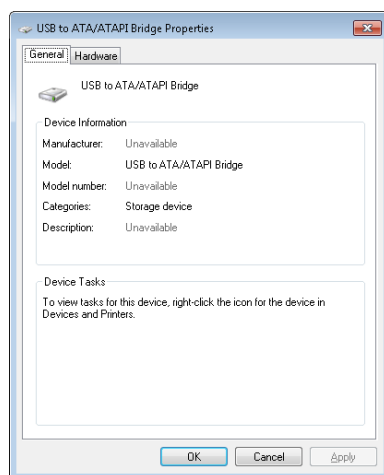
8.3.3 Connection Confirmation

- Open **Control Panel**.
- Browse to **Device and Printers**, the device **USB to ATA/ATAPI Bridge** must be displayed as shown in *Devices and Printers Figure 91* as below.

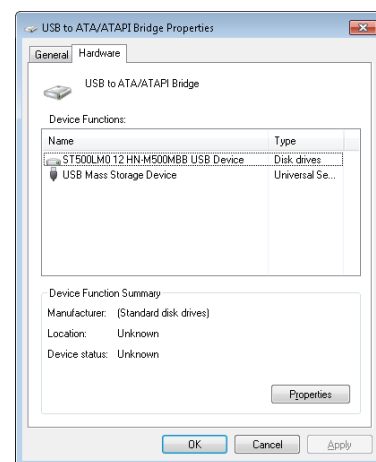


Devices and Printers Figure 91

- View the drivers associated with this device, right click the above **USB to ATA/ATAPI Bridge** icon and browse to **Properties**.
- General Properties Figure 92* will be presented which shows **General** and **Hardware information**.
- Two drivers must be listed under **Hardware information**, one that represents the USB interface and one for the HDD. See *Hardware Properties Figure 93*.



General Properties Figure 92



Hardware Properties Figure 93

Note: If failure occurs a manual removal of the drivers and a re-start of the PC is required. Please contact Brigade if support is needed.

8.4 Loading from HDD/SD

- Right-click the MDR-Dashboard 2.0 shortcut and **RUN AS ADMINISTRATOR**.
- Users open MDR-Dashboard 2.0 (run as administrator) and then choose **LOCAL** as shown in *Local Login Figure 94*.
- MDR SERVER** type is used for wireless MDR models (require MDR Server installation).
- Default username: **admin** and default password: **LEAVE BLANK**.
- Once users have filled in the username click **OK**. See *Local Login Details Figure 95*.



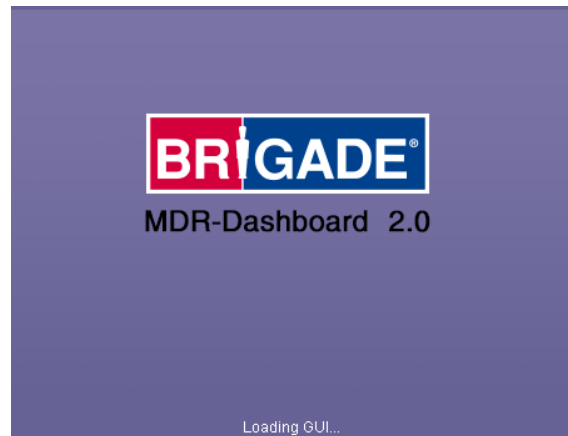
Local Login Figure 94



Local Login Details Figure 95

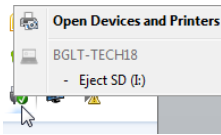
- (f) The software will display a loading screen as shown in *Loading Screen Figure 96*.
- (g) This process allows users to load the content of either a connected HDD Caddy (using the USB cable) or a mirror recording from the internal/external SD Card.
- (h) Reading these media storage devices may be slow depending on the amount of data recorded and the speed of the interface.

Note: HDD are hot pluggable, so the HDD can be removed and reconnected. SD cards are **not** hot pluggable. In order to safely remove the SD card, click on the Safe Removal icon at the bottom right of the Windows™ bar (see *Eject SD Figure 97* and *Cancel Format Disk Figure 98*).

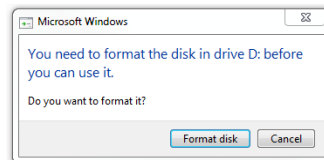


Loading Screen Figure 96


Warning: After inserting SD cards into a SD card reader, Windows™ may request to format them as shown below (right). Click Cancel.



Eject SD Figure 97



Cancel Format Disk Figure 98

- (i) Users will connect an MCU which contains the HDD to the local PC. Please use the supplied USB-B cable. If the MCU does not power on please connect both USB-B cables. If the MCU still does not show, try switching to another USB port.
- (j) Once the MCU has powered up, click the refresh icon , the vehicle will appear as green to indicate it is available for browsing.
- (k) The number of connected MCUs connected the PC will be displayed under **HDD COUNT**. See *HDD Count Figure 99*.



HDD Count Figure 99

8.5 MDR-Dashboard 2.0 Local Mode



MDR-Dashboard 2.0 User Interface Figure 100

The MDR-Dashboard 2.0 user interface is sub-divided into several numbered areas as illustrated in MDR-Dashboard 2.0 User Interface Figure 100:

1. Data Source Access (Data Source Figure 120)
2. Graphs Panel
3. Controls Panel
4. Media Playback
5. Map
6. Frame Information

All of the above areas are explained in greater detail in the following sections. During playback, users can zoom in/out on the timeline by either using the +/- buttons or the mouse scroll wheel. The vertical blue line can be positioned to the desired time by either dragging it or by clicking on the timeline directly.





Frame Information Figure 101

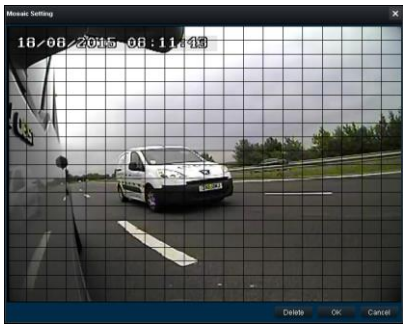
8.5.1 Channel Info

Information about resolution, frame rate and streaming bit rate are shown in all of the 4 or 8 quadrants – only in full screen view (area 4). On the top left of each image, users can see the MDR-Dashboard channel number followed by the company number, vehicle number and MDR channel number (in the below example) camera 1 shows: “4 3-3 - 4”.



- (a) Access full screen mode of a single channel by double-clicking the desired channel. Exit a full screen view by double-clicking again.
- (b) Audio playback is limited to one channel at a time, single-clicking a channel will access the audio feed – a green outer box visually confirms the current audio feed being accessed.

- (c) Each camera channel has two additional features, **BLUR**  and **ZOOM** .
- (d) Users can use blur to create a mosaic setting of an area which will be blurred throughout video playback. See *Creating Mosaic for Blur Figure 102*, *Setting the Blur Area Figure 103* and *Blur Activated Figure 104*.
- (e) **BLUR** can be applied to a channel for a clipping of a video segment.



Creating Mosaic for Blur Figure 102



Setting the Blur Area Figure 103



Blur Activated Figure 104



- (f) **ZOOM** is used to create a magnified view of a selected area of a camera channel. Click the magnifying glass and then choose the desired box area. This is now the only area that will be visible during playback. To exit this view, double-click the camera channel. See *Choosing Zoom Area Figure 105* and *Zoom area Figure 106*.
- (g) **ZOOM** cannot be applied to a clipping – this feature is for viewing a critical area more closely.



Choosing Zoom Area Figure 105



Zoom area Figure 106




- (h)   is used to **ZOOM** in or out of the time scale. Maximum **ZOOM** in is 5 seconds and maximum **ZOOM** out is 24 hours.

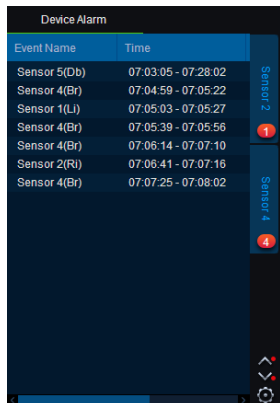
8.5.2 Events and Graphs

- (a) Information about events can be viewed by clicking on the **EVENT** button as shown in *Extended View Settings Figure 107*. This will provide a list of all the events.

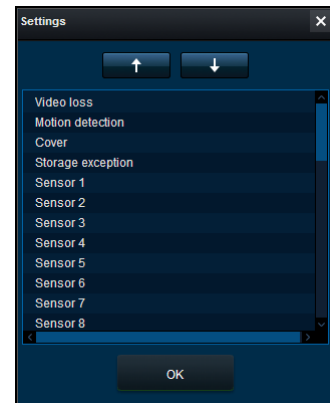


Extended View Settings Figure 107

- (b) Events can also be filtered by clicking on each tab shown in *Event Information Figure 108*. Users may use the arrows to access various tab options. Double-clicking a log in the event list will jump to that point in playback mode.
- (c) OSD settings – the sensor 2 character names are displayed in the event list with brackets. See *Event Information Figure 108*.
- (d) Events can also be ordered based on a user-specific hierarchy. Click on the  (*Event Information Figure 108*) icon to access and change the order. Use the   shown in *Event Hierarchy Figure 109*.



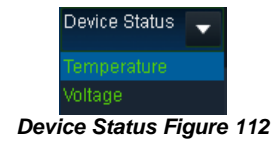
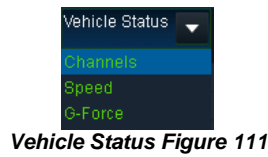
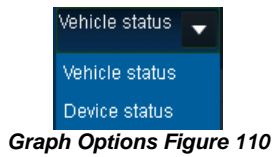
Event Information Figure 108



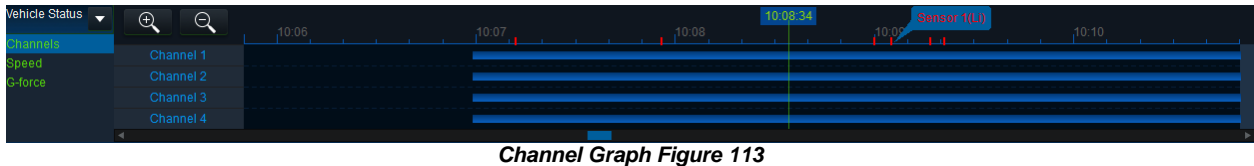
Event Hierarchy Figure 109

- (e) See *Event Information Figure 108*. Event information consists of event names, event times and event descriptions (use horizontal scrollbar to view).

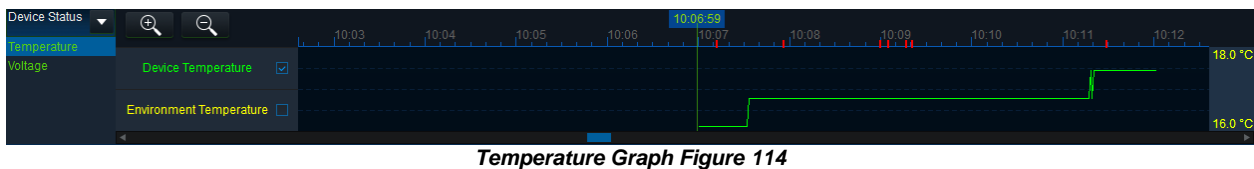
- (f) Users can access vehicle information such as
 - Recorded channel data graph based on time
 - Speed graph based on time
 - G-force data graph based on time
- (g) Double-clicking on a graphical point will jump to that time in playback.
- (h) Click the drop down menu shown in *Graph Options Figure 110* and choose **VEHICLE STATUS**.
- (i) Once the vehicle status sub-menu has been opened as shown in *Vehicle Status Figure 111*, click on the desired option to view the graphical data.



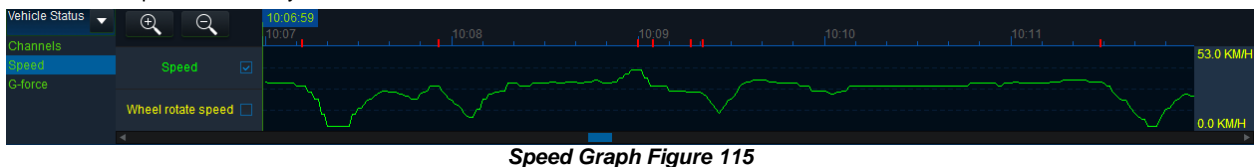
- (j) Events are shown clearly using red vertical markers on all graphs. Hovering over these markers provides users with additional information; see *Channel Graph Figure 113* for an example.
- (k) Blue video channel bars represent normal recordings. Orange video channel bars represent alarm recordings.



- (l) Users can access device information such as:
 - Device temperature graph based on time – using the built-in temperature sensor
 - Environment graph based on time – not currently supported
 - Voltage graph based on time
- (m) Click the drop down menu shown in *Graph Options Figure 110* and choose **DEVICE STATUS**.
- (n) Once the device status sub-menu has been opened as shown in *Device Status Figure 112*, click on the desired option to view the graphical data.



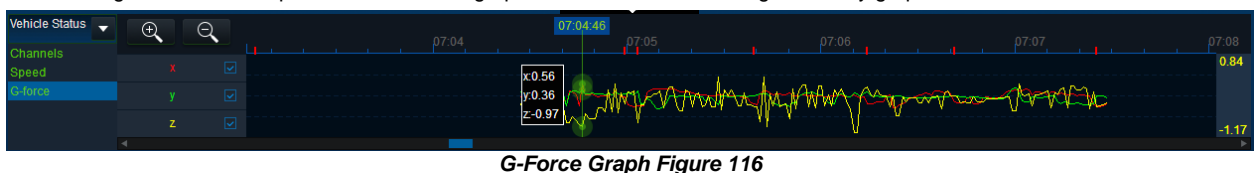
- (o) Wheel rotation speed is currently unused.



- (p) G-Force is displayed as a triple graph with red, green and yellow lines where each colour represents the X, Y and Z axes respectively.

- (q) These tickboxes can be ticked or unticked depending on the desired graphical information.

- (r) The highest and lowest peaks of the current graph area are shown to the right of every graph.



8.5.3 Frame Information

The Frame Info panel (Frame Information Figure 117) provides information about firmware/MCU version, Register Info, vehicle tracking and vehicle information (temperature and voltage).

FRAME INFORMATION consists of:

- Firmware version
- MCU version
- Company name
- Vehicle number
- G-force
- GPS
- Speed
- Satellite
- Satellite precision

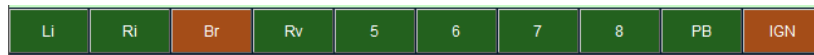
- Voltage
- Temperature



Frame Information Figure 117

8.5.4 Sensor Status

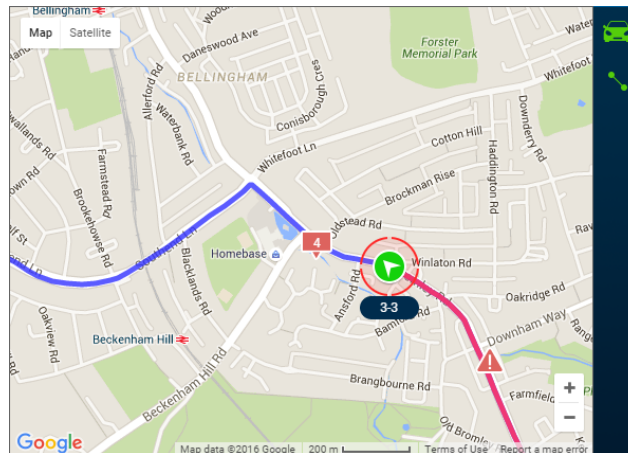
- The 2-character names are set in the OSD menu where users name each Sensor.
- MDR-Dashboard 2.0 displays the status of the sensor triggers at the bottom of the Frame Info (area 6). *Sensor Status Figure 118* shows the ignition (IGN) and the sensor input named Br (Brake) triggered.
- PB (Panic button) and IGN (Ignition) are not configurable.





Sensor Status Figure 118

8.5.5 Map Tracking


The map (area 5) refreshes the position of the vehicle continuously during playback and displays the vehicle number (in this example named to 3-3 – see also section 4.3.3). Zooming in and out on the map can be done using the +/- buttons.



Map Tracking Figure 119

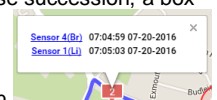
- There are two map view settings that can be turned on/off:
 - Lock map to vehicle automatically
 - Show Line/Hide Line
- Click the Lock Map button  to ensure that the vehicle is always shown in the center of the map. If this is turned off then the map can move freely regardless of the vehicle position.
- Click the Line button  which will turn the vehicle route track line on or off depending on this setting. It is advised to have this turned on. The red trace indicates the route that has been travelled while the blue represents the route the vehicle will travel. Google Maps Satellite View is also supported.

Note: As an alternative, MS Bing maps can be chosen. Changing maps requires restarting the MDR-Player 2.0 which will be requested once the setting has been changed.

- A hazard symbol  on the map will show points where an alarm was triggered. If there are multiple alarms in close succession, a box

indicating the number of alarms will be shown on the map . Click on these icons to access additional information about the alarm.

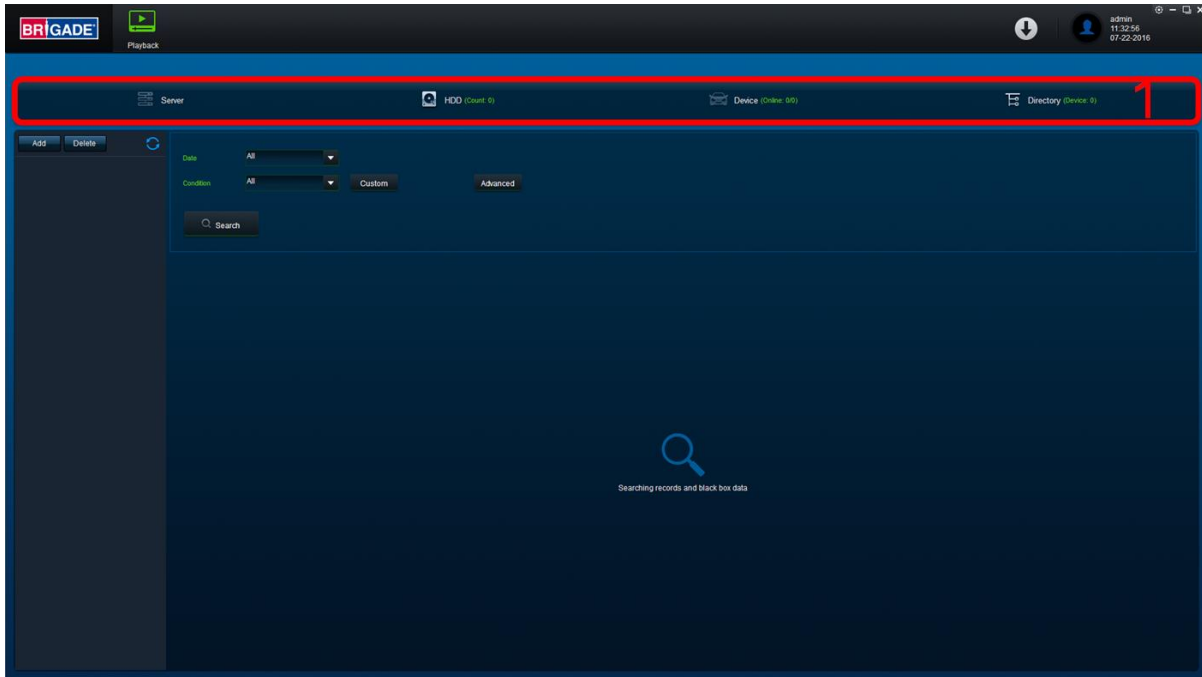
- Video playback will move to the event point if this is clicked on.



8.6 Loading from a USB flash drive or Folder

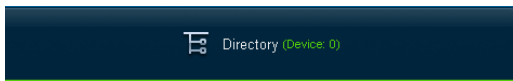
This procedure applies to recordings previously downloaded from the MDR and saved onto a USB flash drive or recordings manually saved directly onto a PC.

(d) In order to read exported files click on the Directory tab found on the Data Source Access (area 1). See *Data Source Figure 120*.

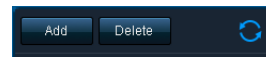


Data Source Figure 120

(e) Users click on the **DIRECTORY** tab as shown in *Directory Tab Figure 121*.



Directory Tab Figure 121

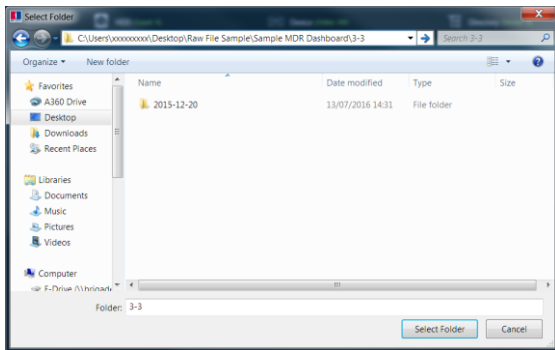


Directory Add Figure 122

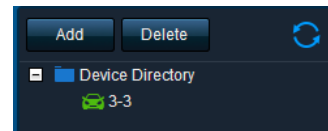
(f) Click the **ADD** button as shown in *Directory Add Figure 122*. Browse to the relevant folder and click **SELECT FOLDER**.

(g) This brings up a Windows™ Explorer dialogue box (*Windows Explorer Folder Figure 123*) which allows users to select the folder that contains the recordings. Select the MDR Vehicle name, in this example 3-3.


(h) Once the folder has been successfully loaded, it will appear as shown in *Device Directory Figure 124*.



Windows Explorer Folder Figure 123



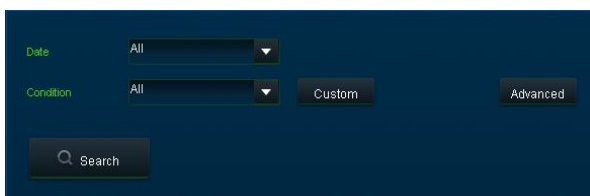
Device Directory Figure 124

(i) If there was a directory specified previously, click the refresh icon  to get the directory to appear. This will be a green icon to indicate it is available for browsing.

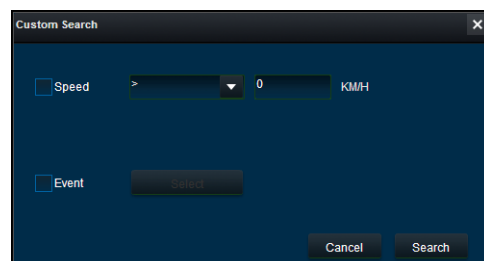
(j) Double-click the vehicle icon. This will display **ALL** calendar events. A typical example of a calendar is shown in *HDD Calendar Figure 128*.

(k) The directory will now appear in the left pane as shown in *Device Directory Figure 124*.

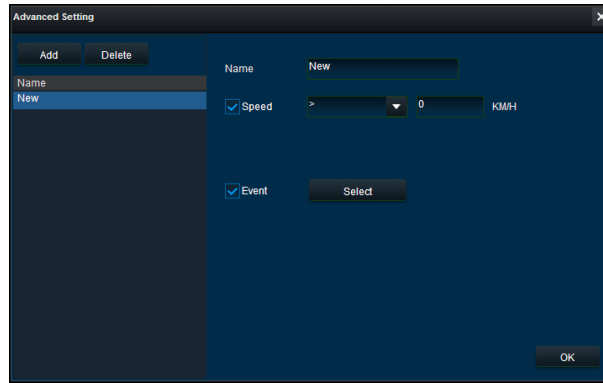
(l) Multiple directories can be specified. Directories may be searched. See *Directory Search Figure 125*. Custom and Advanced searches can be configured. See *Windows Explorer Folder Figure 123* and *Advanced Search Settings Figure 127*.



Directory Search Figure 125




Custom Search Figure 126



Advanced Search Settings Figure 127

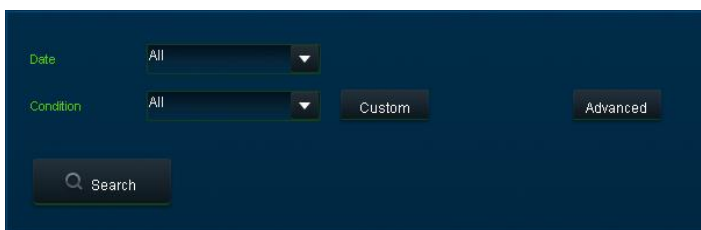
8.7 Reading Data

- (a) Double-click the vehicle icon . This will display ALL calendar events.
- (b) Each colour represents:
 - Green dates represent normal recordings
 - Orange dates represent alarm recordings
 - Red dots represent blackbox data
 - Blue outline represents the current date (today's date)
- (c) A typical example of a calendar is shown in HDD Calendar Figure 128.



HDD Calendar Figure 128

- (d) In order to refine the data displayed, users should setup the search criteria. Custom and Advanced searches can be created. *HDD Search Figure 129.*
- (e) Ensure that the **DOWNLOAD BLACKBOX** is always ticked. See *Blackbox Setting Figure 130.* This will ensure that all metadata (graphical) is shown with playback video.

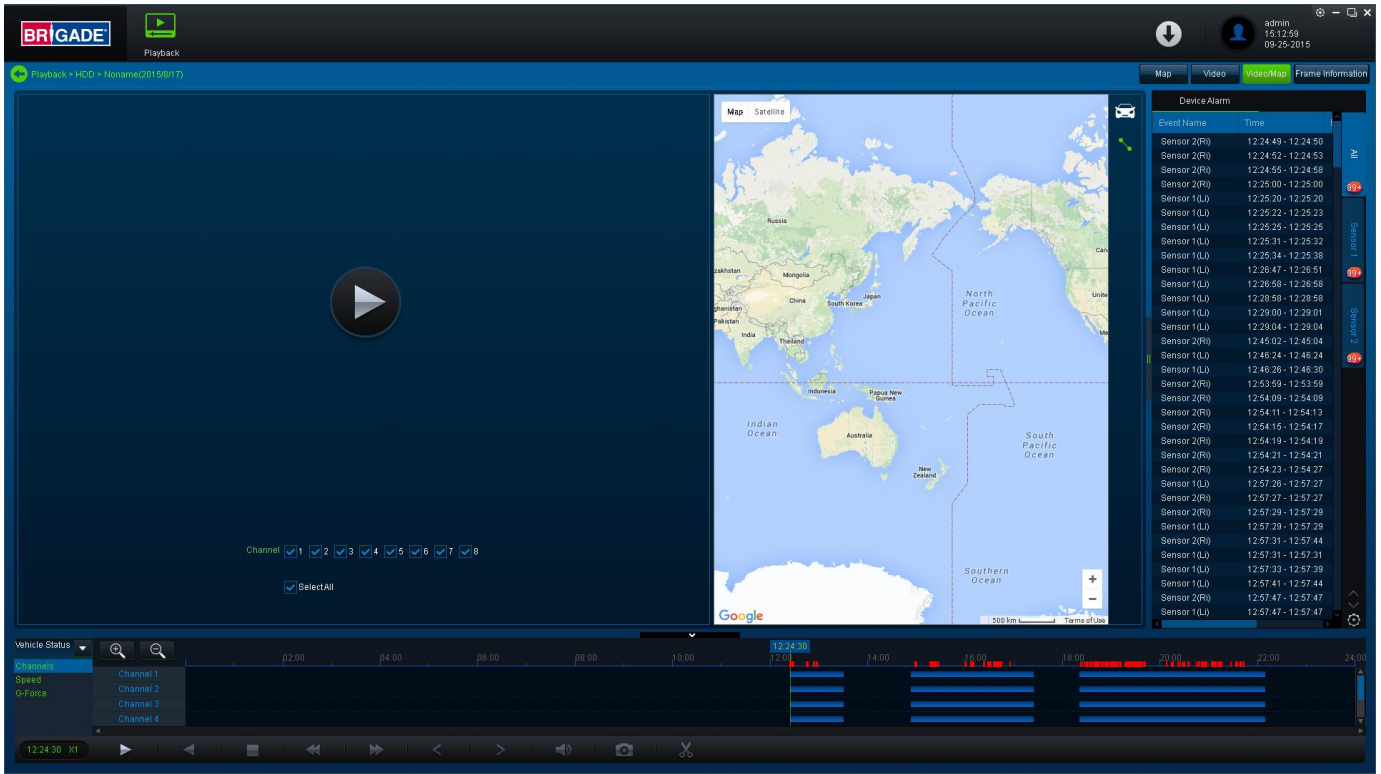


HDD Search Figure 129




Blackbox Setting Figure 130

- (f) Users double-click on the relevant calendar date. This will then display the pre-playback screen. See *Pre-playback Figure 131.* Users can choose which channels to view during playback.



Pre-playback Figure 131

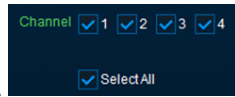
- (g) Users can access different view settings such as, **MAP**, **VIDEO** and **VIDEO/MAP**. See View Options Figure 132.
- (h) Frame information and Event information can also be accessed from this panel. To return to the calendar view from the current playback, click the back arrow . See Return to Calendar Figure 133.




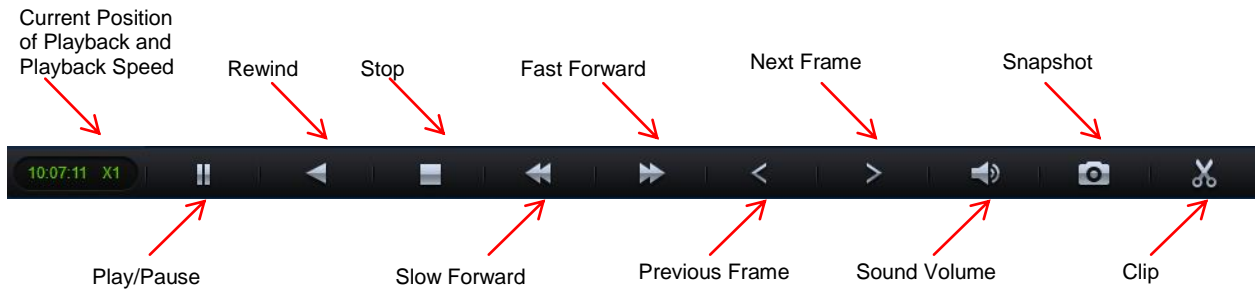
View Options Figure 132



Return to Calendar Figure 133

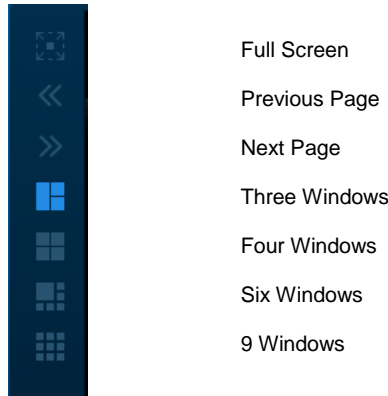


- (i) Choose which channels to playback.
- (j) Click the Play button  in order to display the data.



MDR-Dashboard 2.0 Controls Panel Figure 134

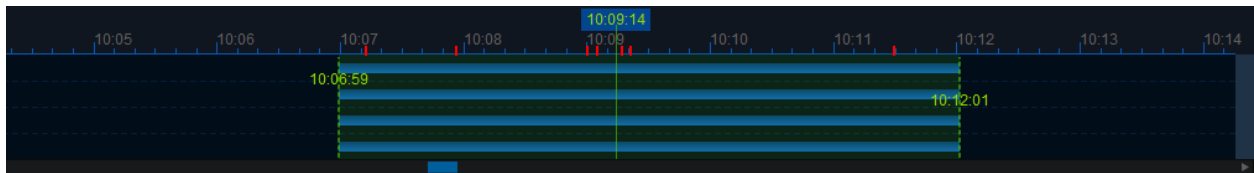
- (k) **Fast Forward** options (1x, 2x, 4x, 8x, 16x, 32x). Maximum **Slow Forward** option is x1/32.
- (l) Double-clicking an individual channel to make it full screen. There are other video viewing options as shown in *Video View Options Figure 135*. This is dependent on model (4 channel or 8 channel).



Video View Options Figure 135

8.8 Exporting Videos

- a) Click on the **CLIP** button . Only accessible during while video is being played or paused.
- b) Green clip markers appear (broken vertical lines). See *Clipping a Video Figure 136*.
- c) Select the start and end time for the clip by dragging and dropping to the desired time, users may also make fine adjustments to the times by typing. See *Clip Settings Figure 137*.
- d) Once satisfied click on the **OK** button



Clipping a Video Figure 136

The following window will appear to choose the channels, clipping time (when unhappy with the markers) and the kind of exporting function. There are three types of exporting:

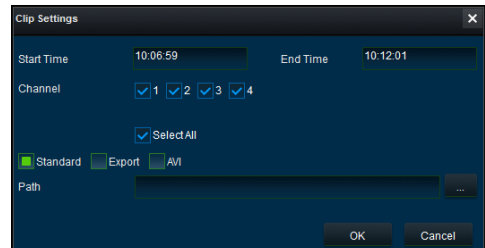
- Standard
- Export
- AVI

The **STANDARD** option cuts the clip and creates a folder structure containing the video files in original proprietary format (H264) onto a local storage device (e.g. HDD).

Note: Users are not allowed to use the same location as the original folder. Once clipped, the files will be found in a folder named with the following format:
 \Company_Name-Vehicle_Number\YYYY-MM-DD\record

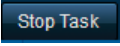
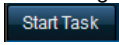
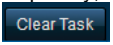
The **EXPORT** option allows users to export clips into a single .exe file with an embedded MDR-Player 2.0. This option is the recommended solution as it contains metadata and the Clip. It **MUST** be password protected and played without the need of any additional player software. If a password is not created, the file will not be accessible.

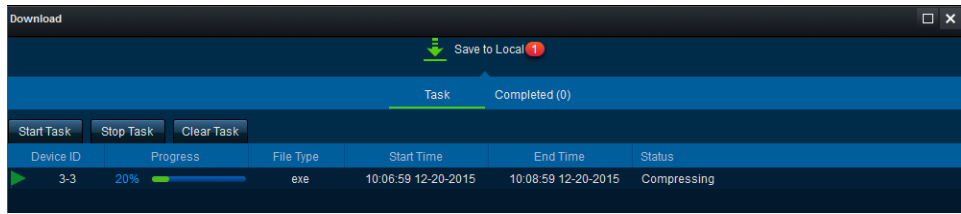
The **AVI** option creates .AVI files playable by common players such as Windows Media Player (WMP™) and Video Lan Client (VLC). The advantages of this solution are the portability of the format. The disadvantage is the lack of protection and missing metadata. These files can be played and edited by anyone. The only information contained in the video image is selected by the OSD options (see section 4.1.2 - OSD Overlay).



Clip Settings Figure 137

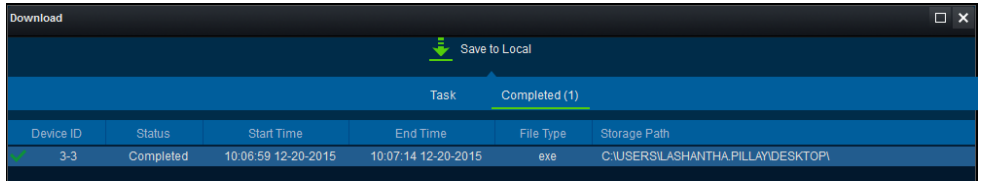
(f) Users may monitor the progress of current/completed download tasks under the downloads area. Click the  button.

(g) See *Current Download Tasks Figure 138*. Task priority is a first come first serve basis. If another task has a higher priority, use  to stop a task and the  to start the priority task. If an error is made, tasks made be deleted using the .



Current Download Tasks Figure 138

(h) Completed tasks automatically move to the Completed tab, see *Completed Download Tasks Figure 139*.
 (i) Right-click a completed task to access a sub-menu as shown in *Completed Sub-menu Figure 140*.




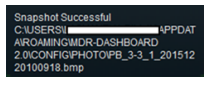
Completed Download Tasks Figure 139



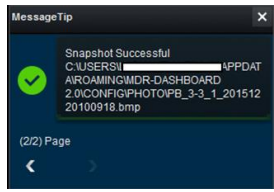
Completed Sub-menu Figure 140

8.9 Saving Snapshots

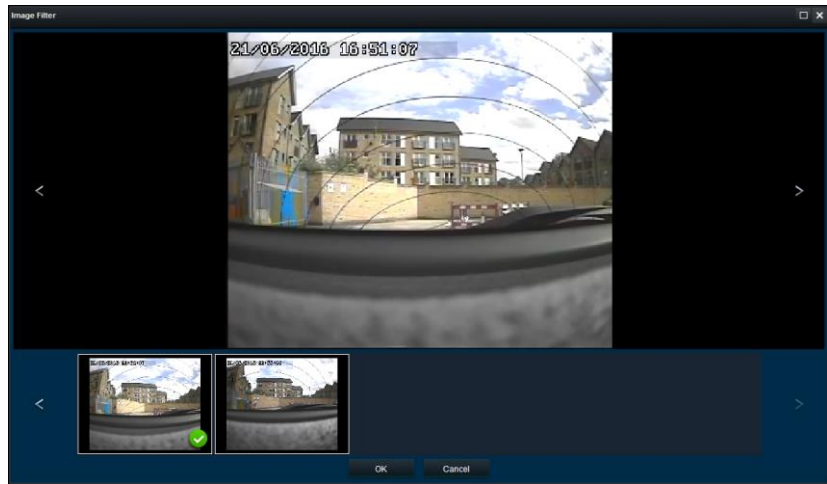
(a) Click the desired channel; this will be highlighted by a green outline.
 (b) Click on the Snapshot button  in the Controls Panel.
 (c) A pop-up window will be displayed on the bottom right corner of the desktop (next to the time/calendar) The snapshot location is also shown here (See *Snapshot pop-up Figure 141*).



(d) Click on the Snapshot Successful information  to access the **IMAGE FILTER**, this shows all historic locally stored snapshots. See *Snapshot Image Filter Figure 142*.



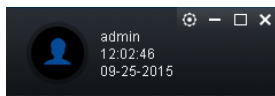
Snapshot pop-up Figure 141



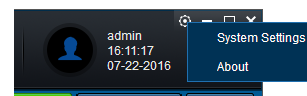
Snapshot Image Filter Figure 142

8.10 User and System settings



(a) The current logged in username, date (Client PC) and time (Client PC) is displayed. See *User and System Area Figure 143*.

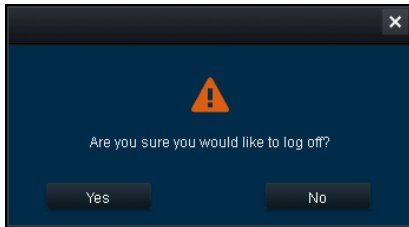


User and System Area Figure 143

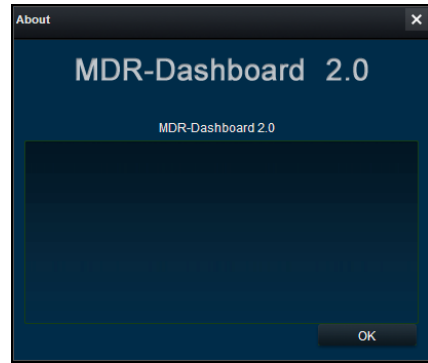


MDR-Dashboard 2.0 Settings Menu Figure 144

(b) This area is used to logout. This is achieved by clicking on the silhouette icon . This brings up a confirmation window for logging out. Click **YES** or **NO** and thereafter the MDR-Dashboard 2.0 login screen will be displayed. See *Logout Screen Figure 145*.
 (c) Click on the gear icon  to display a submenu containing **SYSTEM SETTINGS** and **ABOUT** options. See *MDR-Dashboard 2.0 Settings Menu Figure 144*.
 (d) The **ABOUT** option will display the window shown in *About Figure 146*. This will show the current MDR-Dashboard 2.0 version.

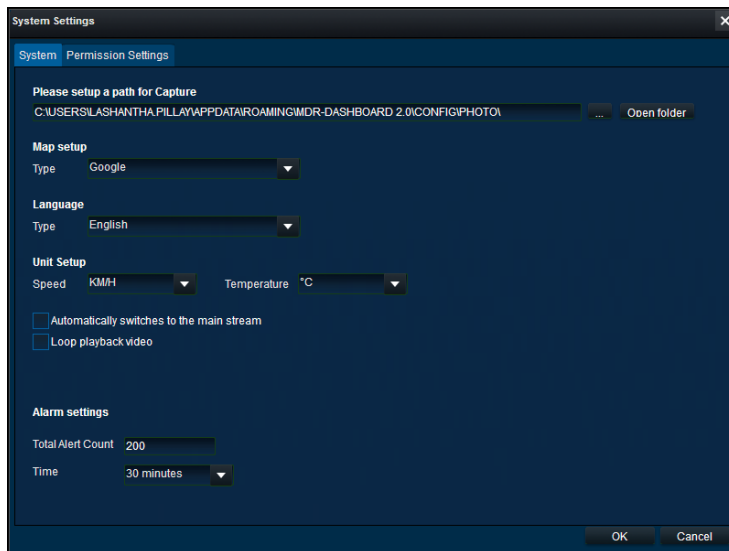


Logout Screen Figure 145



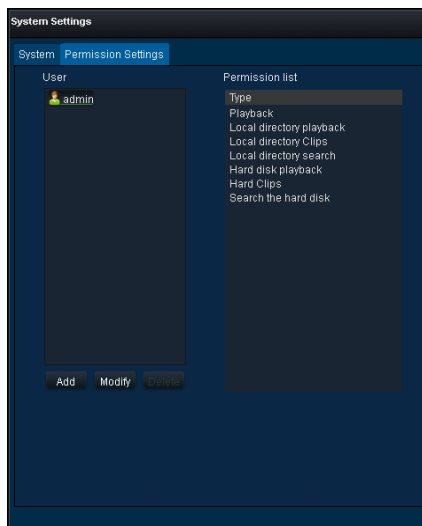
About Figure 146

- (e) Refer to the **SYSTEM** window in *System Settings Figure 147*. This area is used to configure the following:
- Path for Snapshots
 - Map Type
 - Language – English or Chinese
 - Speed Unit
 - Temperature Unit
 - Automatically switches to the main stream – Unused
 - Loop Playback Video – this will play the entire selected video on repeat. This feature can be used for HDD or directory playback
 - Alarm Settings Count – shows the historical alarm and events in the alarm log area. The default amount is 200.
 - Alarm Settings Time – shows the alarm and events for the past time range setting in the alarm log area. The default amount is 30 minutes.

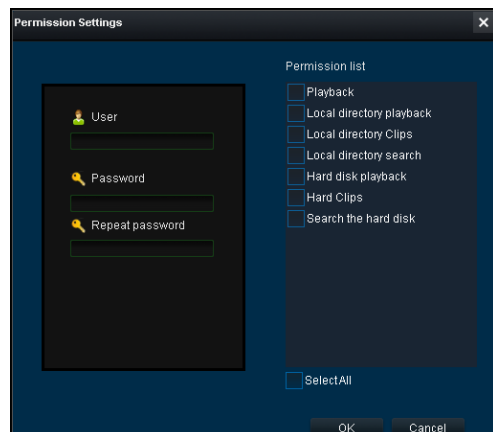


System Settings Figure 147

- (f) System Settings is comprised of 2 windows – **System** and **Permission** Settings. System Settings are shown in *System Settings Figure 147*.
 (g) See the **PERMISSION SETTINGS** window shown in *Permission Settings Figure 148*. This area is used to setup local user logins.
 (h) Only the **ADMIN** account can create new local user accounts.
 (i) Any local user accounts are for users that will login using the **SAME PC** but require different levels of access.
 (j) These accounts **CANNOT** be assigned passwords. This is also where the permissions for each local user are set. Passwords do not work.



Permission Settings Figure 148



Adding a Local User Figure 149

9 MDR-Player 2.0

MDR-Player 2.0 is similar to MDR-Dashboard 2.0 visually and in operation. MDR-Player 2.0 is used mainly to playback executable video files (.exe). In order to understand the key feature differences between the software, please see the Table below:

MDR-Dashboard 2.0 vs MDR-Player 2.0

MDR-DASHBOARD 2.0	MDR-PLAYER 2.0
Installation Required	Direct Executable File
Playback Sources – Server HDD, Local HDD, Local SD Evidence, Remote Device and Directory Playback (Clippings)	Playback Sources – Exported files (password protected .exe) and Directory Playback (Clippings)
Live Mode, Playback Mode Evidence Mode	Playback Mode
View, Clip and Export Recordings	View Recordings
Choice of Snapshot	Individual Snapshot
View Events and Logs	No option to view events and logs
Channel Blur and Zoom	No Channel Blur and Zoom

9.1 PC System Requirements

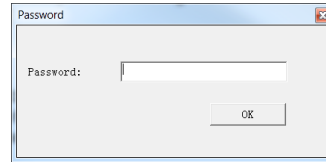
The system is compatible with a PC running Microsoft Windows™ 7, 8.x (32-bit or 64-bit version) and 10 operating systems.

9.2 Exported MDR-Player 2.0

The embedded MDR-Player 2.0 is a single executable file that can be password protected (user choice) which is generated by the MDR-Dashboard 2.0. The file contains an exported clip with the MDR-Player 2.0. By double-clicking on the .exe file, the MDR-Player 2.0 is launched and automatically displays the recordings with metadata. See the images below for the appearance of the exported icon and the password prompt window.



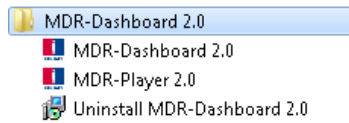
Exported MDR Icon Figure 150



Password Prompt Figure 151

9.3 Setting up MDR-Player 2.0

MDR-Player 2.0 does not require any installation. If you have already installed MDR Dashboard 2.0, MDR-Player 2.0 can be accessed in the start-up menu. See MDR-Player 2.0 Icon Figure 152. Double click on the Brigade logo named MDR-Player 2.0 to start the program.



MDR-Player 2.0 Icon Figure 152

9.4 Basic Operations

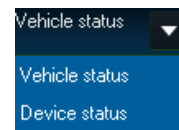
MDR-Player 2.0 allows three ways of loading the data:

- From a clip with embedded MDR-Player 2.0 (as explained in section 9.2)
- Opening a file

Users may access the following information using the dropdown menu. See *Vehicle Status*

Figure 153:

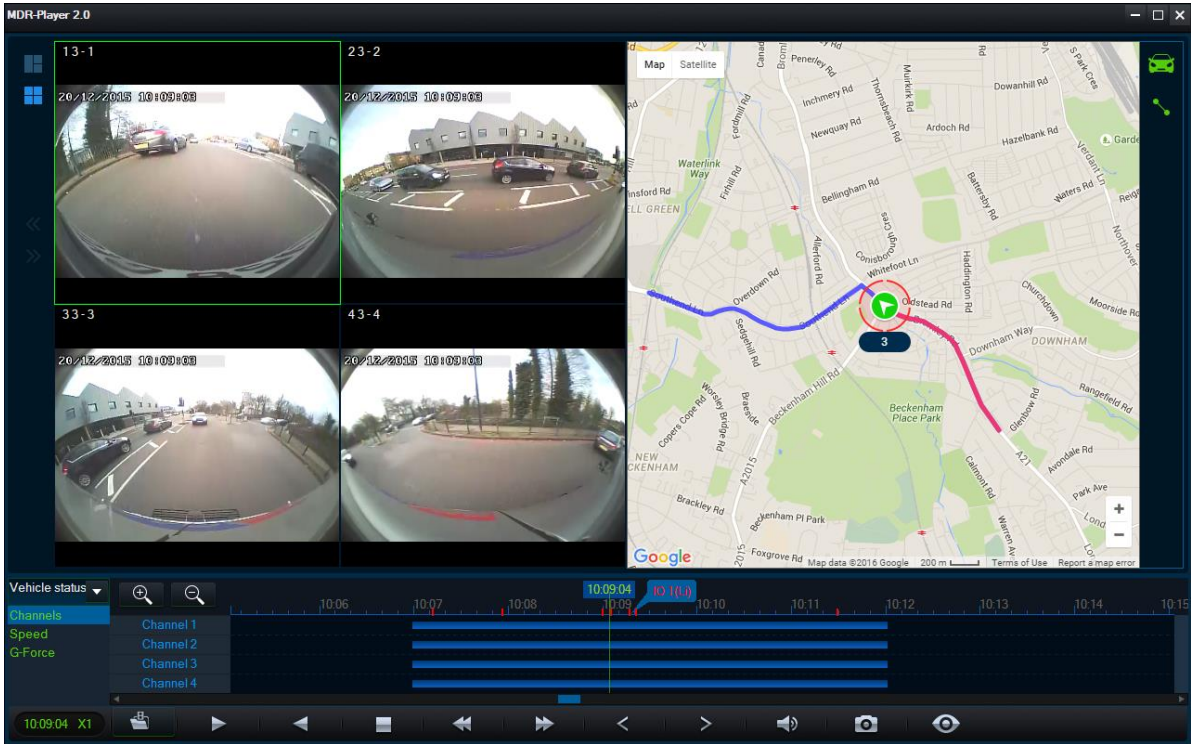
- Channel
- Speed
- G-Force
- Temperature
- Voltage



Vehicle Status Figure 153

The following interface will appear as shown below. *MDR-Player 2.0 Figure 154* illustrates a multiple camera view, a timeline with control buttons and a Google Maps view.

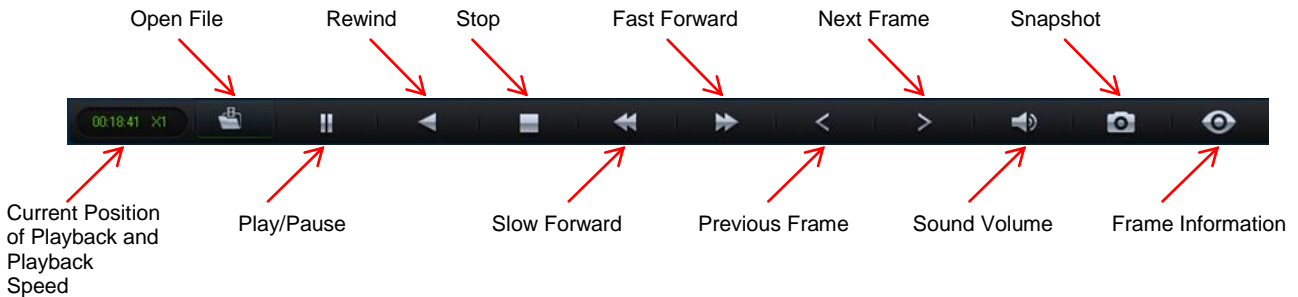
Note: In order to use the maps feature, an internet connection is required.




MDR-Player 2.0 Figure 154

The toolbar (Controls Panel Figure 154) has the following options:

- Open File
- Pause
- Rewind
- Stop
- Slow Forward (x1/2 or x1/4)
- Fast Forward (x2 or x4)
- Previous Frame
- Next Frame
- Sound
- Snapshot – takes a screenshot of the selected channel which are stored in C:\Users\- Frame Information

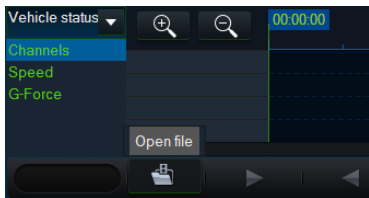


MDR-Player 2.0 Controls Panel Figure 155

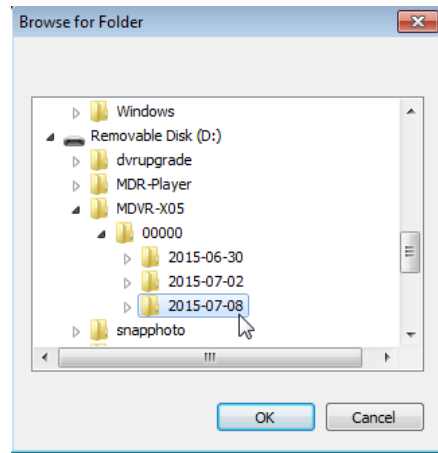
In order to access local clippings (H.264) click the **OPEN FILE** icon . Selecting **Open File** (Open File Figure 156), a Windows™ Explorer browsing dialogue is displayed. Navigate to the folder where the **.h264 native files** are. If users select the file for one single channel, MDR-Player 2.0 will automatically load the other channels (if present) corresponding to the same time frame.

Clippings (H.264 files) created with previous version MDR-Dashboard 1.0 can only be played with MDR-Player 1.0. Clippings created with MDR-Dashboard 2.0 can only be played using MDR-Player 2.0.

Selecting **Open File** requires users to browse and select a **folder by date** as illustrated (*File Browser Figure 157*).



Open File Figure 156

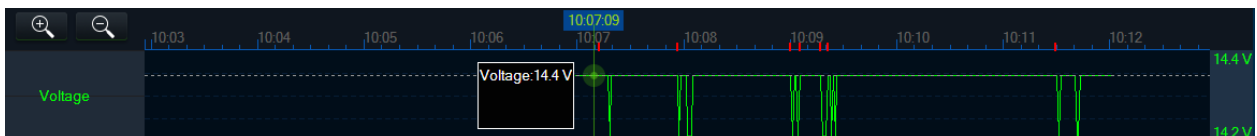


File Browser Figure 157

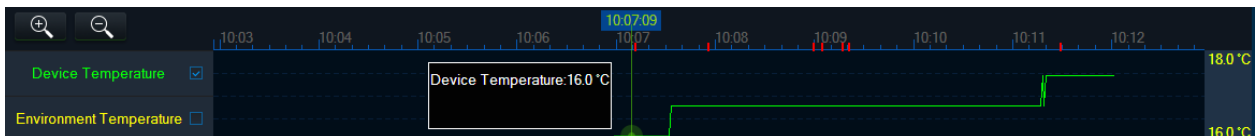
Once the data has loaded, users can play the videos (maximum 4 channels for the MDR-404xx-500 or 8 channels for the MDR-408xx-1000). Double clicking on a single channel image would trigger this channel into full screen. Audio playback from channel 1 is played when multiple channels are displayed. Users can select a different audio source by single clicking another channel image. During playback, users can zoom in/out on the timeline by either using the +/- button or by using the mouse scroll wheel.



Speed Graph Figure 158




Voltage Graph Figure 159



Temperature Graph Figure 160



G-Force Graph Figure 161

Use the  icon to access frame information. Information such as sensor trigger status, GPS location, Firmware/MCU and video recording parameters are displayed (*Frame Information Figure 161*).

Firmware and MCU Versions

GPS Location



The screenshot shows a window titled "Frame Information" with the following data:

- FW Version:** X15-8-T593003
- MCU Version:** S28-D-STM32-MCU-T501231
- Company Name:** (empty)
- Vehicle Number:** INVALID
- G-force:** INVALID
- GPS:** LON:0 14'43.03"West LAT:51 24'7.73"North ALT:0
- Speed:** 0.0 KMH, **Satellite:** 0, **Satellite precision:** 0
- Voltage:** 24.0 V
- Temperature:** 41.00 °C

At the bottom, there is a row of trigger status buttons: Li, Ri, Br, 4, 5, 6, 7, 8, PB, and IGN. The "Br" button is highlighted with a red arrow.



Trigger Status e.g. **Br** (Brake Trigger)

Frame Information Figure 162


In the maps (below) tracking information refreshes continuously while playing and displays the vehicle number (see also section 4.3.3 to set this). Zooming in and out on the map can be done using the +/- buttons; or by using the mouse scroll wheel.

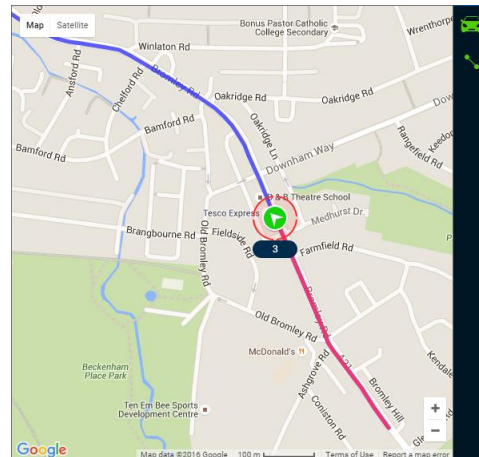
Note: The Hand tool allows users to move the map, but the image is periodically refreshed in order to keep the vehicle in the centre of the map. The red trace indicates the route that has been travelled while the blue represents the route ahead. Google Maps Satellite is also supported on the MDR-Player 2.0.

The map area has two options when viewing GPS data. When the icons are green, this implies that this feature is active.

- Lock map to vehicle automatically . This means that the vehicle will be centred in the map and users will be unable to move the map freely.
- Show Line/Hide Line  is used to show the tracking data of the vehicle's route.

There are also **zoom in** and **zoom out** buttons located on the

bottom right of the map. 



MDR-Player 2.0 Map Figure 163

10 Advanced Ethernet Configurations


This section is dedicated to an advanced feature for individuals with networking knowledge which enables users to configure an MDR from a Web Browser interface. This feature is not recommended for field operations, diagnosis and configuration.

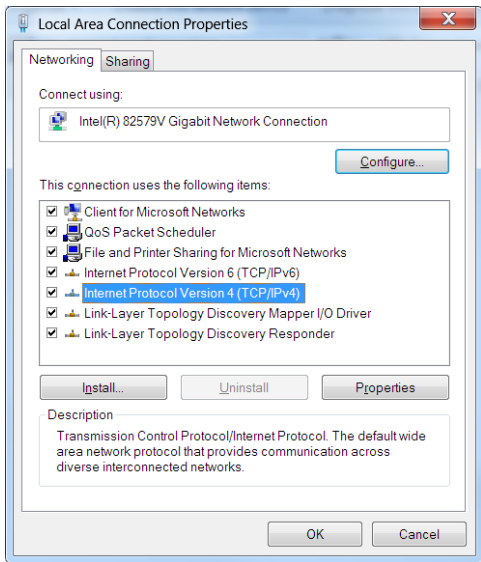
The Ethernet connection offers the following features:

- Live View of Cameras
- Playback of recordings
- Manual download of individual channel recordings

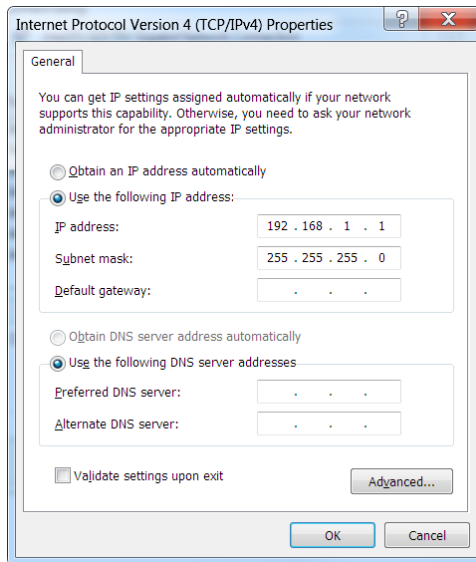
Note: The configuration requires a Cat5e Cross-Over cable, a Microsoft Windows™ Operating system; a PC with an Ethernet RJ45 port and a wireless adapter with Internet Access (may be needed to download the plugin).

10.1 Ethernet Setup:


- (a) Connect the cross-over cable to the laptop and the Ethernet LAN port on the back of the MDR.
- (b) The following steps apply to PCs running Windows 7 upwards. Before making changes to the PC's network settings, ensure the PC is not connected to a network.
- (c) *Local Area Connection Properties Figure 164* below shows the network configuration window. This dialog may be accessed by right clicking on "Open Network and Sharing Center" on the desktop . The appropriate network interface is then selected by double clicking on the corresponding entry.
- (d) Select the "Internet Protocol Version 4 (TCP/IPv4)" item and click "Properties". *Internet Protocol Version 4 Figure 165* is displayed; in this box an IP address should be entered; a good choice is **192.168.1.1** as shown in the example below. (This address is on the same subnet as the MDR, which has a default IP address of **192.168.1.100**).

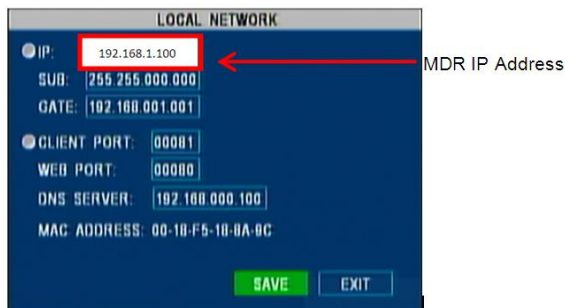


Local Area Connection Properties Figure 164



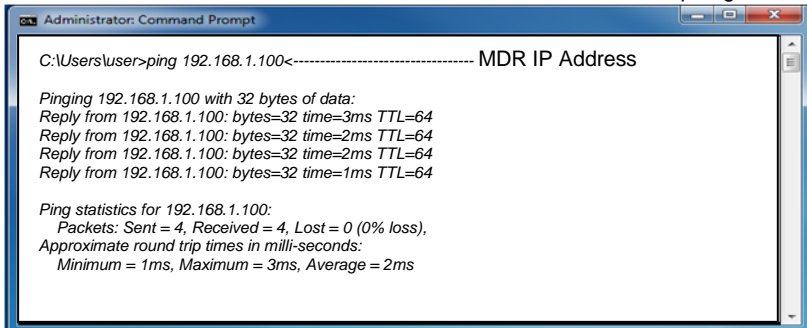
Internet Protocol Version 4 Figure 165

- (e) To locate the MDR IP, press the **ENTER** button then the **DOWN** arrow to read the current MDR IP.
- (f) In order to change the MDR IP, browse to **Settings**  → **Network** → **Local** using the remote control.



MDR Network Settings Figure 166

- (g) In order to test the PC connection to the MDR, open the Command prompt by typing cmd within the start-up menu. Ping the MDR IP address by typing **ping 192.168.1.100**. These results are shown in *Results from Command Prompt Figure 167*:



Results from Command Prompt Figure 167

Note: The web interface is **ONLY** compatible with Internet Explorer.



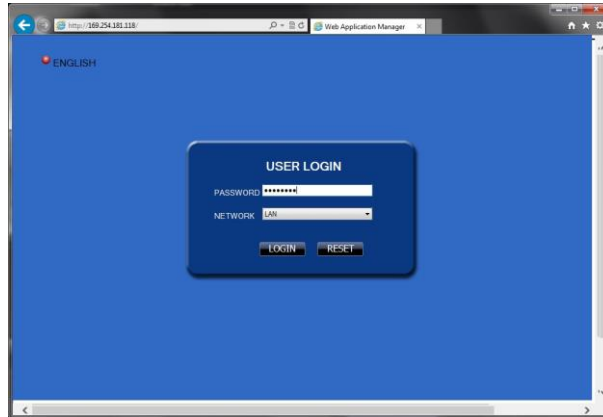
Internet Explorer Web Address Figure 168

- (h) Open an Internet Explorer web page and type the following <http://192.168.1.100>. At this point, a pop-up window will appear Internet Explorer requesting permission to allow the installation/running of a plugin "X155". See *Plugin Pop-up Figure 169*.



Plugin Pop-up Figure 169

- (i) Allow the plugin and its installation.
- (j) After the plugin is successfully installed, the login window (*Web User Login Figure 170*) will appear.



Web User Login Figure 170

- (k) There are 3 different types of login levels (as explained in section 4.3.4) i.e. **Administrator**, **Power User** and **User**. Enter the appropriate password to grant the correct permissions, and then click **LOGIN**.

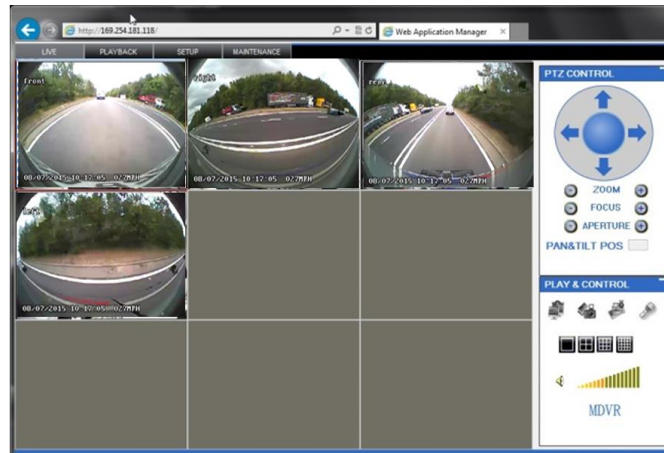
Note: If MDR security is disabled, click **LOGIN** without entering any details.

- (l) Once logged in, 4 tabs will be displayed as follows: LIVE; PLAYBACK; SETUP and MAINTENANCE. See *Web Application Manager Figure 171*.

10.2 Ethernet Operation:

- (a) LIVE tab allows users to view the live cameras as shown in Web Application Manager Figure 171.

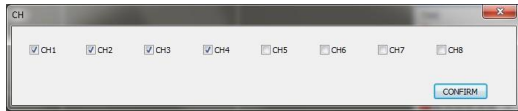
Note: The panel to the right (PTZ control and Play & Control) is not currently used.



Web Application Manager Figure 171

- (b) PLAYBACK tab allows users to view and play recordings. Users can SEARCH by selecting the date from the calendar (
- (c) *Web Playback Figure 173*), the type of recording and the source of the recording. Alternatively, scroll the list of recordings and select the recording.
- (d) Another method of viewing the recordings is by entering the date, the time and selecting the channel from the bottom left of the window.
- (e) The advantage of this method is viewing multiple channels without having a monitor connected. In *Channel Selection Figure 172* users can select which channel to be viewed.
- (f) *Web Playback Figure 173* illustrates the playback of 4 recorded channels.

Note: The playback may incur a short delay due to the limited bandwidth available (Ethernet cross-over cable). **Waiting for data** will be displayed on the bottom of the screen during loading.

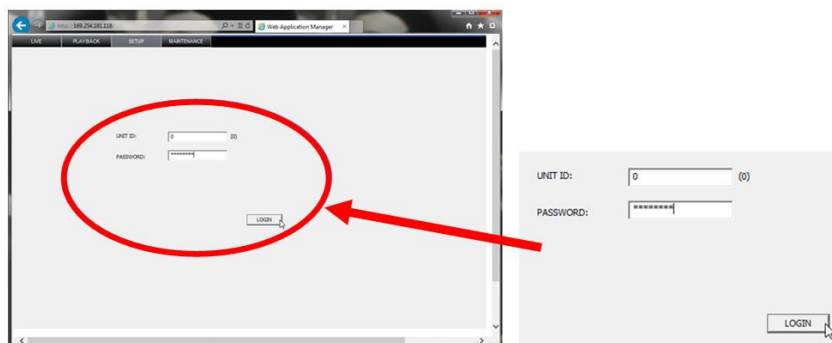


Channel Selection Figure 172



Web Playback Figure 173

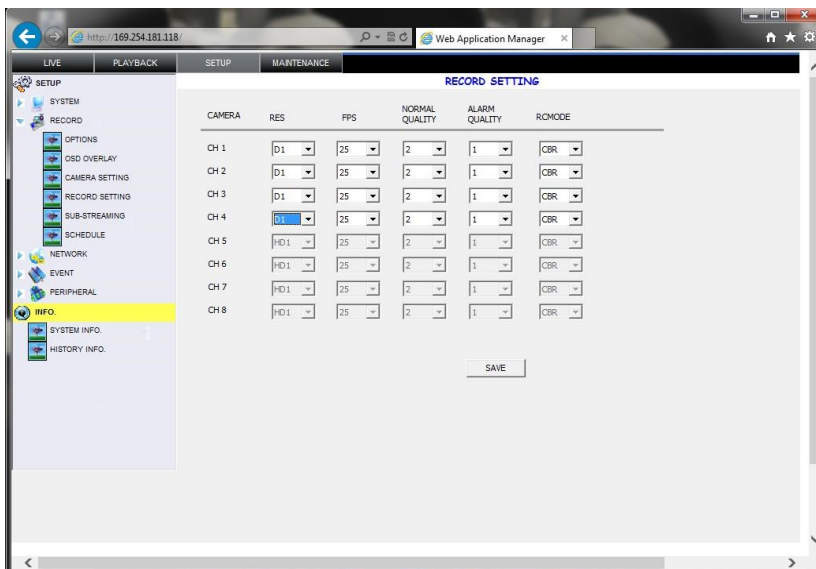
- (g) **SETUP** tab reproduces the MDR GUI as a Web application. This is a convenient method when configuring long values/text.
- (h) When the MDR security is turned **Off** (not recommended by Brigade), the setup tab is immediately shown.
- (i) When the MDR security is turned **On**, the *MDR Web Login Figure 174* will appear, requesting the Unit ID and Password (see section 4.3.4).



MDR Web Login Figure 174

- (j) After entering the appropriate password, the web interface below will appear. *MDR Web Configuration Figure 175* illustrates the corresponding menu for OSD record settings (right image from section 4.1.4). Use the **BACKUP** button to download files over the crossover cable connection.

Warning: The web interface menu below (left) does not match the OSD menu found on the MDR. Terminology may differ but the same settings can be found.

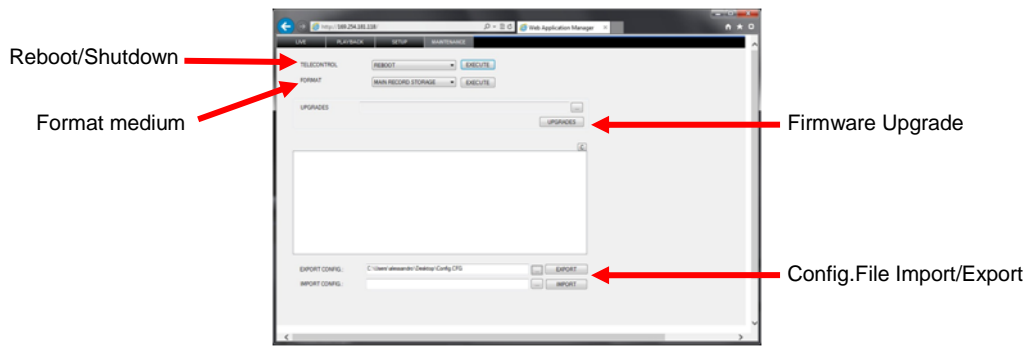


MDR Web Configuration Figure 175



Record Settings Figure 176

- (k) MAINTENANCE tab is used for the following purposes: Reboot/shutdown; storage media formatting (see section 6.1); firmware upgrades (see section 6.2); importing/exporting configuration files (see sections 6.3.3 and 6.3.4). *Web Maintenance Figure 177* shows the exporting of a configuration file from the MDR to the specified location of the Laptop PC.
- (l) Main record storage refers to HDD and sub record storage refers to SD card.



Web Maintenance Figure 177




10.2.1 Firmware Upgrade / Configuration File Import

- (a) In order to complete a firmware upgrade or config file import, please follow these steps.
- (b) Locate the files to be used for upgrade or import.
- (c) Save the firmware (.SW) or configuration file (.CFG) on the local PC such as the desktop.
- (d) Specify the file path using ... button.
- (e) The file path will then appear in the box.
- (f) For configurations click IMPORT.
- (g) For firmware upgrades click UPGRADE, the file is then sent to the MDR.
- (h) Information of its progress and completion are shown in the window.
- (i) After uploading the firmware file, the MDR will restart to complete the upgrade.
- (j) Confirm the upgrade and configuration by checking SYSTEM INFO.

10.2.2 Configuration File Export

- (a) Specify the file path using ... button. Suggest using desktop or local PC location.
- (b) The file path will then appear in the box.
- (c) For configurations click EXPORT.

11 On-screen Display Map

-  Recordings
-  Settings
-  Information

Note: *Green Italics* represents default settings.

Lucida Font represents 3G and/or Wi-Fi menu options.

11.1 Recordings

11.1.1 Rec. Search

TITLE	REC.SEARCH OPTION No 1
SOURCE	<i>HDD</i>
	MIRROR SD
TYPE	<i>ALL</i>
	ALARM
DATE	today's date

TITLE	REC.SEARCH OPTION No 1
CHANNEL	1-4
	5-8 (8CH only)
START TIME	-
END TIME	-
PLAY	-
UNLOCK	-
EXPORT	Channel selection <i>SELECT</i>
	ALL

11.1.2 Event Files

EVENT SEARCH	
TITLE	OPTION No 1
EVENT TYPE	ALL FILES
	TRIGGER INPUT
	G-FORCE
	SPEED
	TEMP ALARM
	MD ALARM
	BD ALARM
	VIDEO LOSS
DATE	TODAY'S DATE

EVENT LIST	
TITLE	OPTION No 1
FIRST	
PGUP	
PGDOWN	
LAST	
REV.	
EX LOG	
EXPORT	

11.2 Settings

11.2.1 System

11.2.1.1 Date/Time

DATE/TIME	
TITLE	OPTION No 1
(DATE) FORMAT	DD/MM/YYYY
	YYYY-MM-DD
	MM/DD/YYYY
(TIME) FORMAT	24H
	12H
TIME SYNC SOURCE	GPS
	NONE
TIME ZONE	0
	-12 to +14
DST	ON----->
	if DST MODE is ON
	OFF

TITLE		OPTION No 1	
1AM ON	LAST	SUNDAY IN	
	FIRST		MAR.
	SECOND		APR.
	THIRD		MAY
1AM ON	LAST	SUNDAY IN	JUN.
	FIRST		etc.
	SECOND		OCT.
	THIRD		NOV.
			DEC.
			JAN.
			etc.

11.2.1.2 Options

OPTIONS															
TITLE	OPTION No 1														
ON/OFF TYPE	IGNITION ----->	<table border="1"> <thead> <tr> <th colspan="2">IGNITION</th> </tr> <tr> <th>TITLE</th> <th>OPTION No 1</th> </tr> </thead> <tbody> <tr> <td>SHUT DOWN DELAY (0S-24)H</td> <td>30min (0 seconds to 24 hours)</td> </tr> </tbody> </table>	IGNITION		TITLE	OPTION No 1	SHUT DOWN DELAY (0S-24)H	30min (0 seconds to 24 hours)							
	IGNITION														
	TITLE	OPTION No 1													
	SHUT DOWN DELAY (0S-24)H	30min (0 seconds to 24 hours)													
	TIMER----->	<table border="1"> <thead> <tr> <th colspan="2">TIMER</th> </tr> <tr> <th>TITLE</th> <th>OPTION No 1</th> </tr> </thead> <tbody> <tr> <td>START-UP TIME</td> <td>06:00:00 (HH:MM:SS)</td> </tr> <tr> <td>SHUT DOWN TIME</td> <td>18:00:00 (HH:MM:SS)</td> </tr> <tr> <td>AUTO START-UP ON SCHEDULE</td> <td>OFF</td> </tr> <tr> <td></td> <td>ON</td> </tr> </tbody> </table>	TIMER		TITLE	OPTION No 1	START-UP TIME	06:00:00 (HH:MM:SS)	SHUT DOWN TIME	18:00:00 (HH:MM:SS)	AUTO START-UP ON SCHEDULE	OFF		ON	
	TIMER														
	TITLE	OPTION No 1													
	START-UP TIME	06:00:00 (HH:MM:SS)													
	SHUT DOWN TIME	18:00:00 (HH:MM:SS)													
	AUTO START-UP ON SCHEDULE	OFF													
		ON													
	IGNITION OR TIMER---->	<table border="1"> <thead> <tr> <th colspan="2">IGNITION OR TIMER</th> </tr> <tr> <th>TITLE</th> <th>OPTION No 1</th> </tr> </thead> <tbody> <tr> <td>START-UP TIME</td> <td>06:00:00 (HH:MM:SS)</td> </tr> <tr> <td>SHUT DOWN TIME</td> <td>18:00:00 (HH:MM:SS)</td> </tr> <tr> <td>AUTO START-UP ON SCHEDULE</td> <td>OFF</td> </tr> <tr> <td></td> <td>ON</td> </tr> <tr> <td>SHUT DOWN DELAY (10min-24h)</td> <td>00:30:00 (HH:MM:SS)</td> </tr> </tbody> </table>	IGNITION OR TIMER		TITLE	OPTION No 1	START-UP TIME	06:00:00 (HH:MM:SS)	SHUT DOWN TIME	18:00:00 (HH:MM:SS)	AUTO START-UP ON SCHEDULE	OFF		ON	SHUT DOWN DELAY (10min-24h)
IGNITION OR TIMER															
TITLE	OPTION No 1														
START-UP TIME	06:00:00 (HH:MM:SS)														
SHUT DOWN TIME	18:00:00 (HH:MM:SS)														
AUTO START-UP ON SCHEDULE	OFF														
	ON														
SHUT DOWN DELAY (10min-24h)	00:30:00 (HH:MM:SS)														
NON-STOP (when ticked shut down delay is disabled)	TICKED														
	UNTICKED														
MENU IDLE TIME (30-300)SEC	300														
	30-300														
EVENT FILES AUTO-EXPORT(USB)	ON														
	OFF														
MENU TRANSPARENCY	25%														
	0%; 50%; 75%														

11.2.1.3 Register Info

REGISTER INFO	
TITLE	OPTION No 1
UNIT S/N	Unique S/N (Read Only)
UNIT ID(00000-99999)	00000 (00000-99999)
COMPANY NAME	Empty (yyyyyyyy)
VEHICLE NO.	Empty (xxxxxxx)
DRIVER/ROUTE NAME	Empty (yyyyyyyy)
DEVICE ID	Empty (xxxxxxx)

where X can be any alphanumerical value and Y any alphanumerical value including symbols

11.2.1.4 Format

FORMAT	
TITLE	OPTION No 1
DEVICE	HDD
	USB
	MIRROR SD
FUNCTION	FAST FORMAT
	SLOW FORMAT

(only if HDD is selected)

11.2.1.5 Upgrade

UPGRADE	
TITLE	OPTION No 1
	FIRMWARE
	MCU

11.2.1.6 User Security

USER SECURITY	
TITLE	OPTION No 1
PASSWORD ENABLE	ON
	OFF
SELECT USER	ADMINISTRATOR
	POWER USER
	USER
PASSWORD	88888888 (00000000-99999999)
RE-ENTER	88888888 (00000000-99999999)

11.2.1.7 Configuration

CONFIGURATION	
TITLE	OPTION No 1
DEFAULT SETTINGS	DEFAULT
RESET ALL HISTORY INFO.	RESET
EXPORT CURRENT SETTINGS SAVE AS "MDRCFG.CFG" TO ROOT OF EXTERNAL STORAGE DEVICE	EXPORT
IMPORT THE "MDRCFG.CFG" FROM THE ROOT OF EXTERNAL STORAGE TO MDR	IMPORT

11.2.1.8 System Log

SYSTEM LOG	
TITLE	OPTION No 1
EXPORT SYSTEM LOG	
DELETE SYSTEM LOG	
EXPORT SNAPSHOTS	
DELETE SNAPSHOTS	

11.2.2 Record

11.2.2.1 Options

OPTIONS 1 of 3	
TITLE	OPTION No 1
VIDEO FORMAT	PAL NTSC
RECORD MODE	NORMAL ALARM TIMER
REC RATE	NORMAL I FRAME
RECORD FILE TIME(MIN)	15 30; 45; 60 (Active only if SD card recording is off)
ALARM DURATION(3-30)SEC	10 (3-30SEC)
ALARM POST REC(0-1800)SEC	0010 (0-1800)SEC
TRIGGER-OFF DELAY(0-240)SEC	005 (0-240)SEC
OPTIONS 2 of 3	
TITLE	OPTION No 1
METADATA CAPTURE	ON OFF
HDD/SD OVERWRITE	ON OFF
LOCKED FILE RETENTION(DAY)	10 7; 15; 20; 30; 45;
ALARM PRE RECORDING	ON OFF
ALARM PRE-REC TIME(1-60)MIN	10 (1-60)MIN
MIRROR SD CARD TYPE	INTERNAL EXTERNAL (fireproof box)
MIRROR SD REC	ON OFF
OPTIONS 3 of 3	
TITLE	OPTION No 1
VIDEO LOSS RECORDING	ON OFF

11.2.2.2 OSD Overlay

OSD OVERLAY 1 of 2			
TITLE	LIVEVIEW	IMAGE	POSITION
DATE/TIME	ON OFF	ON OFF	TOP BOTTOM
ALARM	TRIGGER OFF FIXED		
G-FORCE DATA	ON OFF		
TEMPERATURE	ON OFF		
FIRMWARE VER.	ON OFF		
GPS INFO.	TRIGGER OFF FIXED		
CH. NAME		ON OFF	
VEHICLE NO.	TRIGGER OFF FIXED	OFF ON	
OSD OVERLAY 2 of 2			
TITLE	LIVEVIEW	IMAGE	POSITION
SPEED	FIXED OFF TRIGGER	OFF ON	

11.2.2.3 Camera Settings

CAMERA SETTINGS (top of the screen)					
TITLE	ENABLE	NAME	AUDIO	LIV E	ENCOD E
CH[1-8]	ON	xxxxxxx	ON	ON	CBR
	OFF	where X is any alphanumeric value including symbols	OFF	OFF	VBR
CAMERA SETTINGS (bottom of the screen)					
TITLE	OPTION 1				
AUTOSN	OFF				
	ON				
AUTOSN DELAY (5-300)SEC	120	between 5 and 300 sec.			
LIVE AUDIO	OFF				
	ON				

11.2.2.4 Record Settings

RECORD SETTINGS				
PARAMETERS	RES	FR	NORMAL QUALITY	ALARM QUALITY
CH				
CH[1-8]	HD1	25	2	1
	D1	1-25	1-8	1-8
	CIF			

11.2.2.5 Sub-Stream

SUB-STREAM (top of the screen)			
TITLE	OPTION 1		
BAND WIDTH (20-4096)Kbps	0500		
	20-4096		
SUB-STREAM (left of the screen)			
TITLE	ENABLE	RES	FR
CH[1-8]	ON	CIF	5
	OFF		1-8
SUB-STREAM (right of the screen)			
TITLE	OPTION 1		
SUB MODE	ADAPT		
	FIX		
NET TRANS POLICY	PRIOR TRANS SPEED		
	PRIOR IMG QUALITY		
	BALANCE		

11.2.2.6 Schedule

SCHEDULE (top of the screen for 7x rows)				
DATE	SCHEDULE 1	TYPE	SCHEDULE 2	TYPE
EVERY	00:00-23:59	NORMAL	00:00-00:00	NORMAL
WKDAY	00:00-00:00	NORMAL	00:00-00:00	NORMAL
*****		M.D		M.D
*****		ALARM		ALARM
SCHEDULE (bottom of the screen)				
TITLE	OPTION 1			
WEEKDAY FROM	MON TO FRI			
	"Any combination of the two cells (e.g. TUE TO SUN)"			

11.2.3 Network

11.2.3.1 Local

LOCAL	
TITLE	OPTION No 1
MDR IP	192.168.001.100
SUB	255.255.255.000
GATE	192.168.001.001
CLIENT PORT	00081
WEB PORT	00080
DNS SERVER	192.168.000.100
MAC ADDRESS	Unique to each NIC of the Ethernet port

11.2.3.2 Server

SERVER 1 OF 2	
TITLE	OPTION No 1
CENTER SERVER 1:	
NET OPTION	WIFI NET. CABLE NET MOBILE NET
MESSAGE SERVER	STATIC IP ----->192.168.001.002 DOMAIN NAME
PORT	05556
MEDIA SERVER	STATIC IP ----->192.168.001.002
DNS SERVER	DOMAIN NAME
PORT	07263
SERVER 2 OF 2	
TITLE	OPTION No 1
CENTER SERVER 2:	
NET OPTION	MOBILE NET. CABLE NET WIFI NET
MESSAGE SERVER	STATIC IP ----->000.000.000.000 DOMAIN NAME
PORT	05556
MEDIA SERVER	STATIC IP ----->000.000.000.000
DNS SERVER	DOMAIN NAME
PORT	07263

11.2.3.3 Wi-Fi

WIFI	
TITLE	OPTION No 1
ENABLE	CLIENT OFF
GET IP TYPE	STATIC IP DYNAMIC IP
IP	192.168.010.004
SUB	255.255.255.000
GATE	192.168.010.001
ESSID	MDR SERVER
ENCRYPTION TYPE	WPA NONE WEP
PWD(8-63)	EMPTY

11.2.3.4 Mobile Network

MOBILE NETWORK		
TITLE	OPTION No 1	OPTION No 2
MODE NUMBER	EMPTY	
SUPPORTED NETWORK TYPES	EMPTY	
NETWORK TYPE:	MIXED 2G 3G NONE	
AUTH. MODE		CHAP PAP
ACTIVE MODE	ACTIVE MODE:	ALWAYS CALL/SMS SENSOR
CARRIER SETTINGS	DIAL PARAMETER	
	TITLE	
	APN:	EMPTY
	USERNAME:	EMPTY
	PASSWORD:	EMPTY
	ACCESS NUMBER:	EMPTY

11.2.4 Event

11.2.4.1 Sensor

SENSOR 1 of 2					
NO	ENABLE	NAME	OSD	SET	ALARM
S[1-8]	ON	xxxxxx	Li, Ri, Br, Rv, 5, 6, 7, 8	HIGH	OFF
	ON	LftInd	Li	HIGH	OFF
	ON	RgtInd	Ri	HIGH	OFF
	ON	Revrse	Rv	HIGH	OFF
	ON	Brake	Br	HIGH	OFF
	OFF	xx where X is any alphanumerical value including symbols	yy where y is any alphanumerical value	LOW	ON --->
SENSOR TRIGGER ACTION 2 of 2 (top of second page)					if ALARM ON OPTION No 1
NO	FULL SCREEN	3G ACTIVATES			
S[1-8]	NONE	OFF			
	CH1-4	ON			
	CH5-8				
	CH1; CH2; CH3; CH4				
	CH5; CH6; CH7; CH8	This option is valid for MDR-408			
SENSOR TRIGGER ACTION 2 of 2 (bottom of second page)					
TITLE OPTION No1					
FULL SCREEN TIME	03				
	03-30 seconds				

11.2.4.2 Alarm Output

ALARM OUTPUT 1 of 3			
ALARM TYPE	OUT1	OUT2	SNAP
S[1-8]	OFF	OFF	OFF
	ON	ON	ON
ALARM OUTPUT 2 of 3			
ALARM TYPE	OUT1	OUT2	SNAP
OVERSPEED	OFF	OFF	OFF
	ON	ON	ON
UNDER SPEED	OFF	OFF	OFF
	ON	ON	ON
HIGH TEMP	OFF	OFF	OFF
	ON	ON	ON
LOW TEMP	OFF	OFF	OFF
	ON	ON	ON
G-FORCE	OFF	OFF	OFF
	ON	ON	ON
VIDEO LOSS	OFF	OFF	OFF
	ON	ON	ON
MOTION	OFF	OFF	OFF
	ON	ON	ON
BLIND	OFF	OFF	OFF
	ON	ON	ON
ALARM OUTPUT 3 of 3			
ALARM TYPE	OUT1	OUT2	SNAP
LOW VOLTAGE	OFF	OFF	OFF
	ON	ON	ON
PANIC BUTTON	OFF	OFF	OFF
	ON	ON	ON

11.2.4.3 Speed

SPEED (top and centre of the page)			
TITLE		OPTION No 1	
SPEED SOURCE	GPS	if SPEED SOURCE is VEHICLE	
SPEED UNIT	VEHICLE----->	TITLE	OPTION No 1
	MPH	SPD	032
	KM/H	speed in either mph or km/h	
MILEAGE	ON----->	P/S	00057
	OFF	pulse per second	
	if MILEAGE is ON		TITLE
CURRENT MILEAGE		0000000 MILE	
CALIBRATE			
ALARM SETTINGS (bottom of the page)			
NAME	OSD	ENABLE	THRESHOLD
UNDER SPD	SPDU	OFF	010
		ON----->	speed in either mph or km/h
OVER SPD	SPDO	OFF	100
		ON----->	speed in either mph or km/h
		ALARM	OFF
		ON	
		if ENABLE is ON	
		OPTION No 1	
		if ALARM is ON	
		TITLE	
		OPTION No 1	
		LOCK	OFF
			ON

11.2.4.4 G-Force

G-FORCE			
NAME	OSD	ENABLE	THRESHOLD
G-FORCE	GF	OFF	X=5.5; Y=5.5; Z=5.5
		ON----->	acceleration in G
		if ENABLE is ON	
		TITLE	
		OPTION No 1	
		ALARM	OFF
		ON	
		if ALARM is ON	
		TITLE	
		OPTION No 1	
		LOCK	OFF
			ON

11.2.4.5 Temperature

TEMPERATURE (top of the page)			
TITLE		OPTION No 1	
TEMPERATURE UNIT	°C		
	F		
ENVIRONMENT TEMP. ALARM SETTINGS (bottom of the page)			
NAME	OSD	ENABLE	THRESHOLD
HIGH TEMP.	HT	OFF	+95F ; +35C
		ON----->	Temp. in Fahrenheit or Celsius
LOW TEMP.	LT	OFF	-4F ; -20C
		ON----->	Temp. in Fahrenheit or Celsius
		for both Hi/Lo - if ENABLE is ON	
		TITLE	
		OPTION No 1	
		ALARM	OFF
		ON	
		if ALARM is ON	
		TITLE	
		OPTION No 1	
		LOCK	OFF
			ON

11.2.4.6 Camera

MOTION DETECTION SETTINGS (top of the page)			
CH ID	M.D. SENSITIVE	M.D. AREA	B.D. SENSITIVE
1	1	SETUP	1
2 to 8	(2 to 4 for MDR-404)	2 to 4	2 to 4
ALARM SETTINGS (bottom of the page)			
NAME	OSD	ENABLE	
BLIND	BD	OFF	for all - if ENABLE is ON
		ON----->	TITLE
			OPTION No 1
MOTION	MD	OFF	ALARM
		ALWAYS--->	OFF
		SHUTDOWN DELAY	ON
VIDEO LOSS	VL	OFF	for BD/MD - if ALARM is ON
		ON----->	TITLE
			OPTION No 1
		LOCK	OFF
			ON

11.2.4.7 Voltage

LOW VOLTAGE PROTECTION	
TITLE	OPTION No 1
ENABLE	OFF ON
LOW VOLTAGE	18.0 V
VOLTAGE OF START	21.0 V
OBSERVE TIME	005 MIN
SHUT DOWN DELAY	010 MIN

11.2.4.8 Panic Button

PANIC BUTTON			
NAME	ENABLE	ALARM	LOCK
PB	ON	ON	OFF
	OFF	OFF	ON

11.2.4.9 Snap Settings

ALARM SNAP SETTINGS --> button	
CH	ENABLE
1 to 8	OFF ON

11.2.5 Peripheral

11.2.5.1 External Communication Setup

EXT. COM SETUP	
TITLE	OPTION No 1
RS485-1	REMOTE PANEL NONE
RS485-2 (MDR-404XX-500 will not have this option)	G-SENSOR NONE

11.2.5.2 Language Settings

LANGUAGE SETTING	
TITLE	OPTION No 1
CHOOSE LANGUAGE	ENGLISH RUSSIAN SPANISH POLISH PORTUGUESE TURKISH

11.3 Information

11.3.1 System

SYSTEM INFO (top of the page)			
TITLE	INFORMATION		
FIRMWARE VERSION	xxx-x-xxxxxxx		
MCU VERSION	xx-xxx-xxxxx-xxxxxxx		
SYSTEM INFO (bottom of the page)			
HDD/SD INFORMATION	CAPACITY (GB)	FREE SPACE (GB)	FREE REC TIME (HR)
HDD	xxxx.xG	xxx.xG (xx %)	xxx
MIRROR SD	xx.xG	xx.xG (xx %)	xx

11.3.2 Dial Status

DIAL STATUS			
TITLE	INFORMATION		
MANUFACTURER			
MODULE			
MODULE NAME			
SOFTWARE VERSION			
HARDWARE VERSION			
SERVICE			
ROAM			
TITLE			
DIAL STATUS			
DIAL NUM	CONNECT TIME	SEND DATA	RECEIVE DATA
xxxx	x.xxh	xxx.xxB	xxx.xxB

11.3.3 History

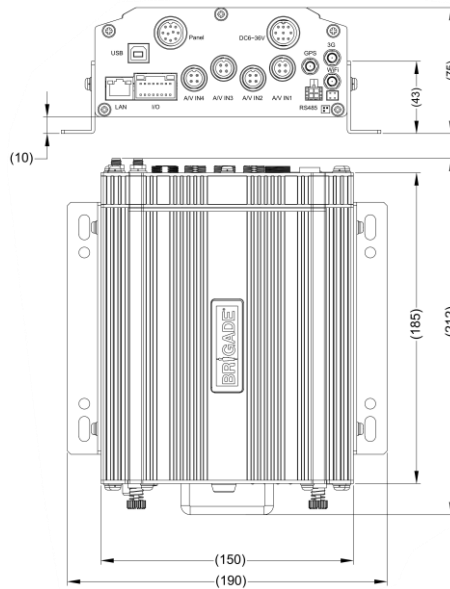
HISTORY INFO 1 of 3	
TITLE	INFORMATION
HIGHEST SPEED IN HISTORY	MPH; DATE; TIME
TOTAL MILEAGE	xxxx.x MILE
HISTORY INFO 2 of 3	
TITLE	INFORMATION
LOWEST VOLTAGE IN HISTORY	x.xV; DATE; TIME
HIGHEST VOLTAGE IN HISTORY	x.xV; DATE; TIME
HISTORY INFO 3 of 3	
TITLE	INFORMATION
LOWEST TEMP. IN HISTORY	x.XF/C; DATE; TIME
HIGHEST TEMP. IN HISTORY	x.XF/C; DATE; TIME

11.3.4 Module

MODULE STATUS	
TITLE	INFORMATION
GPS MODULE	NORMAL
	NONE
GPS SIGNAL	INVALID
WIFI MODULE	NORMAL
WIFI SIGNAL	0dB

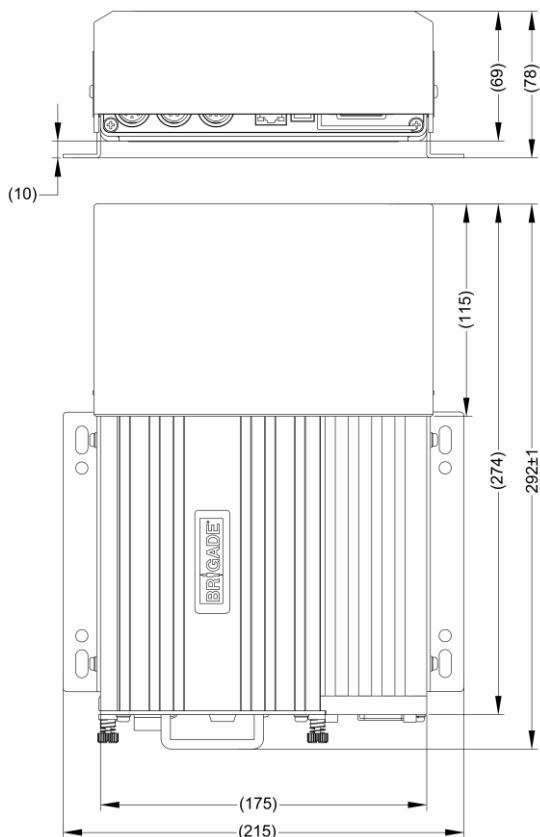
12 Mounting Dimensions

12.1 MDR-404xx-500



For mounting centre holes please refer to MDR-400-BKT drawing.

12.2 MDR-408xx-1000



For mounting centre holes please refer to MDR-400-BKT drawing.

13 Appendices

13.1 Video Quality Table

Quality level		1 (Highest)	2	3	4	5	6	7	8 (Lowest)
Video Streaming Data Rate (Kbps) depending on resolution	D1 (Highest)	2048	1536	1230	1024	900	800	720	640
	HD1	1280	960	768	640	560	500	450	400
	CIF (Lowest)	800	600	480	400	350	312	280	250

Example: Recording file size for 1 hour @ quality level 1 with resolution D1 will be:
 60 minutes * 60 seconds = 3600 seconds
 3600 seconds*2048Kbps/8/1024=900MB

Note:

- The streaming bandwidth can vary considerably according to the level of variations in the image. Static images are more efficiently compressed than dynamic ones. The values above are for reference only.
- Frame rates are assumed to be set to maximum which is 25fps for PAL and 30fps for NTSC.
- PAL: D1 (704*576), HD1 (704*288), and CIF (352*288),
 NTSC: D1 (704*480), HD1 (704*240) and CIF (352*240)

13.2 Normal / Alarm Recording Parameters

Warning: The values shown below are for reference only.

The table below summarises typical recording sizes for 1 channel at different qualities and resolutions for a one hour duration:

Quality level		1 (Highest)	2	3	4	5	6	7	8 (Lowest)
Recording data size (MB per hour) depending on resolution	D1 (Highest)	900	675	540	450	395	351	316	281
	HD1	562	422	337	281	246	219	198	176
	CIF (Lowest)	351	264	211	176	153	137	123	110

The following table is valid for both the **MDR-404xx-500** using all 4 channels and **MDR-408xx-1000** using all 8 channels. It illustrates approximate **HDD** recording times in hours:

Quality level		1 (Highest)	2	3	4	5	6	7	8 (Lowest)	fps
Recording Time onto HDD (hours) depending on resolution	D1 (Highest)	101	160	231	299	367	425	481	539	12 (8CH) 25 (4CH)
	HD1	145	204	272	340	408	466	522	580	25
	CIF (Lowest)	199	326	435	544	652	746	837	932	25

13.3 Sub-Stream Recording Parameters

The following table is valid for both the MDR-404xx-500 using all 4 channels and MDR-408xx-1000 using all 8 channels. It illustrates approximate SD recording times in hours at CIF resolution and different frame rates. Ranges of frame rates are controlled by the sub-stream bandwidth. Refer to section 4.1.5 Sub-Stream Settings.

Bandwidth		4096 Kbps	3200 Kbps	1500 Kbps	500 Kbps
Recording Time onto SD (hours) depending on frame rate	25 fps (fastest)	12			
	24 fps	12			
	23 fps	13			
	22 fps	14			
	21 fps	14			
	20 fps	15			
	19 fps	15			
	18 fps	16			
	17 fps	16			
	16 fps	17			
	15 fps		20		
	14 fps		21		
	13 fps		23		
	12 fps		25		
	11 fps		27		
	10 fps		29		
	9 fps		31		
	8 fps			37	
	7 fps			43	
	6 fps			50	
5 fps				60	
4 fps				75	
3 fps				101	
2 fps				152	
1 fps (slowest)				305	

13.4 User Log Description

Reason	Log Description	Example	Description
MDR boot up	record the time of MDR boot up	09:24:03 01 poweron;	MDR powers on
MDR power off	record the shut down time	poweroff SignalHandler(signal:XX)(pid:YY);	MDR powered off by accident. Record signal XX, thread ID YY.
		poweroff timer;	MDR Powered off by scheduled timer
		poweroff key;	MDR Powered off due to vehicle ignition off
		poweroff tork;	MDR Powered off because off time up or vehicle key pulled out
		poweroff remote;	MDR Powered off by remote control
		poweroff hddkey;	MDR Powered off by MCU key
		poweroff hdd error;	MDR Powered off by HDD error
		poweroff upgrade;	MDR Powered off because of system upgrade
video loss	record video loss information It is considered power cut off when the voltage value falls under 7V.	1.vloss channel 1 vloss;	Record how many channels lost video
		2.vloss electricity was cut off;	MDR Powers off when circuit protection kicks in
		3.vloss electricity was cut off stop record fail;	Power is cut off, and MDR processing video.
		4.vloss power was supply;	Voltage was pulled up to normal level and MDR stops using internal capacitance.
start to record	Logs when and which channel start recording. These are main record and mirror record.	1.s-record ch1;	Channel 1 starts to record.
		2.s-record mirror ch1;	Channel 1 starts to record mirror recording.
		3.s-record ch1 RCT_STARTING;	Starting to record (this kind of log record sometimes does not get stored).
record stop	Logs when and which channel stop recording. These are main record and mirror record.	1.e-record ch1;	Channel 1 stopped recording.
		2.e-record stop mirror ch1 over;	Channel 1 stopped mirror recording.
		3.e-record stop ch1 over type:1;	Channel 1 stopped recording because the system parameters were changed.
		3.e-record stop ch1 over type:2;	Channel 1 stopped recording because the system time is changed.
		3.e-record stop ch1 over type:3;	Channel 1 stopped recording because the system was upgraded.
		3.e-record stop ch1 over type:4;	Channel 1 stopped recording because the HDD has been formatted.
3.e-record stop ch1 over type:5;	Channel 1 stopped recording because HDD has not recovered by the end of the video recording.		

Reason	Log Description	Example	Description
		3.e-record stop ch1 over type:6;	Channel 1 stopped recording because of an encoding malfunction.
		3.e-record stop ch1 over type:7;	Channel 1 stopped recording because the MDR rebooted.
		3.e-record stop ch1 over type:8;	Channel 1 stopped recording because of the CPU or RAM resource limited.
		3.e-record stop ch1 over type:10;	Channel 1 stopped recording because of time settings (systime).
		3.e-record stop ch1 over type:11;	Channel 1 stopped recording because time settings (systime of Daylight saving time).
		3.e-record stop ch1 over type:12;	Channel 1 stopped recording because of copying the record log automatically.
		3.e-record stop ch1 over type:13;	Channel 1 stopped recording because the system record parameters changed.
		3.e-record stop ch1 over type:14;	Channel 1 stopped recording because the HDD was changed.
		3.e-record stop ch1 over type:15;	Channel 1 stopped recording because of a power fault.
		3.e-record stop ch1 over type:16;	Channel 1 stopped recording because the MDR fell into sleep mode.
		3.e-record stop ch1 over type:17;	Channel 1 stopped recording because of a reload of HDD drivers.
user log in parameter setting page.	user log in parameter setting page.	1.login;	Logging in
user log out parameter setting page.	user log out parameter setting page.	1.logout;	Logging out
reboot MDR to fix video records fault.	Information of fixing record files and logs.	1.09:24:03 16 abt_pwf del XXX, size YYY;	Cut off power to delete small files, XXX stands for file names, YYY stands for sizes of files.
		2.09:24:03 16 abt_pwf mod XXX.nvr,endT:YYY;	XXX stands for file name, YYY stands for end time.
		3.09:24:03 16 abt_pwf del lawless XXX;	Delete faulty recordings when rebooting MDR.
Delete record files	Usually, while stop recording or shear records, MDR will delete files which are shorter than 5 seconds (consider to be useless) then create a log.	1.r-del (XXX.nvr) t(YYY), s(ZZZ);	XXX stands for file name YYY : stands for time range of record file ZZZ : stands for size of file
Plugged in USB	N/A	1.u-insert;	USB plugged in
Unplugged USB	N/A	1.u-pull;	USB removed
Unlock HDD lock	Unlock HDD lock	1.hddkey unlock;	N/A
Modify time	Modify system time	1.set 2014-09-12 08:51:20 save type[2] MDR set time to rtc	Modify system time manually

13.5 Events Table

The following table illustrates the type of events recorded. This is illustrated in the event list search of the MDR and MDR-Dashboard 2.0(see **Error! Reference source not found.** and **Error! Reference source not found.**).

Event Type	Event Name	Description
Video Loss	VL	Video loss alarm (e.g. the camera has been either deliberately or inadvertently disconnected). Refer to section 7.1.
Blind Detection	BD	Blind camera alarm (e.g. the camera has been intentionally obstructed or a large object is obstructing the entire view). Refer to section 7.1.
Motion Detection	MD	Motion detection for video capturing when vehicles are unattended. Refer to section 4.2.6.
Triggers	Name of the Trigger (e.g. S1, S2 etc. or PB for Panic Button)	GPIO (general purpose input/output) trigger sensor alarm. Refer to section 4.2.1.
Speed Alarm	H-Speed	Over and under speed can be flagged and recorded. Refer to section 4.2.3.
	L-Speed	
G-Force	SHK	Excessive G-Force can be flagged and recorded. Refer to section 4.2.5.
Temperature Alarm	H-Temp	High and low temperature can be flagged and recorded. Refer to section 4.2.4.
	L-Temp	

14 Testing and Maintenance

14.1 Operator Instructions

This information is addressed to the operator of the vehicle where a Brigade MDR 400 Series System is installed:

- 1) The Brigade MDR 400 Series is intended to be used as a mobile digital recorder. Drivers and operators should not interact with the MDR setup menu. The remote control should be strictly used by technically trained operators when the vehicle is stationary.
- 2) Testing and inspection of the system should be carried out in accordance with this manual. The driver or operator is responsible for ensuring the Brigade MDR 400 Series System is working as intended.
- 3) Operators using this equipment are strongly recommended to check the system's operation at the beginning of every shift.

4) Improved safety can be achieved when used in conjunction with Brigade's camera-monitor systems. This may allow triggering camera views and providing additional vehicle information during manoeuvring. It is necessary to read, understand and follow all instructions received with the Brigade MDR 400 Series System.

5) The Brigade MDR 400 Series System for digital recording is intended for use on commercial vehicles and machinery equipment. Correct installation of the system requires a good understanding of vehicle electrical systems and procedures along with a proficiency in installation.

6) Keep these instructions in a safe place and refer to them when maintaining and/or reinstalling the product.

14.2 Maintenance and Testing

This information is addressed to the operator for maintenance and testing of a vehicle with the Brigade MDR 400 Series System installed. This is also to familiarise the operator with the features and behaviour of the system. More frequent inspections should be performed in cases where:

- The vehicle is operating in a particularly dirty or harsh environment.
- The operator has reason to suspect the system is not working or has been damaged.

Procedure:

- 1) Clean the camera lens and housing of any accumulation of dirt, mud, snow, ice or any other debris.
- 2) Visually inspect the cameras and MDR unit and verify that they are securely attached to the vehicle and are not damaged.
- 3) Visually inspect the system's cables and verify that they are properly secured and not damaged.
- 4) Ensure the area in front of the cameras is clear of obstacles and has the right coverage area to view objects.

If any of the following tests fail, follow the appropriate sections of this instruction guide or contact Brigade if still in doubt.

5) Activate the Brigade MDR 400 Series System and verify the LEDs (on the MDR unit front) will illuminate in the following order: PWR constant blue; HDD constant blue (MDR-408) green (MDR-404); SD irregularly flashing green (only MDR-408); REC constant green; GPS flashing green with 2 seconds intervals. REC LED indicates any kind of recording (either SD or HDD). MDR-408xx-1000 should take approximately 90 seconds and MDR-404xx-500 around 75 seconds for HDD recordings to start after a file-system check.

6) This tests can only be performed when the MDR video output is displayed on a Brigade monitor. Ensure that both the SD card and HDD are recording. Recording is shown with letter R with red for HDD or blue for SD.

7) Other tests can be performed depending on the configuration. For instance, if Video Loss is activated, any disconnected or malfunctioning camera is detected.

8) Sensor trigger activation can also be diagnosed. For instance, if a particular trigger is setup to turn a channel on full screen or set an alarm. This will be identified by the channel occupying the full screen or a red letter A (if a Brigade monitor is connected).

9) GPS, G-Sensor, Supply Voltage and Heater functioning can be easily viewed by pressing the ENTER button on the remote control (if a Brigade monitor is connected).

15 General Antennae Guidelines

- (a) Ensure that the cable is:
 - properly secured but ensure that the cable is not strained or distorted
 - routed in such a way as to avoid sharp bends
 - not run in parallel with vehicle wiring wherever possible
 - routed as far away as possible from any electronic module
- (b) Excess coaxial cable should not be coiled up as this may affect the tuning of the antenna as well as producing electrical interference. Excess cable should be laid out over a larger area to avoid potential coiling.
- (c) Before connection to the equipment the antenna system should be DC tested at the equipment end of the coaxial cable for continuity and to ensure there is no short circuit.
- (d) Antenna positions should be planned to achieve best separation between antennas while maintaining a suitably sized ground plane for each one. Each antenna should be separated by at least 50cm where possible. This includes antenna already fitted to the vehicle, for example; radio, phone and GPS devices.
- (e) Record and playback a short section to check recordings do not have or cause interference. EMC issues may cause interference to in-car entertainment equipment or other vehicle electrical equipment. Also, the antenna may pick up noise received from the vehicle or other fitted role equipment such as light bars, GPS processors and other digital (computing) equipment and present it to the radio equipment as interference. Repositioning may be required.

16 Troubleshooting

Scenario	Detection	Resolution
Loss of recording data	<ol style="list-style-type: none"> 1. ERR light will be visible on the MDR unit LED panel 2. ERR light will be shown on the Remote panel 3. If a sound buzzer is connected to one of the trigger outputs, a audible alarm can alert drivers 	<ol style="list-style-type: none"> 1. SD card is used to recover data – see the manual for recording options 2. Require the LED panel of the MDR or a remote panel to always be visible to driver 3. A sound buzzer should be installed and configured to alert drivers to errors.
System Power loss	<ol style="list-style-type: none"> 1. ERR light will be visible on the MDR unit LED panel and PWR LED will power down 	<ol style="list-style-type: none"> 1. Vehicle Battery should be replaced if it is suspected of malfunctioning 2. Low Voltage protection feature should be turned on 3. Fuses may be blown and may need to be replaced
Data Corruption due to Power loss	<ol style="list-style-type: none"> 1. ERR light will be visible on the MDR unit LED panel and PWR LED will power down 	<ol style="list-style-type: none"> 1. MDR is powered for few minutes after power loss to enable closure of recording files 2. UPS accessory can be used to power MDR up to 30 minutes depending on configuration
Video Loss	<ol style="list-style-type: none"> 1. VLOSS LED will turn on which is found on the MDR and the Remote panel 2. The trigger output can be used to trigger a sound buzzer to alert the driver 	<ol style="list-style-type: none"> 1. Cables if possible should not be installed in an area where these can be tampered with 2. Ensure cable connectors are secure before driving
No recording on SD or HDD	<ol style="list-style-type: none"> 1. ERR light will be visible on the MDR unit LED panel 2. ERR light will be shown on the Remote panel 3. If a sound buzzer is connected to one of the trigger outputs, a audible alarm can alert drivers 	<ol style="list-style-type: none"> 1. ERR light will be visible on the MDR unit LED panel 2. ERR light will be shown on the Remote panel 3. If a sound buzzer is connected to one of the trigger outputs, a audible alarm can alert drivers 4. Ensure that the Overwrite feature is turned on 5. Install 1 TB HDD or 128GB SD card
MCU failure	<ol style="list-style-type: none"> 1. Visible Physical Damage and unable to connect on PC 	<ol style="list-style-type: none"> 1. Retain a backup MCU for a vehicle 2. Ensure supplied USB cable is used 3. Ensure PC is fully upto date with Windows updates and drivers are installed
Failure due to Environment	<ol style="list-style-type: none"> 1. ERR light will be visible on the MDR unit LED panel 2. ERR light will be shown on the Remote panel 3. HDD recording cannot begin (HDD LED not ON) 	<ol style="list-style-type: none"> 1. Driver should wait a few minutes for the internal heater to heat the HDD to above 0°C – this will then start to record
Docking Station Failure	<ol style="list-style-type: none"> 1. No visible PWR LED is on 	<ol style="list-style-type: none"> 1. Ensure the MCU KEY is locked 2. Ensure that wires that are being used are protected by heatshrink
HDD inconsistent functionality (HDD Repair)	<ol style="list-style-type: none"> 1. ERR light will be visible on the MDR unit LED panel 2. ERR light will be shown on the Remote panel 	<ol style="list-style-type: none"> 1. Customers must follow the MCU removal procedure as stipulated in the manual

17 Specifications

Features

Video System	PAL/NTSC
Video Input	4x (MDR-404xx-500) / 8x (MDR-408XX-1000) Channels - Select Connector
Video Output	1x Channel - Select Connector
Video Compression	H.264
Setup or Control	IR Remote Control and Ethernet
Display Split	1 to 4 (MDR-404XX-500) / 1 to 9 (MDR-408XX-1000) Cameras Split View
Audio Input	4x (MDR-404XX-500) / 8x (MDR-408XX-1000) - Select Connector (if frame rate set above 6fps)
Audio Output	1x Channel - Select Connector
Audio Compression	ADPCM
On-Screen Display	GPS information, alarm, temperature, acceleration, voltage, firmware version, MCU version, device information, network information
Operation Interface	OSD Graphical User Interface
Image View	Normal View
Installation Direction	Any mounting direction (internal HDD anti-vibration mount)
Image Frame Rate Minimum - Maximum	1-25 FPS (PAL); 1-30 FPS (NTSC)
Image Resolution	PAL: D1 (704x576), HD1 (704x288), CIF (352x288) NTSC: D1 (704x480), HD1 (704x240), CIF (352x240) configurable for each channel
Image Quality	1-8 Adjustable Levels (1 is the Best)
Recording Mode	Normal, Alarm, Timer
Pre-alarm Recording	Range 1 to 60 minutes
Post-alarm Recording	Range 1 to 30 minutes
Shut-down delay (Post-recording)	Range 10 minutes to 24hrs
Time Duration Options per Stored File	15 (Default if Mirror recording ON)/30/45/60 minutes
Mirror Recording	SD Card
Playback of Recordings	1 Channel a time using MDR video output to monitor 1-4 (MDR-404xx-500) / 1-8 (MDR-408xx-1000) Channels using MDR-Dashboard/MDR-Player 2.0
File Search Mode Options via OSD	Date/Time/Channel/File Type
Built in Heater	At -25°C HDD records after approx. 9 minutes, SD records after 1 minute Threshold temperature is 0°C for heater to turn ON
Built-in GPS	GPS location tracking, speed detection and sync clock
G-Sensor	Optional external for MDR-404XX-500) / standard internal or optional external for MDR-408XX-1000
Storage Capacity (GB)	500GB for MDR-404XX-500) / 1TB for MDR-408XX-1000, 2.5" SATA HDD (1TB maximum) 32GB for MDR-404XX-500 / 64GB for MDR-408XX-1000, Class 10 SD Card (128GB maximum)
Storage Capacity (Hours of Recordings)	Best - 142 hours (Quality 1; Res. D1; 25/30fps) Typical - 1164 hours (Quality 8, Res. CIF; 25/30fps) Longest - 1862 hours (Quality 8, Res. CIF, 1fps)
Access Mode	Password Protected Access and 3x User Levels
Languages	OSD in English, Russian, Spanish, Polish, Turkish and Portuguese MDR-Dashboard 2.0 and MDR-Player 2.0 in English only.
MDR Status LEDs (Front of the Unit)	Heater, HDD, Network, Error, Power, Recording, Alarm, Video Loss, SD (only MDR-408XX-1000) GPS (only MDR-408XX-1000)

Network Interface

Mobile Standards	2G/3G [MDR-404GW-500, MDR-408GW-1000, MDR-408G-1000 and MDR-404G-500 only]
Mobile Operating Bands	WCDMA/HSDPA/HSUPA/HSPA+: Band 1, Band 8, all bands with diversity. GSM/GPRS/EDGE: 850 MHz/900MHz/1800MHz/1900MHz [MDR-404GW-500, MDR-408GW-1000, MDR-408G-1000 and MDR-404G-500 only]
Mobile Data Services	GPRS: Upload 85.6kbit/s, Download 85.6kbit/s/EDGE: Upload 236.8kbit/s, Download 236.8kbit/s WCDMA: Upload 85.6kbit/s, Download 85.6kbit/s/HSPA+: Upload 5.76Mbit/s, Download 21.6Mbit/s [MDR-404GW-500, MDR-408GW-1000, MDR-408G-1000 and MDR-404G-500 only]
SIM Card Type	DATA ONLY [MDR-404GW-500, MDR-408GW-1000, MDR-408G-1000 and MDR-404G-500 only]
SIM Card Size	Standard [MDR-404GW-500, MDR-408GW-1000, MDR-408G-1000 and MDR-404G-500 only]
Wireless Standard	802.11n/g/b [MDR-404GW-500, MDR-408GW-1000, MDR-408W-1000 and MDR-404W-500 only]
Maximum Wireless Transmission Rate	150Mbps (802.11n only) [MDR-404GW-500, MDR-408GW-1000, MDR-408W-1000 and MDR-404W-500 only]
Wireless Security Standards	64/128-bit WEP Encryption 128 bit WPA/WPA2, WPA-PSK/WPA2-PSK (TKIP/AES) [MDR-404GW-500, MDR-408GW-1000, MDR-408W-1000 and MDR-404W-500 only]

Windows Software

File Download via	USB 2.0
Image Search by time/date	MDR-Dashboard 2.0
Review Alarm Events	MDR-Dashboard 2.0
View Exported Recordings	MDR-Player 2.0
3G and Wi-Fi Server Functionality	MDR Server 1.0

Mobile Applications

MDR 2.0 Android Operating System	MDR 2.0 Version 1.0
MDR 2.0 iOS Operating System	MDR 2.0 Version 1.0

Connections/Interfaces

USB-A Interface	USB 2.0 x 1
USB-B Interface Docking Station	USB 2.0 x 1 - Connect to Fireproof Box
USB-B Interface Mobile Caddy Unit	USB 2.0 x 1 - Connect to PC
Serial Interface (4CH Only)	RS485 x 1 for G-Sensor or Remote Panel on MDR-404XX-500 RS485 x 2 for G-Sensor and Remote Panel on MDR-408XX-1000

Network Ethernet	RJ45 port (10/100Mbps/s)
Panel Interface	10 pin panel connector with cable to Select type connector for Brigade monitor
AV Input	4x (MDR-404xx-500) / 8x (MDR-408xx-1000) Select type connectors
Trigger Input/output	Trigger inputs x 8, Trigger outputs x 2, 12V OUT x 1, GND x 1
GPS	1x SMA Connector to external antenna
3G	1x SMA Connector to external antenna
Wi-Fi	1x SMA Connector to external antenna
Power Input	9 pin power connection with tail cable

Mechanical Specification

Dimensions typ. Assembly (W x H x D) including brackets	190mm x 75mm x 212mm for MDR-404XX-500 215mm x 78mm x 292mm for MDR-408XX-1000
Weight (Docking Station and Mobile Caddy Unit)	2.2kg for MDR-404XX-500 2.75kg for MDR-408XX-1000

Materials

Finish or Coating of Outside Surface	Black Gloss Textured
Material of Caddy Unit	Aluminium
Material of Mobile Caddy Unit	Aluminium
Material of Bracket	Aluminium

Electrical Interface

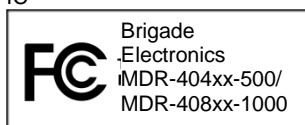
Operating Voltage (min. / typ. / max.)	9V / 12V / 32V (without any cameras and any accessories)
Quiescent Current	At 12V: 100mA, At 24V: 10mA [MDR-404XX-500] At 12V: 150mA, At 24V: 90mA [MDR-408XX-1000]
Current Consumption (min. / typ. / max. per mode)	MDR-404XX-500: 270mA (stable @ 32V) / 620mA (stable @ 12V) / 6.9A (inrush @ 9V) (without any cameras and any accessories) MDR-408XX-1000: 290mA (stable @ 32V) / 800mA (stable @ 12V) / 5.47A (inrush @ 9V) (without any cameras and any accessories)
Power Consumption	12W (without any cameras and any accessories)
Trigger Inputs	8x (approx. 3.9V threshold input voltage)
12V Supply Output	1x 12V @ 1A Maximum Load
Trigger Outputs	2x 12V at 200mA Maximum Load
Video Input/output	1.0 Vp-p / 75Ω
Maximum Camera Supply Current	500mA
Power-up Time to Recording	72 Seconds for MDR-404xx-500 90 Seconds for MDR-408xx-1000

Test and Environmental Specification

Operating Temperature Range	-25°C to +60°C (built-in heater active for HDD if temperature below 0°C)
Storage Temperature Range	-40°C to +70°C
Vibration Rating (Peak Acceleration in g and Test Standard)	1G
Shock Rating (Peak Acceleration in g and Test Standard)	40G
Ingress Protection	IP30
Operating Relative Humidity	10% to 90%

Approvals

CE
 UNECE Regulation No. 10 Revision 4 ("E-marking")
 FCC
 IC



This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any change or modifications not expressly approved by the responsible party responsible for compliance could void the user's authority to operate the equipment.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. For products available in the US and Canadian markets, only channels 1-11 are available. You cannot select other channels. This device and its antennas must not be co-located or operated in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures. This device operates in the ~2.4GHz frequency range. It is restricted to indoor environments only.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. For products available in the US and Canadian markets, only channels 1-11 are available. You cannot select other channels. This device and its antennas must not be co-located or operated in conjunction with any other antenna or transmitter except in accordance with IC multi-transmitter product procedures. This device may automatically discontinue transmission if there is no information to transmit, or an operational failure. Note that this is not intended to prohibit the transmission of control or signalling information or the use of repetitive codes where required by the technology. To reduce potential for harmful interference to co-channel mobile satellite systems, this device operates in the 5150-5250 MHz band, and is for indoor use only.

18 Glossary

3G – Third Generation

AC – Adaptor Cable

ADPCM – Adaptive Differential Pulse-code Modulation

Alarms – An “EVENT” that has been configured (in the MDR unit settings) to be an alarm. Alarms are identified as orange video channel data on the playback timeline.

These are displayed in the real-time alarm log in the MDR-Dashboard and MDR Mobile Apps. Alarms can generate email alerts and trigger automatic downloads (dependant on MDR-Dashboard configuration).

Automatic Download – A download that is set up in the MDR-Dashboard to automatically download data related to an occurring “Alarm” or “Event” between user-defined times. Configured under Download in MDR-Dashboard.

APN – Access Point Name

AVI – Audio Video Interleaved

BD – Blind Detection

CBR – Constant Bit Rate

CE – Conformité Européenne

CH – Channel

CHAP – Challenge Handshake Authentication Protocol

CIF – Common Intermediate Format (¼ D1 format)

CPU – Central Processing Unit

CU – Control Unit

D1 – D1 is full standard resolution for 25FPS (PAL) and 30FPS (NTSC)

DS – Docking Station

DST – Daylight Saving Time

EDGE – Enhanced Data GSM Environment

EIA – Electronic Industries Alliance

Events – An activation of an input e.g. Sensor input (trigger 1-8), G Sensor, Over speed etc. Events are identified as red vertical lines on the playback timeline. These are not shown in the real-time alarm log.

EXP – Expansion

FCC – Federal Communications Commission

FPB – Fireproof box

GB – Gigabyte

GHz – Gigahertz

GND – Ground

GPIO – General Purpose Input/output

GPRS – General Packet Radio Service

GPS – Global Positioning System

GSC – G-sensor Cable

G-Sensor - measure of acceleration/shock of the vehicle

GSM – Global System for Mobile Communications

GUI - Graphical user interfaces

H.264 – Video compression standard

HD1 – Half Definition compared to Full Definition (See D1)

HDD – Hard Disk Drive

HSDPA – High Speed Downlink Packet Access

HSPA – High Speed Packet Access

HSUPA – High Speed Uplink Packet Access

IC – Industry Canada

ID – Identification

IO – Input/output

iOS – i Operating System

IP – Internet Protocol

IR – Infra-red

IT – Information technology

Km/h – Kilometres per hour

LAN – Local Area Network

LED – Light Emitting Diode

MAC – Media Access Control

MB – Megabyte

MCU – Mobile Caddy Unit

MD – Motion Detection

MDR – Mobile Digital Recorder

MHz – Megahertz

MPH – Miles per hour

NET – Network

NTSC – National Television System Committee

OSD – On-screen Display

PAL – Phase Alternating Line

PAP – Password Authentication Protocol

PC – Personal Computer

PN – Part Number

PTZ – Pan, Tilt and Zoom

PWR – Power

REC – Record

RES – Resolution

RP – Remote Panel

RPC – Remote Panel Cable

S/N – Serial Number

Scheduled Download – A download that is manually setup from in the MDR-Dashboard (to be downloaded when the selected MDR connects to the server). Configured under Server in MDR-Dashboard.

SD – Secure Digital

SIM – Subscriber Identity Module

SMTP – Simple Mail Transfer Protocol

SPD – Speed

SQL – Structured Query Language

SSL – Secure Sockets Layer

TB – Terabyte

TIA – Telecommunications Industry Association

TRIG – Trigger

UNECE – United Nations Economic Commission for Europe

UPS – Uninterruptable Power Supply

USB – Universal Serial Bus

V – Voltage

VBR – Variable Bit Rate

VGA – Video Graphics Array

VIC – Video Input Cable

VL – Video Loss

VOC – Video Output Cable

W – Watt, standard unit of power

WCDMA – Wide Code Division Multiple Access

Wi-Fi – Wireless Fidelity

