



Contents.

Before You Begin..... 5

 Important Safeguards and Warnings. 6

 Introduction. 7

System Overview..... 8

 Main System. 8

 Front Panel. 10

 Rear Panel. 11

 comrad™ 13

Installation..... 15

 Ten Steps for Installers 15

 Suggested System Locations. 16

 Mounting the System. 16

 Recommended Location for Record LED. 18

 Routing the Power Harness. 19

 Routing the Camera Harness(es). 19

 Routing the Sensor Harness. 20

 Installing the Dome Camera. 21

 Recommended Camera Locations. 24

 Check For: 24

 Quick Configuration Settings for Installers. 25

Setting the Configuration..... 26

 Basic Configuration. 26

 Advanced Configuration. 30

 System Configuration. 38

Recording..... 43

 Start Recording. 43

 Stop Recording. 43

Playback from Recorder..... 44

 Playback Methods. 44

System Shutdown. 48

Downloading Video. 49

 comrad™ Only to Computer (Recommended). 49

 Connecting the Recorder to a Computer. 49

 Recorder to Local Area Network (LAN). 50

 comrad™ Only to Computer. 50

 Manually Installing MAXVIEW™. 51

 Connecting the Recorder to Computer WITH USB Ethernet Adapter. 51

 Browsing the Recorder on a Computer. 53

Contact Information.

GSI – Canada
301-31127 Wheel Avenue
Abbotsford, BC V2T 6H1
Canada

GSI – USA
446 Harrison Street
Sumas, WA 98295
USA

Sales & Technical Support

North America:
Tel: 1.604.864.6187
Fax: 1.604.864.8472

Toll Free: 1.888.666.4833

Recorder to Local Area Network (LAN). 54

MAXVIEW™.....55

PC Requirements. 55

Installation. 55

Connect comrad™ to Computer via USB: 56

Operation. 59

Opening Video Files. 59

GPS. 59

Using The GPS Zoom Feature. 61

Using The Scrubber. 61

Time Graph Selection. 61

Using The Calendar Feature. 62

Audio Controls. 63

Displaying Sensors. 63

Drag and Drop a Video File. 64

Mark & Save a Video Clip. 64

Extracting Still Image. 65

Setting the Recorder Configuration. 66

Saving Configuration. 70

Loading Configuration on Recorder. 70

Check for Updates.. 71

Upgrading Software on the NiTRO™ 1000.74

Troubleshooting.....75

Appendix76

Setting The System ID 76

Main Power Harness. 76

Sensor Harness Cable [CAB000145] 77

Warranty.....80

Contact Information.82



Table of Figures.

Figure 1: Front Panel..... 10

Figure 2: Rear Panel..... 11

Figure 3: Power Input – Pin-outs..... 12

Figure 4: Sensor Input – Pin-outs. 12

Figure 5: comrad™ - Front and Rear Panels. 13

Figure 6: comrad™ Extraction..... 13

Figure 7: Recommended System Locations 16

Figure 8: IR20, Camera Location and Wiring. 17

Figure 9: Alarm Button/Record LED Splice..... 18

Figure 10: Ceiling Mounting the Camera..... 22

Figure 11: Focusing The Camera 22

Figure 12: Changing Camera Lens 23

Figure 13: Three Camera Configuration..... 24

Figure 14: Four Camera Configuration..... 24

Figure 15: Alternate Four Camera Configuration. 24

Figure 16: Table of Available Frame Rates..... 35

Figure 17: Cloning a comrad™. 42

Figure 18: Record Screen..... 43

Figure 19: Stop Screen..... 43

Figure 20: Playback Display..... 45

Figure 21: Mark and Save..... 46

Figure 22: Downloading Clips..... 47

Figure 23: Manually Installing MAXVIEW™..... 51

Figure 24: Browsing The Recorder On A Computer..... 53

Figure 25: Recorder To Local Area Network..... 54

Figure 26: MAXVIEW™ Operation..... 59

Figure 27: Composite of Map; Satellite and Hybrid Views..... 60

Figure 28: Displaying The GPS Map..... 60

Figure 29: Displaying The GPS Vehicle Locator..... 60

Figure 30: Calendar Feature..... 62

Figure 31: Mark and Save Clips..... 64

Figure 32: Save Video Clip Options Window..... 65

Figure 33: Upgrading Software..... 74


<p>the required repairs or replacements and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale. Proof of purchase complete with the serial numbers of the products purchased will be required by the customer to substantiate any warranty claim. All warranty work must be performed by an authorized Gatekeeper Systems service representative.</p> <p>This warranty does not cover any Gatekeeper Systems' product that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified by Gatekeeper Systems either verbally, in writing, by instructions written on the product or in the Gatekeeper Systems Installation and Operating Manual. This warranty does not apply to any damage to the Gatekeeper Systems product that is the result of improper maintenance or to any Gatekeeper Systems' product that has been altered or modified so as to adversely affect the products' operation, performance or durability or that has been altered or modified so as to change its intended use.</p>	
<p>USA RECEIVING FACILITY: Gatekeeper Systems Inc. 446 Harrison Street Sumas WA 98295 Tel. 1.604.864.6187 Fax 1.604.864.8490 Toll Free (N.A.) 1.888.666.4833</p>	<p>verified the Company will issue a return material authorization number (RMA) authorizing the purchaser to return faulty merchandise to the Company for repair or replacement as determined by the Company. It may be necessary for the customer to assist Gatekeeper Systems in assessing failed product. Gatekeeper Systems may require the customer to remove hardware, manipulate software and/or perform other diagnostic activities. Failure to assist in and allow remote diagnostic activities may result in a service fee being charged.</p> <p>Advance replacements will be issued for the first 45 days from the date of shipment.</p> <p>This Warranty applies to all Company products manufactured by Gatekeeper Systems and sold in the United States and Canada.</p> <p>This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.</p>
<p>CANADA OPERATIONS: Gatekeeper Systems Inc. 301-3 1127 Wheel Avenue Abbotsford BC V2T 6H1 Tel. 1.604.864.6187 Fax. 1.604.864.8490 Toll Free (N.A.) 1.888.666.4833</p>	




Warranty.

Before You Begin.


In this document, important information is displayed using the following symbols:




Alerts the reader that not adhering to the instruction could result in bodily harm, equipment damage or data loss



Alerts the reader to a strong recommendation that will enhance the performance of the recorder



A useful suggestion or tip for the advantage of the reader



Alerts the reader to refer to a section of the manual that will aid in further explanation of the topic at hand



Customer Limited Warranty

GATEKEEPER SYSTEMS INC. (Company) warrants that any product manufactured or supplied by Gatekeeper Systems and found in the reasonable judgment of Gatekeeper Systems to be defective in material or workmanship will be repaired or replaced by Gatekeeper Systems without charge for parts and labor.

This warranty shall cover the following periods and equipment:

Camcorder System

Cameras - 1 year
Battery Adapters - 1 year
Plates & Enclosure Boxes - lifetime

Gatekeeper System

Interior Cameras - 5 years
Exterior Cameras - 3 years
VCR - 1 year
GSX-900 / 1000 Digital Recorder - 1year
NITRO-900 / 1000 Digital Recorder – 5 years (hard drives limited to 3 years)
Nitro 401 and Nitro 404 Digital Recorder – 3 years
Kingston SDHC Memory Card – Lifetime
All Accessories - 1 year

The warranty periods commence on the date of shipment. During the period of the warranty the Company, at its discretion will repair and/or replace all improperly functioning equipment caused by a manufacturer's defect. This warranty does not protect against accidental or intentional damage, vehicle electrical systems generating steady state or transients, voltages or currents exceeding product specification, loss, acts of nature, water damage, or any other event that did not originate during the manufacturer of the product. DVR's must be returned once every twelve months for service otherwise warranty may be void.

The Gatekeeper Systems product including any defective part must be returned to Gatekeeper Systems within the warranty period. The expense of delivering Company product to Gatekeeper Systems for warranty work will be paid by the customer. The expense of delivering Company product back to the customer will be paid by Gatekeeper Systems. Gatekeeper Systems' responsibility in respect to claims is limited to making

Gatekeeper Systems' is not responsible for lost or missing video.

The warranty does not extend to repairs made necessary by normal wear or by the use of parts or accessories which are either incompatible with the Company product or adversely affect its operation, performance or durability.

Gatekeeper Systems reserves the right to change or improve the design of any Company product without assuming any obligation to modify any product previously manufactured.

ALL IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE SPECIFIED PERIOD FOR EACH PRODUCT CATEGORY AS LISTED IN THIS DOCUMENT. ACCORDINGLY, ANY SUCH IMPLIED WARRANTIES INCLUDING MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, ARE DISCLAIMED IN THEIR ENTIRETY AFTER THE EXPIRATION OF THE APPROPRIATE WARRANTY PERIOD. GATEKEEPER SYSTEMS' OBLIGATION UNDER THIS WARRANTY IS STRICTLY AND EXCLUSIVELY LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS, AND GATEKEEPER SYSTEMS DOES NOT ASSUME OR AUTHORIZE ANYONE TO ASSUME FOR THEM ANY OTHER OBLIGATION.

GATEKEEPER SYSTEMS ASSUMES NO RESPONSIBILITY FOR INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO THE EXPENSE OF RETURNING THE COMPANY PRODUCT TO GATEKEEPER SYSTEMS CORPORATE HEAD OFFICE, MECHANIC'S TRAVEL TIME, CUSTOMER LABOR EXPENSES, TELEPHONE OR TELEGRAM CHARGES, RENTAL OF LIKE PRODUCT DURING THE TIME WARRANTY SERVICE IS BEING PERFORMED, TRAVEL, LOSS OF USE OF THE PRODUCT, LOSS OF TIME OR INCONVENIENCE.

Warranty Service

To obtain warranty service, the purchaser must notify the Company during the warranty period. The Purchaser will discuss the defect or problem with a Company technician, and once the problem has been



Important Safeguards and Warnings.



Remove Main Power Fuse Prior To Any Electrical Work Or Jump Starting The Bus.

CAUTION

RISK OF ELECTRIC
SHOCK.
DO NOT OPEN



Connect 12V constant directly to the battery.



The NiTRO™ 1000 is intended for indoor use; keep away from water and moisture.



The NiTRO™ 1000 must be mounted more than two feet away from any two-way radio equipment. Do not mount the NiTRO™ 1000 near a heat source and do not block vents on the enclosure.



Do not remove the comrad™ from the NiTRO™ 1000 system until the system has fully powered down. To ensure that the system has fully powered down, check that the comrad™ power light is off.



The NiTRO™ System is incompatible with GSX System. Do not plug the GSX comrad™ to the front of the NiTRO™ System or plug the NiTRO™ comrad™ to the front of the GSX System either physically or by USB.



Do not remove the cover of the NiTRO™ 1000. Doing so will directly result in voiding the manufacturer's warranty. If your NiTRO 1000 requires repair, contact Gatekeeper Systems Inc. (GSI) at 1.888.666.4833.



The NiTRO™ System power negative cable should be connected to a solid chassis grounding area, or negative post of battery.



All unused cables, sensor/indicator wires should be individually insulated, tied off and protected from touching ground. Unused NiTRO™ cabling should never be grounded.

[illegible]

Notes.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Introduction.

Congratulations on your purchase of the NiTRO™ 1000 Digital Smart Recorder™ from Gatekeeper Systems Inc. Prior to installing or using the NiTRO™ 1000, please read this manual in its entirety in order to fully understand the correct procedures for installation, setup and operation of the system.

The NiTRO™ 1000 Digital Smart Recorder™ has been designed specifically to be a user friendly and cost-effective replacement for conventional VHS analog recorders currently used in the industry.

The NiTRO™ 1000 is a 4 channel digital video recorder that records all four channels simultaneously; this ensures all critical data is captured. Navigation through user menus is made simple through the use of the front panel mounted LCD screen which also eliminates the need for a PC interface during setup. The NiTRO™ 1000 Digital Smart Recorder™ is a simple and efficient method of managing video onboard your school buses.

The advanced digital recording technology of the NiTRO™ 1000 eliminates the need for tape management and replacement while offering:

- ✓ comrad™ portable, vandal resistant hard drive and storage device
- ✓ Isolation Suspension System
- ✓ Thermal Intelligence™
- ✓ Direct Connect USB 2.0
- ✓ Alarm Button Verification
- ✓ LCD Smart Search™ User-friendly and convenient way to find important images and clips
- ✓ Proprietary video management MAXVIEW™ Video Management System.
- ✓ Substantial storage capability without compromising video quality
- ✓ Accelerated download speeds
- ✓ User friendly, intuitive design for easy operation and administration
- ✓ Plus many more features

System Overview.

Check List.

Use the provided check list to ensure that you have received all the components required for your complete NiTRO™ 1000 Digital Smart Recorder.

Main System.


 NiTRO™ 1000 Digital Smart Recorder
GSX-N1000Control/GSX-N1000comrad™XXX
(color may vary from that of illustration)

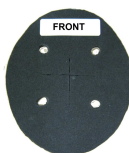


 NiTRO™ Mounting Plate
GSX-NBSPSYS



 NiTRO End Caps
GSX-NRDOOR / GSX-NFDOORWL

 Dome Camera(s)
CAMICAGSCX.XX
Camera Gasket



 Power Harness
CAB000139



 Sensor Harness
CAB0000145



 Camera Harness
GSWHC2N-XX



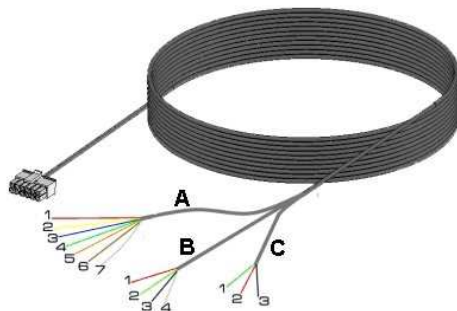
If you have failed to receive any of the above parts please contact your dealer or GSI directly at 1.888.666.4833.

Sensor Harness Cable (CAB000145)

The Sensor Harness Cable is made up of three separate inner-core cables; **A** Trigger (7 wires); **B** Alarm & LED (4 wires); **C** Speed (3 wires)

A. Trigger Sensor Harness.

1. Red. Connect to accessory 12V+ . Provides ignition to Digital Video Recorder. DO Not connect to noise suppression circuit, connect to true Ignition source.
2. Yellow. Connect to Stop Arm (8 way) circuit 12V+
3. Blue. User customizable sensor (optional) 12V+
4. Green. User customizable sensor (optional) 12V+
5. Orange. Connect to Brake light circuit 12V+.
6. Brown. User customizable sensor (optional) 12V+
7. White. Connect to Warning light (Amber) circuit, 12V+.



B. Alarm & LED Harness (4 wires):

1. Red. 12V+ output from unit. Connect to Red wires from Alarm Button and Record LED. **Do Not** hook-up to 12V Input signal.
2. Green. Connect to White wire from Record LED.
3. Black. Connect to Black wire from Alarm button.
4. White. (Optional), connect to 12V Driver Alarm Buzzer or Light Accessory

C. Speed Sensor Harness (3 wires), Not required with GPS.

1. Green. Connect to Speed Pulse. (See transmission or ABS electrical manual for your vehicle.
2. Red. Output from Digital Video Recorder, (Only to be used with Speedometer Interface Modules)
3. Black. Ground Signal (-) from Digital Video Recorder. (Only to be used with Speedometer Interface Modules)

Appendix.

Setting The System ID

Once the system has booted and is in Record mode, press the button directly below either the Right or Left pointing arrow until you see Configuration. Press the GO button.

Cycle through the options until you see Basic listed, Press the GO button.

Cycle through these options until you see Set ID, Press the GO button.

Clear the long serial number from the screen by pressing the ‘-’ button. To change a character use the + and - buttons to cycle through until you see the character you require. Use the Left and Right arrow button to advance or go back. Repeat this sequence until you have the desired name. To create a space cycle through the characters until the end of all the lower case letters.

Once the ID has been set, press the BLUE menu button to the left of the LCD.

Once the BLUE menu button has been pressed you will see the screen change to Saving Config.

A confirmation screen will appear stating Config Saved. Continue through the BASIC menu to change and confirm all parameters you need.

Main Power Harness.

The Main Power Harness Cable contains two wires

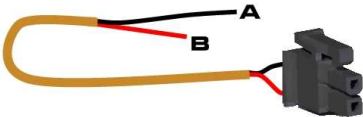
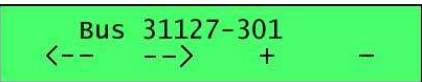
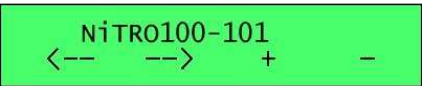
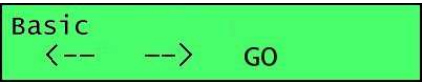
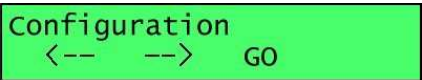
A Negative Wire. B Positive Wire.

Please ensure Main Power Cable is hooked up before any battery cut-off or isolation circuits.

A. Hook the Black wire directly to the Negative Battery Terminal.

B. Connect the RED wire directly to the Positive Battery Terminal. Ensure that the 10 AMP fuse is in-line between the Red wire and the Positive Battery Terminal.

NOTE: The 15 AMP Fuse must be pulled when jump starting the bus battery, or, when doing electrical work. Failure to comply with these instructions may result in the warranty being voided.



There are two optional download packages that are available to customize your NiTRO™ 1000 system. Use the below check list to ensure you have received the appropriate parts for your kit.

- NiTRO™ comrad™ Connect Kit
GSX-NTR-DPBK-Basic Kit
- Dual-Head USB Cable
DVRUSBN-GB-MIX
- NiTRO™ comrad™ Power Supply
DVRPWRN_3A-125WU05
- NiTRO™ Installation and Setup Kit
GSX-NTR-DPAK-Intermediate Kit
- NiTRO™ comrad™ Connect Kit
GSX-NTR-DPBK-Basic Kit
- Camera Alignment Cable
CAB000157
- DC to DC Cable
CAB000149
- RCA Single patch Cable
DVRWPCRC-150
- Direct Camera Connect Cable
CAMWHAVIDEOCABLE

Accessories

The following accessories are available for the NiTRO 1000 Digital Smart Recorder™.



For details on installation refer to individual instruction sheets enclosed with each accessory.

- NiTRO™ - Desktop Power Supply
- NiTRO™ - Record LED
- NiTRO™ GPS (Build Option)
- NiTRO™ - Alarm Button
- IR Illuminator
- IR Quick Connect

Front Panel.



Figure 1: Front Panel.

- 1 **comrad™** - Removable hard drive. **DO NOT PULL comrad™ OUT WHILE SYSTEM IS RUNNING.**
- 2 **Main Menu Button** - Press to save settings, move up a menu level and move within menu.
- 3 **Smart LCD Display** - Backlit for easy viewing.
- 4 **Menu Control Buttons** - Easy navigation through menu.
- 5 **5VDC Out** - Used to power up external NiTRO comrad™ with DC to DC Cable.
- 6 **USB A** - Connect external comrad™ to USB port to download video files or connect USB to Ethernet adaptor and crossover cable to connect PC or laptop.
- 7 **comrad™ Temp LED** - comrad™ temperature indicator.
- 8 **comrad™ Power LED** - comrad™ power status.



The NiTRO™ System is not compatible with GSX System. Do not plug the GSX comrad™ into the front of the NiTRO™ System or plug the NiTRO™ comrad™ into the front of the GSX System either physically or by USB.

Troubleshooting.

When I turn on the Bus, my recorder won't power up or my recorder powers up and then shuts down every couple of minutes. Why is this?

- Ensure that the Sensor harness is connected correctly
- Ensure the black Molex is connected to the back of the recorder
- Ensure comrad™ is properly inserted into the NiTRO™ Control unit

My camera shows an upside down image:

- The camera is meant to be mounted to the ceiling. If the camera is mounted right side up, or sideways, the preview will show an image that is rotated.
- Rotate the lens by removing the two large screws on the camera bracket, rotating the camera bracket 180° and then screwing it back on.

When I view video, there is only a black screen:

- Make sure all camera harnesses are connected to the video in ports on the back of the recorder and/or camera.
- If you have added or removed cameras and have not changed the configuration, you may not be able to capture video.

I have connected a monitor to my recorder, yet there is nothing on the screen of the monitor. Why?

- If the monitor uses an S-video connector, the monitor needs to be connected to the unit prior to starting the unit.

I have MAXVIEW™ open and want to view a video file. How do I do this?

- Click on File > Open.
- Using the drop down menu under "Look in", locate NiTRO™ Videos.
- Double click on 'videos' folder [Select 'clips' folder if applicable].
- Select desired video file(s) to view by clicking with mouse to highlight and then press Open.

Upgrading Software on the NiTRO™ 1000.

To upgrade each recorder, follow the instructions under “Check for Updates” above first to download the upgrade files to a comrad™. Once that is complete follow the instructions below.

- Plug in the comrad™ as an external drive.
- Any upgrades will be automatically copied to the NiTRO™ 1000. The LCD will display “Copying Upgrades” for a moment.
- When the upgrade files are finished copying, shutdown and restart the recorder.
- To verify that the upgrade was successful, go to Configuration >> System >> S/W Version and verify that the number is the same as the upgrade file downloaded.

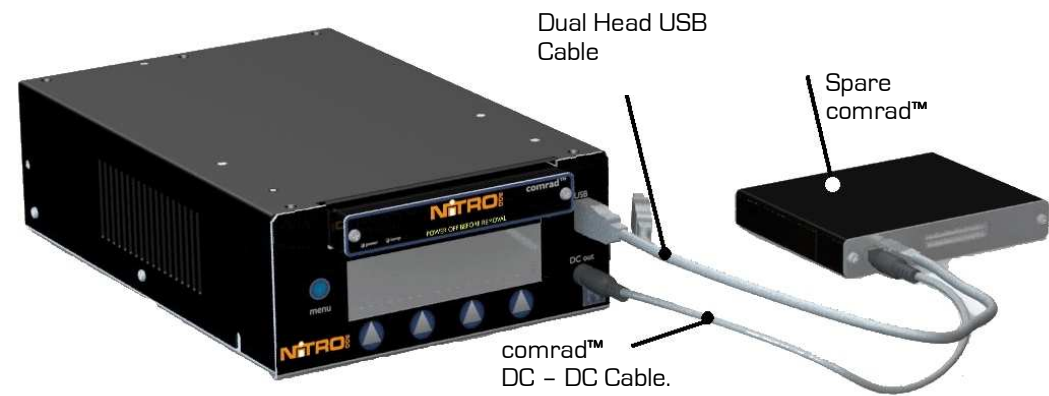


Figure 33: Upgrading Software.



Ensure that the NiTRO™ System has a constant and stable power source. If power is removed from the unit, secure stable power and repeat the process.

Rear Panel.

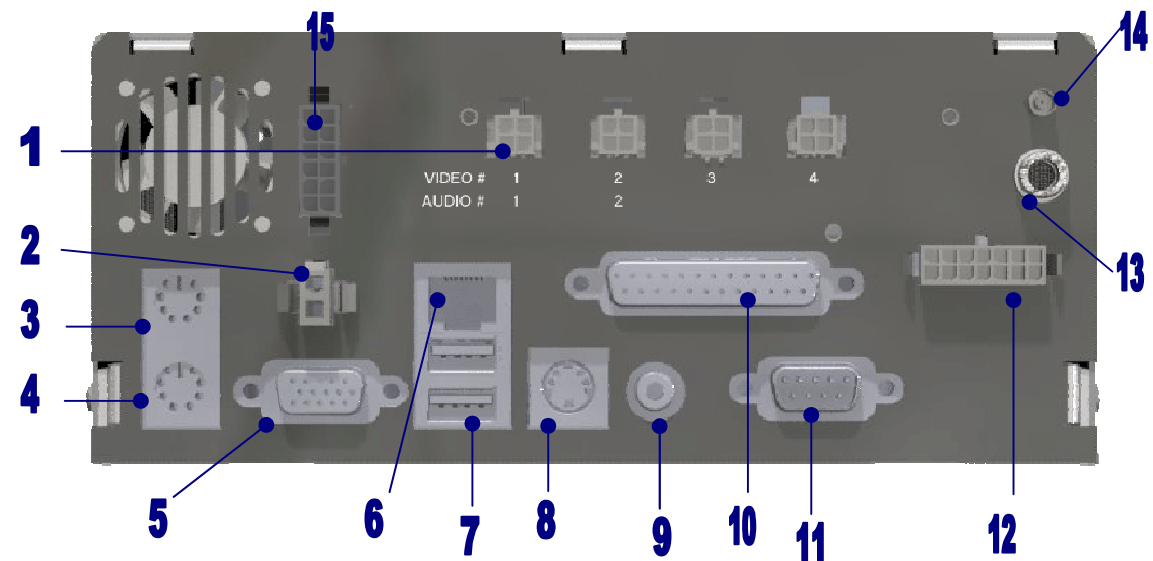
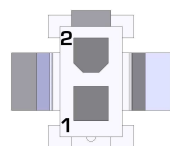


Figure 2: Rear Panel.

- 1 **Video/Audio IN** - 4 Molex camera and audio inputs. Audio is not recorded inputs 3 and 4.
- 2 **2 Pin Molex Connector** - Power input.
- 3 **Mouse Input** - Not Used.
- 4 **Keyboard** - Connect keyboard to navigate through menus instead of menu control buttons.
- 5 **CRT (SVGA)** - Connect computer monitor to view the menu display (alternate output)*.
- 6 **Ethernet Port** - Used to connect recorder to Local Area Network (LAN).
- 7 **USB A** - Connect external comrad™ to USB port to download video files or connect USB to Ethernet adaptor and crossover cable to connect PC or laptop.
- 8 **S-Video Output** - Connect TV to view the menu display (alternate output)*.
- 9 **Video Output** - Connect TV to view the menu display (alternate output)*.
- 10 **Parallel Port** - Not used.
- 11 **DB-9 Port (RS-232)** - Not used.
- 12 **Sensors** - Connect sensor harness.
- 13 **Audio OUT** - RCA audio output can be connected to speakers.
- 14 **GPS Antenna (Build Option)** - A GPS Antenna can be connected so that speed and position can be recorded.
- 15 **Remote Panel (Build Option)** - Remote Panel used for configuration.

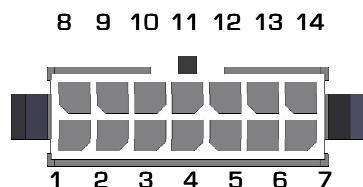
* All three outputs will display the same image with the menu display, any of the three can be used.



PIN	DESCRIPTION	WIRE COLOR
2	GND	Black
1	12V Main	Red

The NiTRO™ System power negative cable should be connected to a solid chassis grounding area.

Figure 3: Power Input – Pin-outs.



PIN	DESCRIPTION	WIRE COLOR 3 Lead ^x	WIRE COLOR 4 Lead ^y	WIRE COLOR 7 Lead ^z	FUSE PANEL CONNECTION
1	Extra 2, User Defined	-	-	Brown	Optional
2	Extra 1, User Defined	-	-	Green	Optional
3	Ignition Trigger	-	-	Red	Connect to Accessory +12V
4	Smart Flag Alarm	-	Black	-	Use for Driver Alarm
5	Alarm LED	-	White	-	Optional
6	GND	Black	-	-	-
7	NC	-	-	-	-
8	Extra 3, User Defined	-	-	Blue	Optional
9	Warning Light Trigger	-	-	White	To Warning Light Circuit
10	Brake Light Trigger	-	-	Orange	To Brake Light Circuit
11	Stop Arm Trigger	-	-	Yellow	To Stop Arm Circuit
12	Record Light Indicator	-	Green	-	Optional
13*	12VDC Output*	Red	Red	-	-
14	Speed Sensor	Green	-	-	Optional

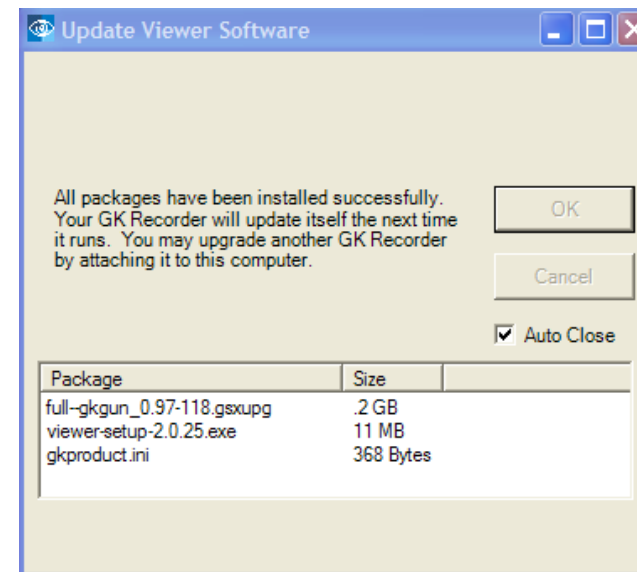
X - Speed Sensor Harness. Y - Alarm & LED Harness Z - Sensor Harness

Figure 4: Sensor Input – Pin-outs.

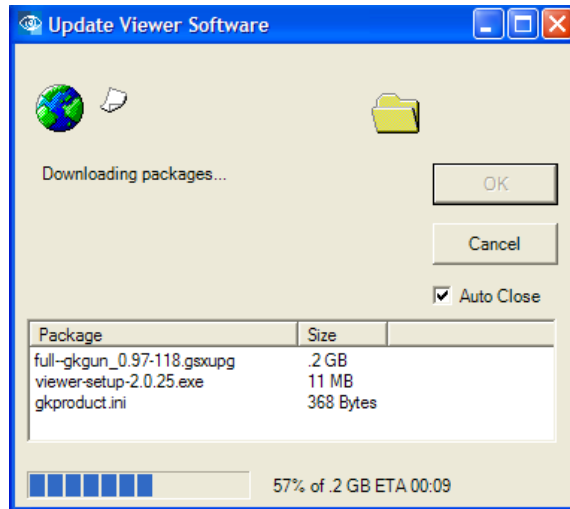
(See Appendix page 78 / 79 for more information)



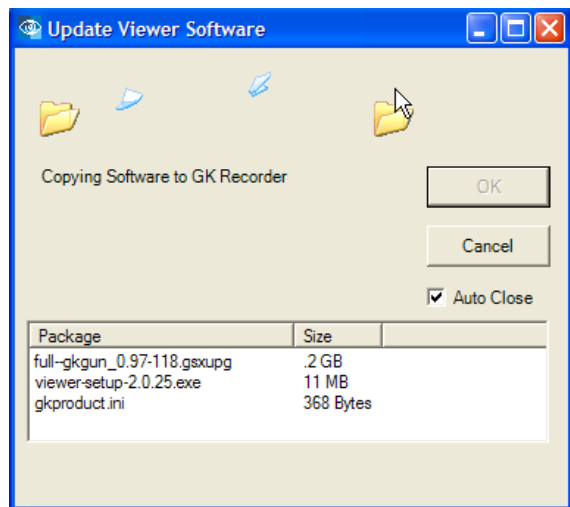
* Never connect to ground.



- comrad™ has been successfully upgraded, you may now update another comrad™ or use this comrad™ to copy upgrade files to another recorder.
- Refer to the Upgrading Software on the NiTRO™ 1000 for details.

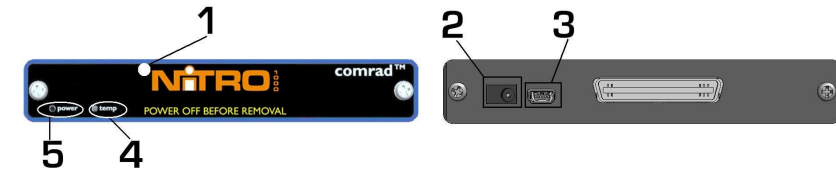


- Files are automatically downloaded to your PC.



- Upgrade files are automatically copied in to the upgrade folder on the comrad™.

comrad™



Front Panel Diagram

Rear Panel Diagram

Figure 5: comrad™ - Front and Rear Panels.

1. comrad™ - Removable hard drive
2. comrad™ Power - Connect power source to comrad™
3. Mini USB - Used to connect comrad™ to PC or externally to NiTRO 1000 as an external drive
4. comrad™ Temp LED - Lit when the NiTRO system is out of temperature range
5. comrad™ Power LED - Lit when the NiTRO system is powered up.



Shutdown the NiTRO™ System prior to removal of the comrad™. Do not remove the comrad™ while the comrad™ Power LED is illuminated.

comrad™ Extraction.



Figure 6: comrad™ Extraction.



If the NiTRO™ System is running, turn system off and wait for the comrad™ LED to go out. Do not remove comrad™ while the NiTRO™ System is running.



Pull firmly on the comrad™ to remove it.



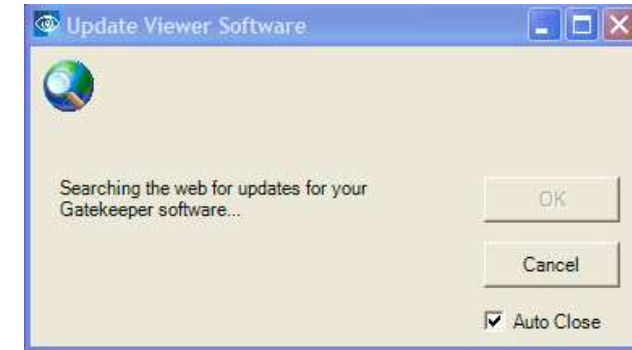
To insert comrad™, ensure it is right side up and in line with the NiTRO™ 1000 Control Unit. Firmly push on front of the comrad™, ensure it is seated properly with a good connection at the back



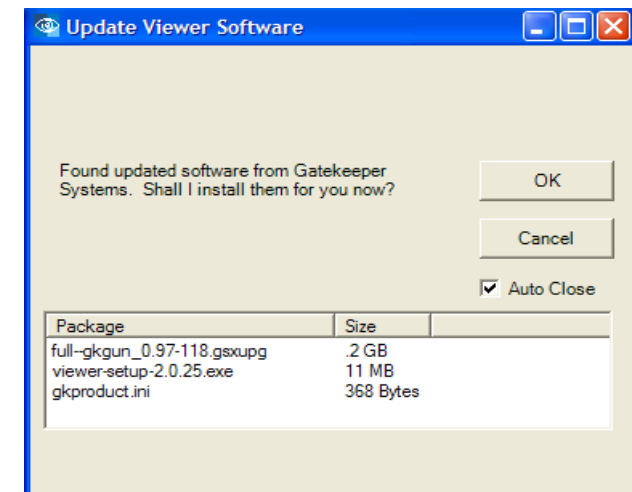
Ensure the NiTRO™ system is off while inserting the comrad™

Check for Updates..

New software updates can be downloaded automatically through MAXVIEW™. All software updates are cumulative. The most recent software update for the recorder will incorporate any changes introduced by previous versions.

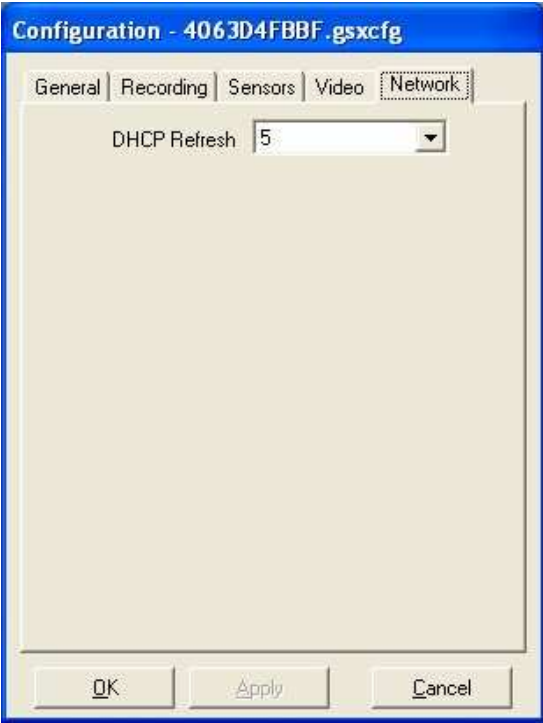


- Make sure that the computer has an internet connection.
- Do not start MAXVIEW™ manually (Using Desktop Icon).
- Plug the comrad™ into your computer through the USB port. See comrad™ only to Computer section for more details. MAXVIEW™ will automatically Open and start running.
- Choose File... Check for Updates.



- Press OK to download updates to the comrad™.

Network Configuration.



In Network Configuration you can assign a time interval, between 5 minutes and 30 minutes, for the DHCP Refresh rate.

Saving Configuration.

Save the new configuration file on to the comrad™ in the Config folder. In this case, the file will be saved as "4063D4FBBF".

Loading Configuration on Recorder.

After you have saved the configuration you must load it if you wish the ID to become active.

- Power up the recorder and Go to Configuration, press Go → Basic →Go.
- Next choose Load ID and press Go.
- Use the + and – signs to scroll to the desired configuration file.
- Finally press the blue menu button to load.

All files recorded from this point forward will use this configuration.

Installation.



Always refer to your applicable Vehicle Safety Regulations before mounting any hardware.

Ten Steps for Installers

- Preferred location for the NiTRO™ 1000 system is either on, or, inside the bulkhead, (see Figure 7).
- Locate a site for the camera(s), (see Figures 13, 14 and 15).
- Locate a site for the GPS Antenna (optional).
- Locate a site for the IR Illuminator, (optional), on driver side of front camera.
- Locate site for all other accessories, i.e. Alarm Button, Record LED (optional).
- Mount the Isolation Suspension System Plate.
- Run Power harness to destination.
- Connect the constant power on the power harness to the Bus battery.
- Run the camera harness(es) to the camera destination(s).
- Run the Sensor harness to the destination.



Installers should refer to the individual product installation sheets that are included for each part listed below:

Camera(s)	Power Harness
GPS	Camera Harness(es)
All Accessories	

Suggested System Locations.

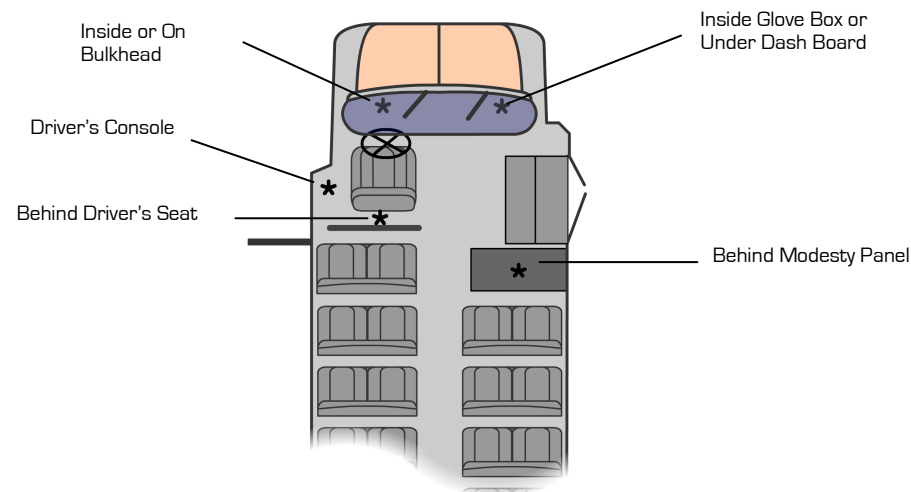


Figure 7: Recommended System Locations

Mounting the System.



- Always use 'star' washers with fasteners, Use nuts and bolts whenever possible.
- Apply even torque to fasteners to avoid distorting the Mounting Plate.
- Remember to leave enough space around the front of the NiTRO™ System so the door can be easily installed, accessed, locked, and that the comrad™ can slide out freely.
- When bolting the Mounting Plate through a sheet metal surface, use 'fender' washers on the back of the sheet metal to help spread the torque load.
- Route the power harness, camera harness(es), and accessory harness(es) through the Rear Door to the installation destination(s).
- Leave enough cable slack at the Rear End Cap, 12 inches.

Check for:

Safety

- Not blocking passenger or driver access.
- Not obstructing driver's view.
- Will not snag loose clothing or carry-on items.



Accessibility

- To the NiTRO™ 1000 front panel for configuring & downloading

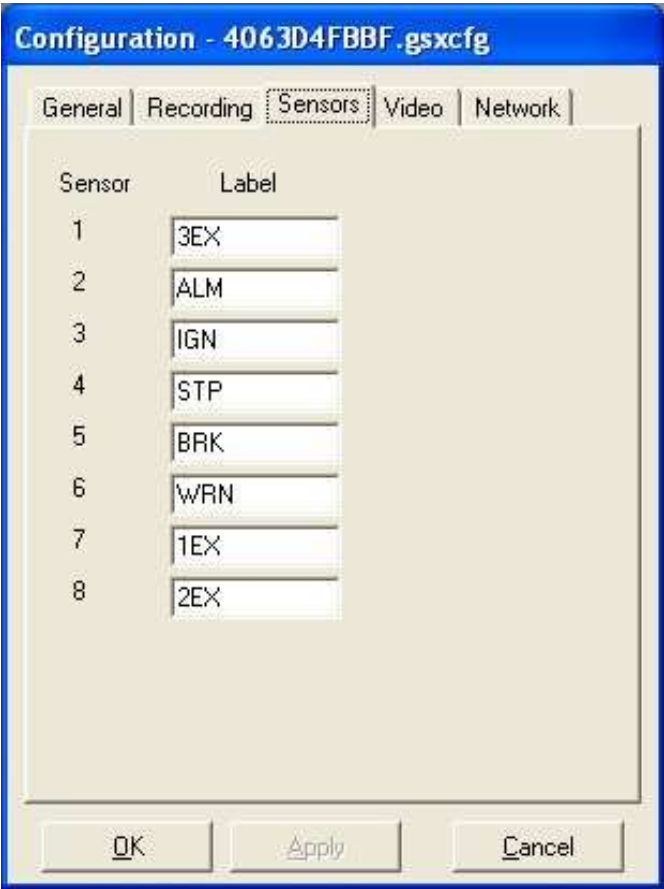
Video Configuration.



In the Video Screen, the following options are available for customization:

- Record Quality
- Frames Per Second
- Video Standard
- Video Resolution
- Subtitle Position

Sensor Configuration.



You can change the name of each sensor from the default name.

Please remember that the Alarm Button is connected to sensor 2 (ALM)

- For easy comrad™ removal and insertion.
- For easy harness routing and connecting.



Reliability

- Away from dirt, heat, and moisture.
- Ensure sufficient airflow for enclosure fan and vents.
- Solid/Flat mounting surface, away from two way radio and vents.

Recommended Location for the IR Illuminator.



- Be sure to stagger the IR relevant to the front camera so as to allow easier access to the camera dome screws and IR Illuminator screws.
- Generally at the front of the Bus to the drivers side of the front camera, as close to the center as possible.
- Avoid areas where artificial light may cause “confusion” for the IR Illuminator which will affect the proper function of the Illuminator.
- Position the IR Illuminator so that there is an unobstructed view to the back of the bus. Illuminator should be aimed towards the Emergency Exit sign at the back of the bus.
- Bracket must be securely fastened to the ceiling or bulkhead.
- Power connector should be inside bulkhead or pushed into ceiling cavity, (CAB000085).
- Ensure minimal exposure of the harness.



Figure 8: IR20, Camera Location and Wiring.

Recommended Location for Alarm Button.



- Generally mounted in a location that is within reach of the driver where the drivers hand will naturally fall into place.
- Recommended location is towards the front of the left switch panel.

Alarm Button connections.

- Red lead(5) is connected to Red lead (12v) from Alarm Harness(8) with Red lead(3) from Record LED.
- Black lead(6) is connected to Black lead(7) on the 4 conductor cable on the Sensor Harness(11).

Recommended Location for Record LED.



- Generally mounted out of the drivers line of sight as to avoid any distractions to the driver.
- Recommended location is towards the rear of the left side switch panel.

Record LED connections.

- Red lead(3) is connected to Red 12V lead in Alarm Harness(8) with Red lead(5) from Alarm Button.
- White lead(4) is connected to Green lead(9) on the Four conductor cable on the Sensor Harness(11).

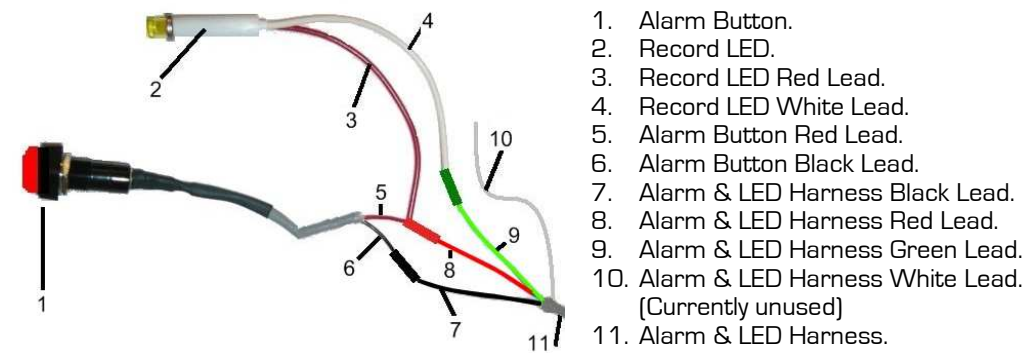
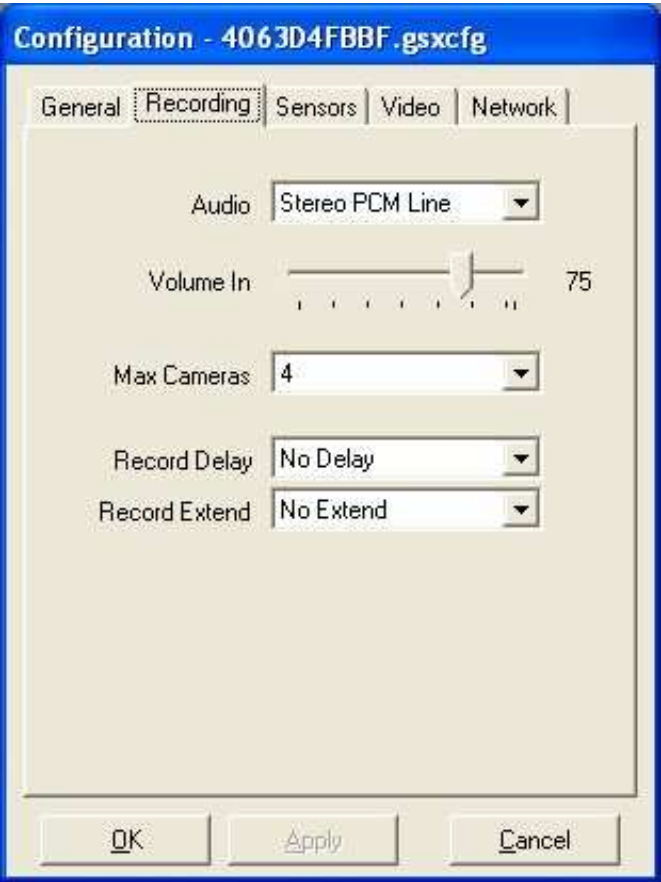


Figure 9: Alarm Button/Record LED Splice.

Recording Configuration.



In the Recording Tab set the following configurations:

- Audio
- Volume In
- Max Cameras
- Record Delay
- Record Extend

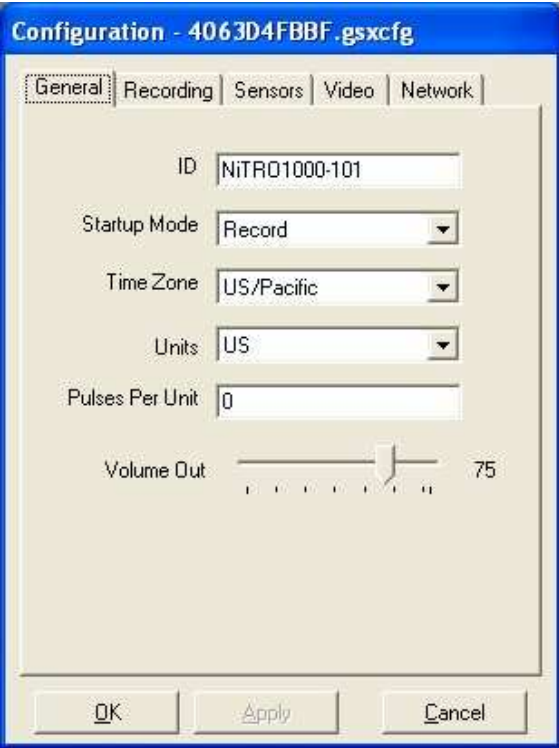
Setting the Recorder Configuration.

You can set up the recorder configuration using MAXVIEW™ rather than the LCD screen. To open the configuration menu first Double-click on the file located in the configuration list.

- ➡ Please remember that if you change the number of camera's; Resolution or Video Standard, you will have to reset the FPS and the Video Quality back to there desired settings as they will have been reset to defaults.
- ➡ The filename is the ID name and by default is the factory serial number. Each ID that has been set will be listed in the Configuration list.

For details on any of the configuration settings, refer to Setting the Configuration section starting on page 25.

General Configuration.



In this screen you set the following configurations:

- ID
- Startup Mode
- Time Zone
- Units
- Pulses Per Unit
- Volume Out

Routing the Power Harness.



- Constant Power connection MUST ALWAYS be made directly to battery.
 - **NOTE:** On rear engine buses, an alternative 12V source in the power distribution panel can be utilized. However, connection will vary from installation to installation.
 - Always use grommets when running the harness through sheet metal holes.
 - Avoid excessively tight bends especially around metal surfaces.
 - Use fuse holder and the 15Amp fuse provided on the 12V+ connection (do not exceed 15Amp fuse).
 - Connect fuse as close to power source as possible.
 - Use cable ties to secure harness and fuse holder.
 - Use correct terminal size for wire gauge.
- 10-12 AWG = Yellow
14-16 AWG = Blue
18-22 AWG = Red



Use ratcheting crimpers for terminal installation.

If grounding to a painted surface, scrape off paint and use 'star' washer between terminal and metal surface.

DO NOT use painted or anodized fasteners.

Before connecting constant power, cut off excess slack.

Before connecting power directly at battery, verify that the system maintains a minimum of 10Volts during engine cranking. Testing requires starting the bus, with a multi-meter connected to battery. Confirm voltage does not drop below 10V during cranking. If voltage drops, advise mechanic at bus garage that the batteries may need to be replaced.

Routing the Camera Harness(es).

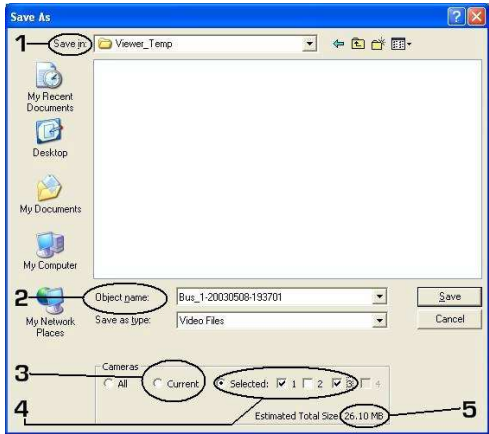


- Route the camera harness(es) and accessory harness(es) with labeled end at NiTRO™ connections.
- Always use grommets when running the harness through sheet metal holes.
- Avoid excessively tight bends especially around metal surfaces..
- Coil and tie off excess harness in a safe place.

Routing the Sensor Harness.



- Route the Ignition Lead (Red) to Accessory 12V+, directly to the steering column, fusebox, or, to the secondary side of the solenoid.
- Always use grommets when running the harness through sheet metal holes.
- Avoid excessively tight bends especially around metal surfaces.
- All unused sensor/indicator wires should be tied off and protected from touching ground.
- Coil and tie off excess harness in a safe place.
- Refer to the Sensor Pin-out diagram on Page 11 Figure 4 for connection pin-outs.



1. Ensure that you know where the file is being saved to, this will help with retrieval later.
2. The object name is typically the bus ID followed by the date and time.
3. By default, MAXVIEW™ will save just the current camera image being viewed.
4. In this example we are going to choose Selected and select camera 1 and 3.
5. Here you see the estimated size of the resulting files.

Once options 1, 2 and 4 are set, click on Save.

Figure 32: Save Video Clip Options Window.



In the folder you have just saved the clip to, you will typically see three file types; .AVI; .DB; .SMI. The AVI file is the actual video file and is playable on any Windows based system, (with suitable CODEC installed), the DB file contains the Sensor information and the SMI file is used by MAXVIEW™ for the sub-title information which it displays.

Extracting Still Image.

You can extract a still image (jpeg) using the blue Video Clip Graph, this process is very similar to saving a video clip.

1. Pause Video at the point where you want to extract an image.
2. Right-click on the Video Clip Graph and choose "Save still image" or "Email still image".
3. Or choose File, Save> Still image.
4. This will bring up, in the case of Save Still Image, a standard Save As... Windows dialog box.
5. By default, the file name will be the ID followed by a hyphen followed by Year; Month; Day, e.g. 1234-20091101.jpg. (.JPG is a standard graphic file extension viewable on all computers.)

1. Choose Edit.
2. Choose Options.
3. Put a check in the box "Ignore sensors when loading video".
4. Press Apply.
5. Press Ok.



If you find that none of your sensor icons are appearing on the blue bar, make sure that the icons are checked off to appear. To confirm, go to Edit >> Options and make sure the icon boxes are checked.

Drag and Drop a Video File.

You can drag and drop an entire video file into another location, ie: Desktop. To do this Left-click on video file in the Video File and Clip list. Next Drag to your desktop and finally Release the mouse button.

Mark & Save a Video Clip.

There are two ways in which you can Save a video clip, one using the right-mouse button and the other method uses the File Menu. Both methods use the same steps to first mark the video you wish to take a clip of:

1. Pause the video at beginning of the clip you want to save.
2. Left-click on the Video Clip Graph where the yellow cursor is located.
3. Drag mouse to the right, the graph will be highlighted in green.
4. Release mouse at end point.
5. Right-click on graph, choose Save Clip or Email Clip, or choose File, Save>Video Clip.



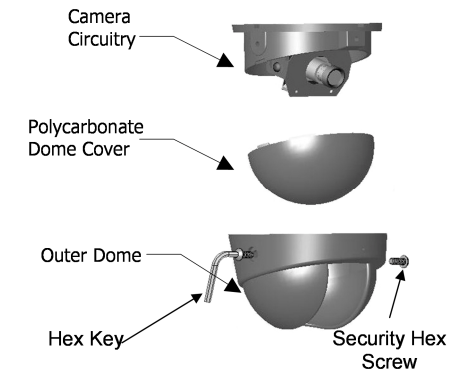
1. Selected video clip to save.
2. Right click with mouse, or go to the file menu, to Save or Email video clip or still image.
3. Gives information of clip length and expected file size.

Figure 31: Mark and Save Clips.

Once you have selected the clip which you require, a new pop-up window will appear. This is the Save As dialog box, enter all the relevant information and make your choices, and then Save.

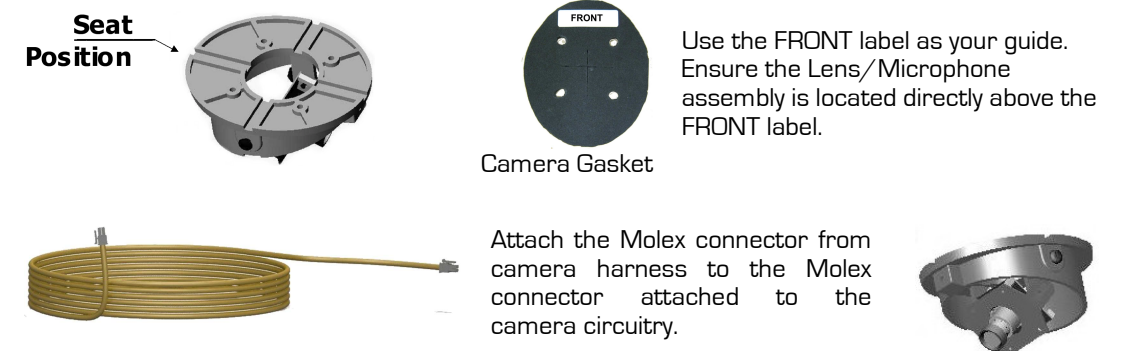
Installing the Dome Camera.

With the introduction of the D1 resolution setting, it is important to note that incorrect configuration of the number of cameras connected will possibly lead to NO video images being captured. If, for example, you do a fresh install with two cameras connected and then at a later date add a third camera, this would equate to an incorrect configuration and as such may result in no video images being captured. If the number of cameras connected to the NiTRO™ 1000 unit changes it will be necessary to access the Advanced Menu, (Page 30), and set the number of cameras first, then the FPS and Record Quality will have to be re-assigned as they will have been reset to default values with the change in the number of camera's connected.



Disassemble the dome camera by removing the outer polycarbonate dome. Loosen Phillips screws to allow camera board to move freely.

Ensure the included gasket is in place between dome baseplate and mounting surface. This gasket is required as it acts as a cushion to absorb vibration and aid in elimination of wind noise from the roof of the bus. Determine seat position for camera harness and insert camera harness into seat position, as shown below.



If mounting to Bulkhead of the bus follow 'Bulkhead Mount' instructions on the following page. Tuck attached camera harness behind the camera circuitry and then mount base with the four screws supplied (Figure 10, Page 22). Focus camera by referring to 'Focusing Camera Lens' on the following page. After final check re-attach Polycarbonate dome cover and outer dome with hex screws.



Do not clean Polycarbonate dome with any agents.

Bulkhead Mount.

- Remove the two bracket mounting screws.
- Rotate camera mount 180° [upside down] and reattach to base plate.

Return to step 4 of 'Installing the Dome Camera'

- **Ceiling Mount** - Microphone should be situated facing back of bus
- **Bulkhead Mount** - Microphone should be situated facing floor.

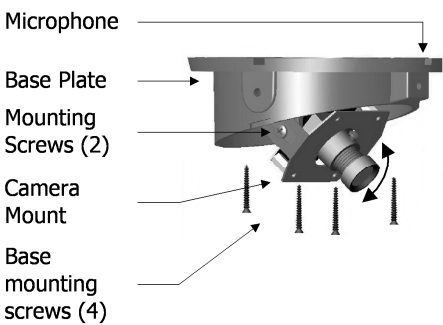


Figure 10: Ceiling Mounting the Camera.

Focusing Camera Lens.

- Connect camera harness input to the back of the NiTRO™ 1000 and power up NiTRO™ 1000 system.
- Remove the Polycarbonate Dome cover and outer dome.
- Connect the 'second video cable' (CAMWHAVIDEOCABLE) to the pin connector on the camera board and then to the video input on a monitor a live video image will display on screen to allow for easy lens adjustment.

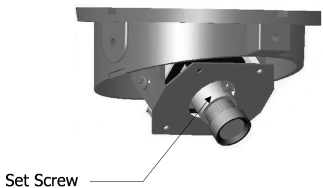


Figure 11: Focusing The Camera

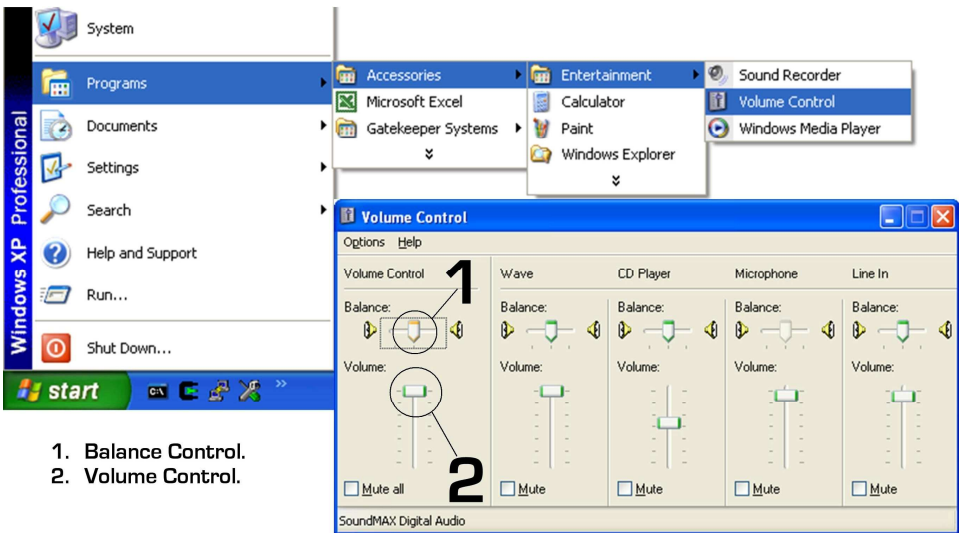
- Loosen the small set screw that is located on the base of the lens.
- Turn the lens slightly clockwise or counter clockwise until desired focus is reached.
- Tighten set screw to lock focus in place.
Be sure to test the focus of the camera with the Polycarbonate Dome in front of the lens before making final adjustment. Some cameras may be slightly out of focus when the Polycarbonate cover is put back on. Should this occur, simply loosen the set screw on the lens, turn the lens 1/8 of a turn counter clockwise and tighten screw.

Audio Controls.

You can turn Audio on/off by clicking the Speaker Icon, [1], located in the Video Control Panel. There may be a slight time delay of 2-3 seconds before audio is muted or audible.



Using the Balance control in the Windows Volume Control, located in "Start Menu > Programs > Accessories > Entertainment > Volume Control", you can control how loud each audio channel is. This is useful if, for example, the sound from one camera is so loud that the sound from the other camera can't be heard.



1. Balance Control.
2. Volume Control.

Displaying Sensors.

You can choose to have sensors appear in the Video Clip Graph at the time they were triggered.

1. Choose Edit.
2. Choose Options.
3. Place a check in the box for each trigger you want to appear on the Video Clip Graph.
4. Press Apply.
5. Press Ok.



1. Click on any Sensor to move to that point in the video
2. Click on any Sensor to move to that point in the video.

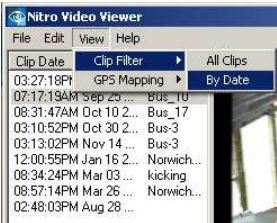
You can choose to ignore all sensors when loading video. If you choose this option, the next time MAXVIEW™ is loaded, the sensor list will appear empty. Doing this may decrease the amount of time it takes to load video files.

With the playback video still paused, if you left click again in a different position along the Time Graph the Vehicle Locator will move to the corresponding GPS data co-ordinates, there will be a one or two second delay for the Vehicle Locator position to be updated.



Using The Calendar Feature.

With MAXVIEW™ you can use a calendar feature to choose which date/time video clip you wish to view. This feature offers a distinct advantage when you are trying to find a specific incident which has been reported.



When using MAXVIEW™ choose the View Menu and from there select Clip Filter and finally By Date.



The Calendar window can be broken down into three major parts:

1. The date of the current video being displayed in MAXVIEW™.
2. The Dates in **BOLD** reflect the dates for which there is captured video and which can be chosen as the selected view. Click on the date required to load video from that date.
3. In this section there is a breakdown of the video information, such as, Time; Date; Bus ID, etc.

Figure 30: Calendar Feature

Playback Speed.



1. Slider Bar, drag with mouse to move backwards and forwards.
2. Speaker, use to mute sound. There may be a slight delay before sound is actually muted.
3. Adjust Playback Speed, (you will only hear audio when slider is set to 1).

Adjusting the Field of View.

Adjust field of view by loosening the bracket mounting screws and rotating the camera mount bracket. Ensure limited ceiling is seen in camera image.



It is best to attach a TV monitor to the NiTRO™ 1000 to capture the desired field of view of the camera, at the same time the lens focus can be checked (see Lens Setup under Configuration, Basic Menu).

Changing Camera Lens.

- Remove Outer Dome Cover and Polycarbonate Dome by removing the two hex screws with the supplied Hex Key.
- Remove lens by loosening set screw, then turning lens counter clockwise, replace with new lens (Figure 12).
- Focus Camera as per 'Focusing Camera Lens' instruction on the previous page.

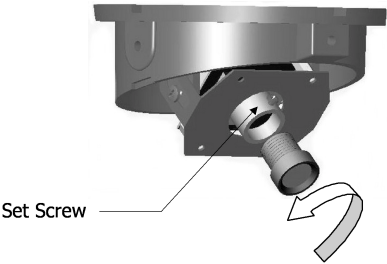


Figure 12: Changing Camera Lens

Recommended Camera Locations.

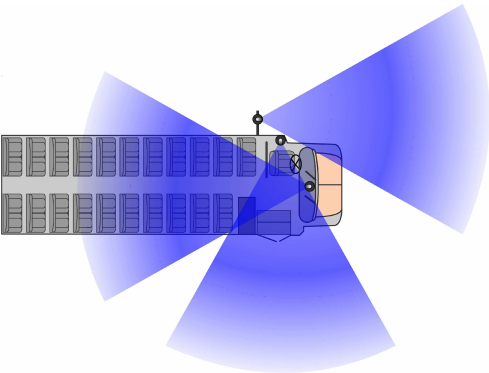


Figure 13: Three Camera Configuration.

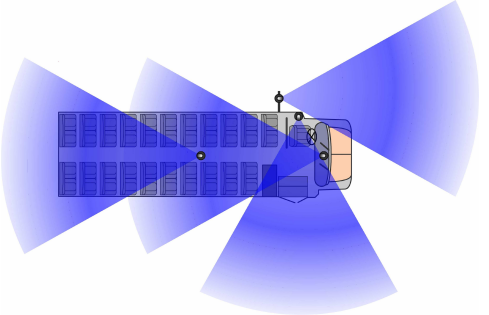


Figure 14: Four Camera Configuration.

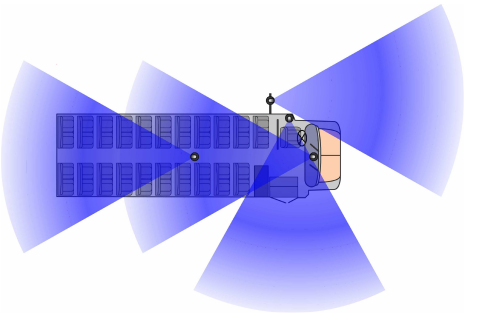


Figure 15: Alternate Four Camera Configuration.

Check For:

- Ceiling mount recommended.
- Do not obstruct walkways.
- Avoid contact with abrasive metal to prevent short circuits.

Wire Routing:

- Camera harness to be connected through opening in base.
- Use existing wire paths wherever possible (ie: radio, speakers, etc).
- Avoid excessively tight bends especially around metal surfaces.
- Always use grommets when routing through sheet metal holes.
- Coil and tie off excess harness or tuck up into ceiling.

Using The GPS Zoom Feature.



When viewing the Vehicle Locator if you wish to zoom-in there are two ways with which to achieve this:

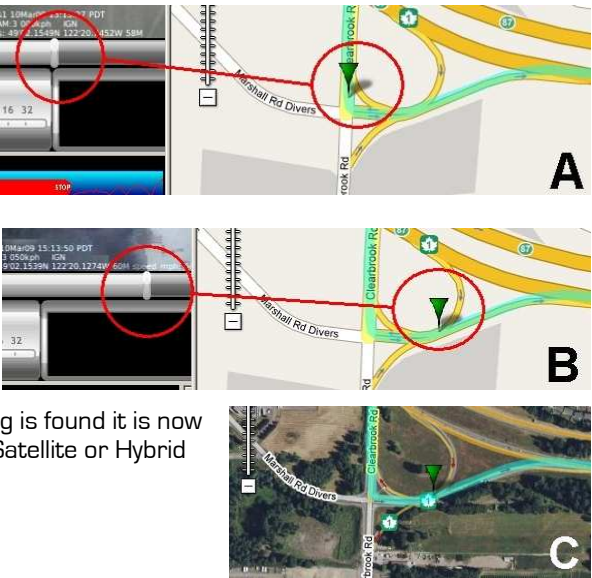
- 1) Use the Slider control to the left of the GPS Mapping Window.
- 2) Place the cursor towards the Vehicle Locator and when it changes to the GRAB hand, double- click with the left mouse button. This will auto-zoom in on the image. Continue to do this until the required level of zoom is achieved.

Continued usage will determine which method you personally prefer.

Using The Scrubber.

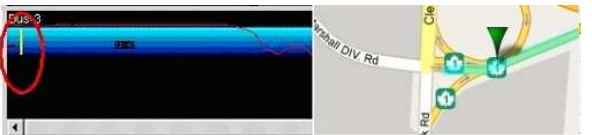
When searching for a specific incident reported during the run of the vehicle a useful tool to become familiar with is the Scrubber. The Scrubber is the vertical bar located in MAXVIEW™ on the grey bar below the actual video display area.

Once playback is paused (graphic A above right) the Vehicle Locator will be displayed within MAP view. If you now move the Scrubber horizontally the Vehicle Locator will change its relevant position on the map, matching the GPS co-ordinates displayed in MAXVIEW™ (see graphic B). Once the required positioning is found it is now possible to change the GPS Data window to Satellite or Hybrid mode if required (graphic C on the right).



Time Graph Selection.

Another option for viewing GPS location data is to use the Blue Time Graph bar within MAXVIEW™. With playback video paused single-left click on the Time Graph and the Vehicle Locator will appear in the GPS Data window.



As can be seen in Figure 27 there are three views which can be chosen.

Default is the MAP view, this default option cannot be changed. To view Hybrid or Satellite images, click on the name in the top right-hand corner of the Map window. The Vehicle Locator is shown as an inverted Green triangle. The Vehicle Locator will only display when enabled and when video playback is paused. When you press the Play button, the Vehicle Locator will be removed from the map until video playback is paused again."

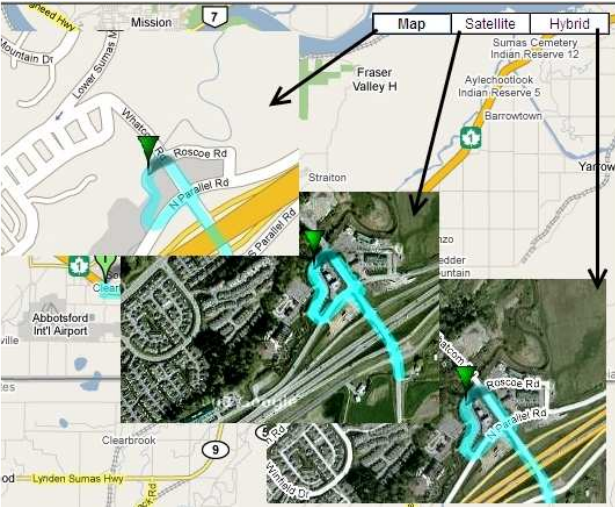


Figure 27: Composite of Map; Satellite and Hybrid Views.



Figure 28: Displaying The GPS Map.



Figure 29: Displaying The GPS Vehicle Locator.



If you do not see the vehicle marker please check these potential reasons prior to calling technical support. There is no GPS data at the time when the video is paused; There is GPS data at that time but the signal is too weak to place the marker on the map; The marker is on the map but not on the current visible area of the map; The map window is not open.

With a new install of MAXVIEW™ the default is not to display the GPS map, this is an option which has to be set. In MAXVIEW™ select the View menu, next choose GPS Mapping and then select Show Map (Figure 28). This will bring up the window to the right of the main MAXVIEW™ window. This GPS data mapping window is moveable and resizable.

To view where the vehicle is in relation to the GPS Mapping select the View menu go to GPS Mapping, select Show Vehicle Locator (Figure 29). This will display the inverted Green triangle. If you are unable to see the Green triangle it may be due to a variety of reasons.

Quick Configuration Settings for Installers.

The Configuration menu allows the user the ability to fully customize each system. To access the configuration menu, press and release the Blue menu button to the left of the LCD screen. Press and release this button until the Configuration option appears on the LCD and then press GO using the button below it on the LCD screen. After you have changed a value under a particular menu, you will see a message stating "Saving Config", this message will appear for five seconds. Once completed you will see a second message stating "Config Saved" this will also appear for five seconds. Use the on-screen Right and Left arrows to choose Basic, Advanced or System and then press GO.



The Configuration menu is separated into three sub menus: Basic, Advanced and System. Use the menu control buttons to navigate to BASIC and press GO.



Lens Setup	Can use to aim and focus camera[s].
Set ID	Set as "Bus Number", e.g. Bus 123.
Set Timezone	Scroll to correct timezone for geographic area.
Set Date	Check to make sure date and time are correct.
Record Extend	Determines the number of minutes the system will record after the ignition has been switched off.



Audio If dual audio is required change this setting to Stereo.



Reset Once Quick Configuration is complete, choose the Reset Option and then select VIDEO ONLY. This will ensure that the customer will receive the system without any previous video on their comrad™

? All other settings are set by default; refer to the following pages for details if you wish to configure more settings

Setting the Configuration.

The Configuration menu allows the user the ability to fully customize each system. To access the configuration menu, press and release the Blue menu button to the left of the LCD screen. Press and release this button until the Configuration option appears on the LCD and then press GO using the button below it on the LCD screen. After you have changed a value under a particular menu, you will see a message stating "Saving Config", this message will appear for five seconds. Once completed you will see a second message stating "Config Saved" this will also appear for five seconds. Use the on-screen Right and Left arrows to choose Basic, Advanced or System and then press GO.



For a walkthrough tutorial on how to use the integral LCD menu system, please see the Appendix.

The Configuration menu is separated into three sub menus: Basic, Advanced, and System. Use the menu control buttons to navigate to BASIC and press GO.



Basic Configuration.

There are seven menus under the BASIC sub menu. The menus are defined below. Refer to the following pages for a detailed description of how to use each menu.

LENS SETUP	This menu is a tool for adjusting the camera, focusing the lens or troubleshooting tool.
SET ID	The Set ID menu is used to input each Bus ID (up to 20 characters). This allows for different configurations which will help with the video management of various vehicles.
LOAD ID	The Load ID menu allows you to load different configuration files into the recorder by selecting different IDs that were previously saved.
SET TIMEZONE	The Set Timezone menu is used to set the recorder to the desired timezone. This will automatically account for day light saving time adjustment.
SET DATE	The Set Date menu allows you to set the current time and date.

Operation.

1. Video File List, this is the default view. If you wish to change to Calendar View, see Page 62.
2. To increase the size of the image from one of the other camera's and make it the focus, simply click on the image once.
3. Video Control Panel & Subtitle Display.
4. Configuration List. Double click to setup configuration.
5. Time Graph and Speed Sensor display. Mark and Save video clips.
6. Sensor List.



Figure 26: MAXVIEW™ Operation.

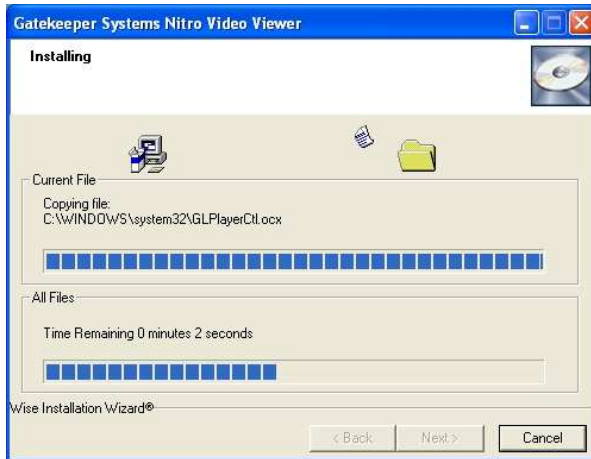
Opening Video Files.

- You can open individual video files in the Viewer.
1. Double click on MAXVIEW™ icon located on your desktop.
 2. Choose File, select Open.
 3. Choose location where files are located.
 4. Select video file(s).
 5. Press Open.

When connecting a comrad™ to your PC via USB, MAXVIEW™ should automatically open and load all videos. If it does not automatically open, browse to the location and double click on the **my.gsx** file. This will open MAXVIEW™ with all video files loaded.

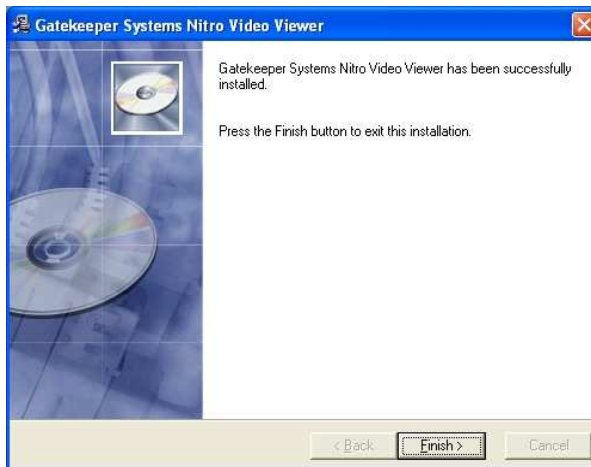
GPS.

Please Note: Only NiTRO™ 1000 systems which had a GPS module fitted at time of manufacture can use this feature of MAXVIEW™. Additionally an active internet connection is required to view the GPS data window.



Installing Files:

We recommend you do not abort installation process after file copying has started.



Installation Complete:

Press Finish to complete installation. You may be required to restart your computer.

Installing MAXVIEW™ will place the following shortcut on your desktop.



RECORD EXTEND

Allows you to adjust the amount of time the recorder will stay powered up and recording after the vehicle's ignition has been turned off.

RECORD DELAY

The Record Delay setting allows you to adjust the amount of time the recorder will wait to record after ignition has been turned on and the recorder has started up.

LENS SETUP

PURPOSE: In order to view the Lens Setup screen, you must have a TV or Monitor connected to either the S-video, RCA video or SVGA output port.

ENTRY: Press 'Go' to enter Lens Setup menu, the screen now displays "Preview" and the current time and date toggle back and forth. A small video window appears on screen for approximately 5 seconds. This video is a pre-recording of the last 5 seconds of video.

EXIT: Press the blue menu button to exit and return to Lens Setup, the video picture will no longer appear on the splash screen.

MESSAGES: If the "No signal" menu appears instead of the date/time, or a black screen appears, this indicates that there is either no camera connected, no signal coming from the camera, or that there is a problem with the video input on the video card.

DEFAULT CONDITION: N/A



We recommend that you connect the camera directly to the TV to view a live video image to focus and aim the camera

SET ID

PURPOSE: Set ID allows for a unique identifier for each video or each video project. Each setting in the configuration menu will be saved under the ID. This unique name will be displayed in the subtitles, in the video file list and in the video file name. All video saved to the hard drive is saved by this ID name.

ENTRY: Press 'Go' to enter the Set ID menu, the current ID is displayed. The blinking number or letter indicates which letter or number is active to be changed. Use the left and right arrow keys to move through the row and use the plus and minus keys to scroll up or down through the alphanumeric list. The ID can be set using UPPERCASE, lowercase alphabet letters,

EXIT: Press the blue menu button to exit Set ID.

numbers 0 through 9, space and dash with a maximum of 20 characters.

OTHER: The default ID will only be displayed if the ID has never been set, if a Reset Config or Reset ALL has been initiated or if the ID has never been changed from default.

DEFAULT CONDITION: Factory Serial Number

LOAD ID

PURPOSE: The Load ID menu allows you to select any ID that you have previously saved on the hard drive. Each time you make an ID, it is saved to the Config folder on the comrad™. Using the Load ID function allows you to select between any ID you have saved by using the plus and minus keys to scroll through the list.

ENTRY: Press 'Go' to enter the Load ID menu, the current ID will be flashing onscreen. Use the plus or minus signs to scroll to another ID. Pressing the blue menu button will load the new ID you have selected.

EXIT: Press the blue menu button to exit Load ID.

OTHER: Remember that only one ID can be saved in the Control unit at one time, but all ID's are saved to the comrad™. Therefore, if you change comrad™, the last ID loaded or activated will still be active when you install a completely different drive. You will also be able to load in any one of the ID's from the new comrad™.

DEFAULT CONDITION: Current ID

SET TIMEZONE

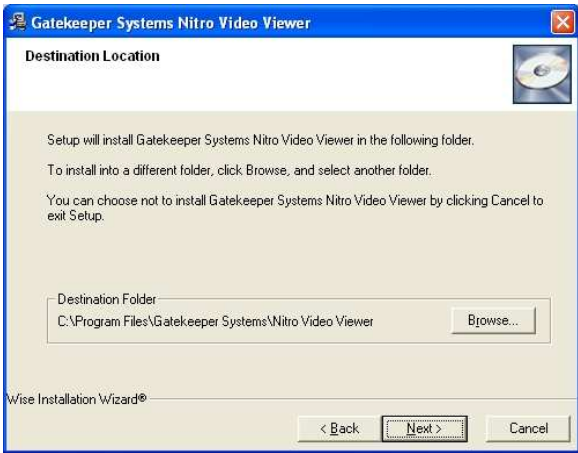
PURPOSE: Set Time zone by geographical area

ENTRY: Press 'Go' to enter the Time Zone menu. The current time zone will be displayed. Most world time zones are included in the list. Use the plus and minus menu buttons to scroll through the list and select desired time zone.

EXIT: Press the blue menu button to exit the Set Time zone menu.

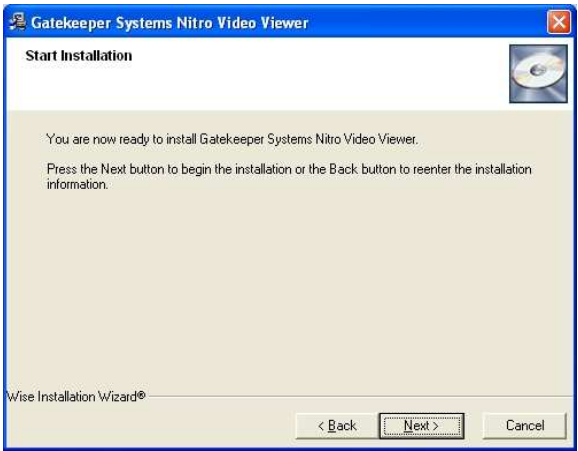
OTHER: When a new time zone is selected compared to the current one, the time on the recorder will change to reflect the new time zone. *Example: Current time zone is US/Pacific and current time is 11:00am. Set new time*

DEFAULT CONDITION: Canada/Pacific



Choose destination folder:

We recommend that the software is installed under Program Files, press Next to proceed.



Start Installation:

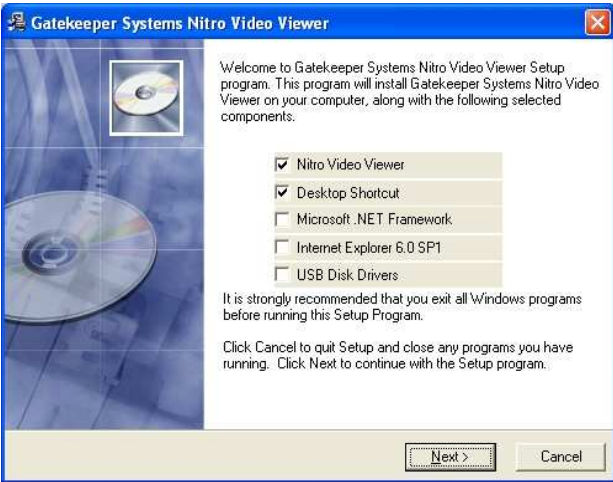
Press Next to proceed.

Connect comrad™ to Computer via USB:



Windows XP.

If the screen to the left does not automatically pop up, browse using Windows Explorer and double click on the removable drive "GSX NITRO Videos" and double click on the **setup.exe** file to begin installation. Refer to page 52.



Installation process:

Software that needs to be installed on your PC will automatically be checked off, press Next to proceed.

zone of US/Eastern and the time will automatically change to 2:00pm or 14:00. If the time is not accurate, the time and date can be set using the Set Date menu. Make sure to set to the correct time zone first before setting the date and time.

SET DATE

PURPOSE: The Set Date menu allows you to set the current time and date for your region.

ENTRY: Press 'Go' to enter the Set Date menu. Use the left and right arrow keys to scroll to each field and the plus and minus signs to increment or decrement each number in the field.

EXIT: Press the blue menu button to exit the Set Date menu.

OTHER: The video file name includes the date and time of the beginning of the file. The recorder files video on a first-in, first-out (FIFO) basis, therefore the oldest video will be the first one overwritten when the disk becomes full.

DEFAULT CONDITION: Last known time

RECORD EXTEND

PURPOSE: The Record Extend setting allows you to adjust the amount of time the recorder will record after the vehicle's ignition has been turned off.

ENTRY: The record extend is set in minutes. Choose from 1, 5-70 (in increments of 5) or No Extend. Use the plus and minus signs to increment the extend time.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to previous menu.

DEFAULT CONDITION: 10 Minutes

RECORD DELAY

PURPOSE: The Record Delay setting allows you to adjust the amount of time the recorder will wait to record after the ignition has been turned on.

ENTRY: The record delay is set in minutes. Choose from No Delay, 1 or 5-70 (in increments of 5). Use the plus and minus signs to increment the delay time.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to previous menu.

DEFAULT CONDITION: No Delay

Use the menu control buttons to navigate to ADVANCED and press GO.



Advanced Configuration.

There are sixteen menus under the ADVANCED sub menu. The menus are defined below. Refer to the following pages for a detailed description of how to use each menu.



STARTUP MODE	The Startup Mode allows the user to configure the system to startup in either Record mode, Playback mode or Standby mode.
SET UNITS	There are two options for the units to be used. The two choices are US (mph) or Metric (kph) .
CALIBRATE TEST	If the recorder is wired to monitor the speed of the vehicle, the pulses per unit need to be calibrated to the speedometer. When the units are calibrated, the speedometer reading will appear on the LCD screen and in the subtitles.
SET PULSES	The Set Pulses menu is used to manually input how many pulses are in one distance unit. This is used if the configuration was reset. As long as the value of pulses is known, the recorder can be re-calibrated without having to redo the entire calibration test. This setting does not apply to GPS speed.
SUBTITLE POSITION	The Subtitle Position allows you to position the subtitle text on the top or bottom of the screen.
AUDIO	Mono/Stereo PCM Audio can be recorded or ignored.
VOLUME IN	This setting determines the microphone audio level input
VOLUME OUT	This setting determines the audio level output
CAMERAS	Configures the system for 1, 2, 3 or 4 cameras.
VIDEO STANDARD	Video Standard selects the appropriate video signal standard to match with the camera signal type, NTSC or PAL.
RESOLUTION	Choose between 720x486 [D1]; 720x243 [2CIF]. Please review this section for available FPS when using multiple cameras at D1 resolution.
RECORD QUALITY	The Record Quality allows you to record using Standard or Special compression.
RECORD FPS	Frames per second relates to the video standard used: In NTSC mode, the FPS is listed as 1, 5, 10, 15, 20, 25, 30. In PAL mode, the FPS is listed as 1, 4, 8, 12,16, 20, 25.

MAXVIEW™.

PC Requirements.



For optimal performance MAXVIEW™ software requires the following minimum requirements to operate on a computer:

COMPONENT	MINIMUM REQUIREMENTS
Operating system	MS Windows XP\ Vista
Processor	Intel\AMD, 2GHz processor
RAM	256 megabytes (MB) or higher
Free hard disk space	1 GB
Monitor	SVGA 1024 x 768 x 32 bit true color NOTE: A horizontal resolution of 1440 is required for use of GPS mapping.
Video Adaptor	3D accelerated graphics processor with 32 MB dedicated video RAM
Connection	USB 1.1, USB 2.0 100 Mbps Ethernet Network Card TCP/IP Protocol

-  For best system performance, we recommend that your PC exceeds these minimum requirements.
-  20GB – 100GB of free space is highly recommended to store video data on the PC.

Installation.

The recorder comes equipped with custom video viewer software (MAXVIEW™) to easily navigate, view and save video files on your PC. To install MAXVIEW™ software on your PC, connect a comrad™ by following the steps under the comrad™ Only to Computer section. Once the comrad™ is connected to your PC, the software installation automatically runs. The installation process is simple and interactive. Follow the directions on each installation screen as it appears to complete the entire installation process.

-  For optimal performance, we recommend that you close all other applications while installing and using MAXVIEW™.
-  MAXVIEW™ might not automatically open in Windows Vista and restricted Windows XP setups.



Recorder to Local Area Network (LAN).

- Connect the Cat5 Ethernet Cable to the Ethernet port on the back of the recorder
- Connect the other end of the Ethernet cable to the office Local Area Connection (LAN).



LED lights adjacent to the Ethernet connector will light yellow or green indicating proper cabling.

- During the detection process there should be a few audible beeps.
- The Local Area Connection is now active

On the front LCD panel of the recorder scroll to **Configuration >> System >> IPO** to locate the IP address. The IP Address should be displayed, e.g. **192.168.0.172** Simply enter two backslashes followed by that address into the address bar in Windows Explorer (e.g. **\\192.168.0.172**).

- 1. Address
- 2. setup.exe

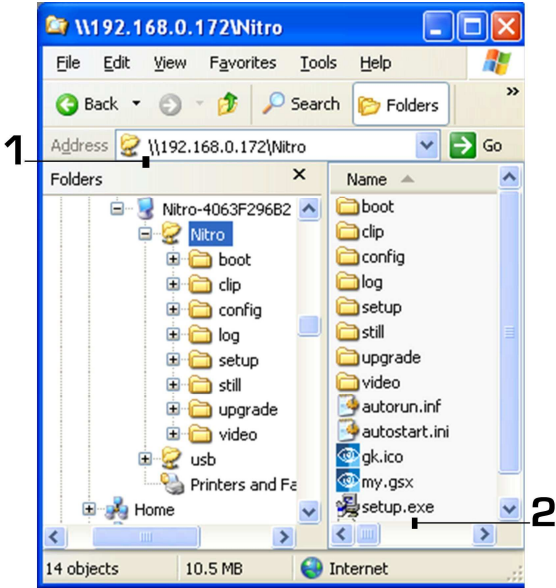


Figure 25: Recorder To Local Area Network.

The \ backslashes are important. There is no "http://", as this is not a web service, but a network share.

SENSOR SETUP

The Sensor Setup menu allows you to configure each sensor name up to 5 characters.

SENSOR READINGS

The Sensor readings menu displays and chooses all sensors that can be displayed in the subtitles.

STARTUP MODE

PURPOSE: The startup mode defines the state the recorder will be in when it has been turned on.

ENTRY: Use the plus and minus signs to scroll through the three options

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue menu button to exit and return to the Advanced sub menu.

OTHER:

- *Record*, the recorder will automatically start recording – if record delay is set to a value other than no delay then it will wait the delay time before recording.
- *Playback*, the recorder will automatically display the playback menu and a video playback window on the video output.
- *Standby*, the recorder will stay on the configuration screen, awaiting some type of action upon startup.

DEFAULT CONDITION: Record

SET UNITS

PURPOSE: The set units menu relates to units of measured speed. There are two options for the units to be used. The two choices are **US** or **Metric**. If US units are chosen, the mph [miles per hour] will be displayed for the measurement of speed. If metric is chosen, then the units are kph [kilometers per hour].

ENTRY: Use the plus and minus signs to toggle between the two options

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue menu button to exit and return to the Advanced sub menu.

DEFAULT CONDITION: US



CALIBRATE TEST

PURPOSE: If the recorder is wired to monitor the speed of the vehicle, the units need to be calibrated to the speedometer. When the units are calibrated, the speedometer reading will appear on the LCD screen and in the subtitles. **If no speedometer is hooked up, then speed will not be displayed on the screen.** Calibration does not need to be done if you are using GPS for speed readings.

- ENTRY:** Press 'Go' to enter the calibrate menu.

 - Press start to begin calibration and start driving one measured mile or km.
 - Press done after traversing one mile (or km) or cancel to stop in the middle of calibration and return to the Calibrate menu.
 - Calibration is complete when Done is pressed; the pulses per unit are shown.
- EXIT:** Press blue menu button to exit and return to the Calibrate Test menu.

OTHER: Whatever units were chosen in the Set Units menu will now be displayed under the calibration. After calibration is complete, the number of pulses is automatically displayed in the Set Pulses menu.

Example: To calibrate the recorder for a vehicle traveling in miles per hour: Press "Start" in the Calibrate Test menu on the recorder, and begin driving on measured mile; when the mile is complete, press "Done". The menu will show how many pulses were in that one mile and that value will be used to calculate the vehicle's velocity when recording.

DEFAULT CONDITION: N/A

SET PULSES

PURPOSE: The Set Pulses menu is used to manually input how many pulses are in one distance unit. This is used if the configuration was reset. As long as the value of pulses is known, the recorder can be re-calibrated without having to redo the entire calibration test.

- ENTRY:** Press 'Go' to enter the set pulses menu.

Use the plus or minus sign keys to increment or decrement each digit. Use the left and right arrow keys to skip to the next digit.
- EXIT:** Press the blue menu button to exit and return to the Set Pulses menu.

OTHER: If the Calibration test was completed, the pulses value will already be set in the Set Pulses menu.

DEFAULT CONDITION: 00000000

Browsing the Recorder on a Computer.

Once the recorder is connected to the laptop or desktop, open Windows Explorer by right clicking with your mouse on the START menu and selecting Explore.

In the address bar type \\ followed by the IP Address 192.168.1.1 and press Enter. To view the IP address go to Configuration >> System >> IP1

1. Address Bar
2. setup.exe

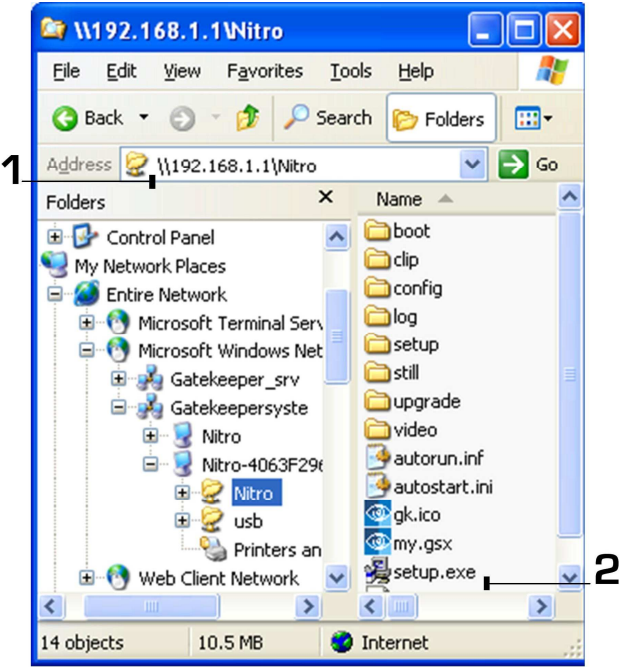


Figure 24: Browsing The Recorder On A Computer.

Once Windows Explorer finds the IP address, double click on the NiTRO folder

- ➔ MAXVIEW™ will not auto start when connecting to the NiTRO™ unit through network share.
- ➔ For first time connection, you will need to install MAXVIEW™ software by double clicking on the setup.exe file. Refer to MAXVIEW™ Installation section for details on installing the viewer





The NiTRO™ unit acts as a DHCP Server through the USB Ethernet. A DHCP Client on the Laptop/PC is required for the Laptop/PC to obtain an IP automatically

- Power up the recorder
- Connect one end of the crossover cable to the laptop Ethernet port.
- Insert the other end of the crossover cable to the USB Adaptor's Ethernet port.



CAT 5 Crossover Cable



USB to Ethernet Adaptor

- Connect the USB Adaptor to the **USB-A** port on the front of the recorder.
- During the detection process there should be three audible beeps.
- The Local Area Connection is now active.

SUBTITLE POSITION

PURPOSE: Subtitle position allows the user to configure the subtitles to appear on the top of the video image or on the bottom of the video image.

ENTRY: Use the plus and minus keys to toggle between **top** and **bottom**

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue menu button to exit and return to the Advanced sub menu.

DEFAULT CONDITION: Bottom

AUDIO

PURPOSE: Audio can be recorded as stereo input or ignored.

ENTRY: Use the plus and minus keys to toggle between the options.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue menu button to exit and return to the Advanced sub menu.

OTHER:

- *None*, the recorder will record video without any audio.
- *Mono PCM Line*: the recorder will record stereo audio from Camera 1 with the video
- *Stereo PCM Line*: the recorder will record stereo audio from Cameras 1 and 2 with the video.

DEFAULT CONDITION: Mono PCM Line

NOTE: When playing a video file from within MAXVIEW™ audio playback will be heard irrespective of which camera is chosen. If a saved video clip is played audio will only be available from either camera 1 or 2.

VOLUME IN

PURPOSE: This setting determines the microphone audio level input as captured during the recording. 0 being the lowest level; 100 being the highest level. When set to 0 the recording will have no audio.

ENTRY: Use the Plus and Minus signs to change the value to the required level.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue menu button to exit and return to the Advanced sub menu.

DEFAULT: 75

VOLUME OUT

PURPOSE: This setting determines the audio level output. 0 being the lowest; 100 being the highest. When set to 0 during playback on the recorder this will act like audio out being muted. There will be no sound coming from the computer on which the video is being reviewed.

ENTRY: Use the Plus and Minus signs to change the value to the required level.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue menu button to exit and return to the Advanced sub menu.

DEFAULT: 75

CAMERAS

PURPOSE: Sets the number of connected cameras, 1, 2, 3 or 4.

ENTRY: Use the plus and minus keys to cycle through 1, 2, 3 and 4.

EXIT: Once correct number of cameras have been selected, use the arrow key to save the configuration.

NOTE: If you add or remove a camera from the system this will directly affect **FPS** and **Record Quality**, both of which will be reset back to defaults.

DEFAULT CONDITION: 4

VIDEO STANDARD

PURPOSE: To select the appropriate video signal standard to match with the camera signal type.

ENTRY: Use the plus and minus keys to toggle between **NTSC** and **PAL**.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue menu button to exit and return to the Advanced sub menu.

NOTE: If this value is changed after configuration this will directly affect **FPS** and **Record Quality**, both of which will be reset back to defaults.

DEFAULT CONDITION: NTSC

RESOLUTION

PURPOSE: Changes the resolution of the captured video, 2CIF is 720x243 and is the default resolution. D1 is 720x486 and a higher resolution but does have an effect on the FPS rate. Please consult the following table to verify the number of Cameras connected and available FPS when D1 resolution is selected.

ENTRY: Use the plus and minus keys to toggle

EXIT: Use the right arrow to advance to the

Manually Installing MAXVIEW™.

MAXVIEW™ will not automatically open in Windows Vista and restricted Windows XP setups when the comrad™ is plugged into the PC. To manually install MAXVIEW™, open Windows Explorer by right clicking with your mouse on the START menu and selecting Explore.

Locate the NiTRO™ comrad™ in Windows Explorer.

1. Address Bar
2. setup.exe

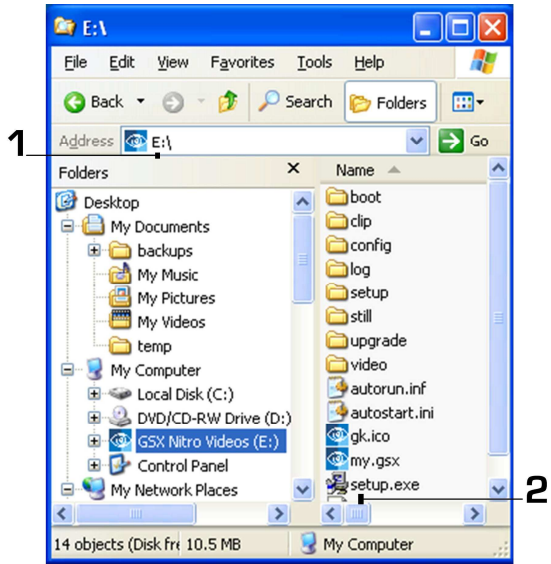


Figure 23: Manually Installing MAXVIEW™.

Once you have located the NiTRO™ comrad™ in Windows Explorer, double click on the NiTRO™ comrad™. Install MAXVIEW™ software by double clicking on the setup.exe file. Refer to MAXVIEW™ Installation section for details on installing MAXVIEW™. When the installation is complete, MAXVIEW™ will automatically open with all video files



For first time connection, you will need to install MAXVIEW™ software by double clicking on the **setup.exe** file. Refer to MAXVIEW™ Installation section for details on installing MAXVIEW™



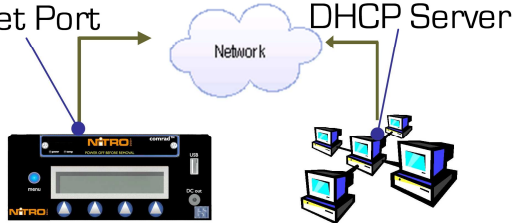
If MAXVIEW™ is installed you can double click **my.gsx** to launch MAXVIEW™ and load all the video files on the comrad™

Connecting the Recorder to Computer WITH USB Ethernet Adapter.

In a Laptop environment (no DHCP LAN services) the recorder will have its own IP Network Address of 192.168.1.1 and it will provide the laptop unit with an IP address of 192.168.1.64. In Windows Explorer, use the address location: \\192.168.1.1 to connect to the recorder. See below for detailed instructions.

Recorder to Local Area Network (LAN).

Connect to rear Ethernet Port



You will need:

- ✓ NitRO™ 1000 Recorder
- ✓ Ethernet Cable
- ✓ LAN connection port

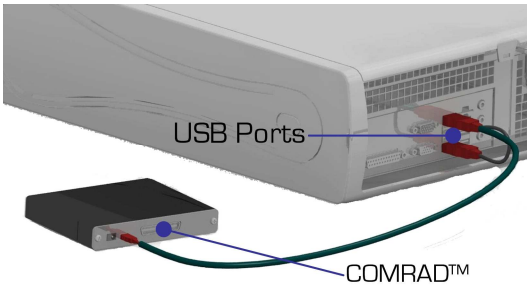


A DHCP Server is required on the Local Area Network for the NitRO™ unit to obtain an IP automatically through the rear Ethernet port.

comrad™ Only to Computer.



Power down the recorder and remove the comrad™ unit by pulling firmly on the front.



Insert both heads of the Dual Head USB Cable into the USB ports on your computer. Connect the mini end of the USB cable into the USB port on the back of the comrad™.



If the Dual Head USB Cable does not provide enough power for the comrad™, also insert the DC plug from the comrad™ Power Supply to the DC Jack (VDC-IN) on the back of the comrad™. Plug the other end of the power supply to a wall outlet.

If the comrad™ is connected to a PC for the first time, it will initiate the MAXVIEW™ Installation. Subsequent connections will automatically open Viewer. Refer to MAXVIEW™ section for details.



MAXVIEW™ will not automatically open in Windows Vista and restricted Windows XP setups. Please see Manually Installing MAXVIEW™ on Page 52.

between D1 and 2CIF.

next option, this will save the configuration change.

NOTE: If this value is changed after configuration this will directly affect **FPS** and **Record Quality**, both of which will be reset back to defaults.

DEFAULT CONDITION: 720x243

Format	Resolution	# Cameras	Frame Rates						
			1	5	10	15	20	25	30
NTSC	D1	1	Y	Y	Y	Y	Y	Y	Y
NTSC	D1	2	Y	Y	Y	Y	Y	Y	-
NTSC	D1	3	Y	Y	Y	Y	Y	-	-
NTSC	D1	4	Y	Y	Y	Y	-	-	-
NTSC	2CIF	1	Y	Y	Y	Y	Y	Y	Y
NTSC	2CIF	2	Y	Y	Y	Y	Y	Y	Y
NTSC	2CIF	3	Y	Y	Y	Y	Y	Y	Y
NTSC	2CIF	4	Y	Y	Y	Y	Y	Y	Y

Format	Resolution	# Cameras	Frame Rates						
			1	4	8	12	16	20	25
PAL	D1	1	Y	Y	Y	Y	Y	Y	Y
PAL	D1	2	Y	Y	Y	Y	Y	-	-
PAL	D1	3	Y	Y	Y	Y	Y	-	-
PAL	D1	4	Y	Y	Y	Y	-	-	-
PAL	2CIF	1	Y	Y	Y	Y	Y	Y	Y
PAL	2CIF	2	Y	Y	Y	Y	Y	Y	Y
PAL	2CIF	3	Y	Y	Y	Y	Y	Y	Y
PAL	2CIF	4	Y	Y	Y	Y	Y	Y	Y

Figure 16: Table of Available Frame Rates.

RECORD QUALITY

PURPOSE: The Record Quality menu gives two options used for recording:

- **Standard – Standard Compression (recommended)**
- **Special – Lower Compression (better image, but larger file size)**

ENTRY: Use the plus and minus keys to toggle between the two options.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue menu button to exit and return to the Advanced sub menu.



If Record Quality is set to Special, you will reduce the total record time.

DEFAULT CONDITION: Standard

RECORD FPS

PURPOSE: The Frames per second options relate to the video standard used.

For NTSC mode, the FPS is listed as **1, 5, 10, 15, 20, 25, 30**

For PAL mode, the FPS is listed as **1, 4, 8, 12, 16, 20, 25** (the Video Standard must be set to PAL first)

ENTRY: Use the plus and minus keys to toggle between the two options

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to previous menu. Press the blue menu button to exit and return to the Advanced sub menu.



Lowering the FPS will increase the record time.

DEFAULT CONDITION: 30

SENSOR SETUP

PURPOSE: There are eight pins on the sensor harness that are used as sensors. Each sensor is displayed on the main recording screen when it becomes active. The character that gets displayed is the first character in the label. Example: IGN is active so "I" is displayed. If the label was changed to "DOOR", the letter "D" would be displayed.

ENTRY: Press 'Go' to enter Sensor Setup menu. Use the plus and minus sign keys to increment each character. Use the left or right arrow keys to jump to the next character and/or field.

EXIT: Press the blue menu button to exit the Sensor Setup menu and return to the Advanced sub menu.

Label: The default names are 3EX, ALM, IGN, STP, BRK, WRN, 1EX, 2EX. Each label can be changed to any 5 characters

Trg: The trigger defines either to trigger on an active high [1] or active low [0].

DEFAULT CONDITION: Sensors with default labels, triggered on active high [1]

SENSOR READINGS

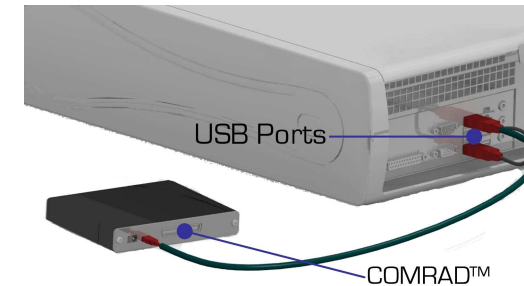
PURPOSE: The Sensor Readings menu displays all sensors that can be displayed in the subtitles. The default sensors are automatically displayed and cannot be turned off—they will always appear in the subtitles when they are active.

Sensor Readings can also be used to test whether sensors are working: 0 is displayed while the current sensor is inactive, and 1 is displayed when the sensor is active.

Downloading Video.

There are several ways to download and view video files from the recorder to your PC. Video can be viewed using MAXVIEW™. The installation for MAXVIEW™ is located on the comrad™, refer to MAXVIEW™ section for instructions.

comrad™ Only to Computer (Recommended).



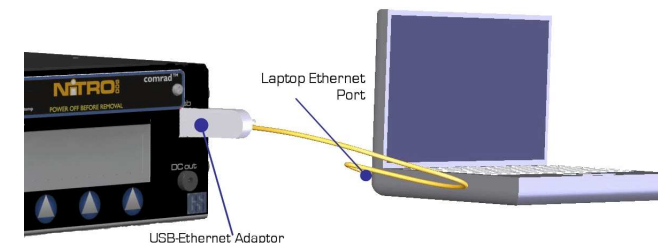
You will need:

- ✓ comrad™
- ✓ Dual Head USB Cable
- ✓ comrad™ Power Supply (optional)
- ✓ PC with two USB ports



Please use both USB Connectors in order to get sufficient power to the NiTRO™ comrad™. If there aren't two USB ports available on the PC, use the comrad™ Power Supply.

Connecting the Recorder to a Computer.



You will need:

- ✓ NiTRO™ 1000 Recorder
- ✓ USB-Ethernet Adaptor
- ✓ Crossover Cable
- ✓ PC with Ethernet port



The NiTRO™ unit acts as a DHCP Server through the USB Ethernet. A DHCP Client on the Laptop/PC is required for the Laptop/PC to obtain an IP automatically.

System Shutdown.

By default, the NiTRO™ 1000 is designed to automatically shutdown once the ignition has been turned off and after the Record Extend time has expired. This only occurs if the Record Extend timer is not cancelled.

To cancel Record Extend, press Cancel when the unit is counting down.

If you have stopped the system from Recording and need to manually shut the system down, follow the directions below.

In order to safely shut down the system, you need to use the shutdown menu.

ENTRY: Press 'Go' to enter the Shutdown menu. **EXIT:** Press blue menu button or Cancel to exit the Shutdown menu. Press Ok to shutdown or Cancel to return to Shutdown menu.

MESSAGES: "Shutting down..." appears when the system is safely shutting down. The system takes roughly 15 seconds to fully power down. Ensure that the ignition is not turned on, or the system may start up again after 5 seconds.



Do not remove the comrad™ from the NiTRO™ 1000 recorder until the system has fully powered down.

T and V are the temperature and voltage of the system and can be turned on or off from being displayed in the subtitles. The GPS is the GPS position of the vehicle, and speed_mph is the speed of the vehicle.

ENTRY: Press 'Go' to enter Sensor Readings menu. Use the left or right arrow keys scroll to the next sensor in the list. The T, V, GPS and speed-mph sensors can be turned off or on. **EXIT:** Press the blue menu button to exit the Sensor Readings menu and return to the Advanced sub menu.

OTHER: The speed units used will be correct according to the units configured in the Set Units menu (ie. if the unit is set to Metric units, the speed will be recorded in kph, even though the sensor label reads speed_mph).

DEFAULT CONDITION: Sensors 1-8 – On, Temp, Voltage, GPS, etc. – Off



Refer to the Sensor Pin-out diagram on page 11, Figure 4, for connection pin-outs.

Use the menu control buttons to navigate to SYSTEM and press GO.



System Configuration.

There are eight menus under the SYSTEM sub menu. The menus are defined below. Refer to the following pages for a detailed description of how to use each menu.

DISK USED	The disk used menu displays the percentage of storage spaced used up on the disk.
SERIAL	The unique serial number of the recorder is displayed. This serial number is also the default ID that is displayed under Set ID.
IP0	When the recorder is connected to a LAN via the back Ethernet port, the IP address of the recorder will be displayed.
IP1	When the recorder is connected to a laptop via the front USB port using the USB to Ethernet adaptor, the IP address 192.168.1.1 will be displayed.
DHCP REFRESH	Utility used to poll the DHCP server.
S/W VERSION	The currently installed software version is displayed.
RESET	To allow the user to reset current setting to defaults, erase all settings, or erase all video.
CLONE	The system clone feature allows the user to recover a hard drive in case of disk corruption.

DISK USED

PURPOSE: The Disk Used menu displays the percentage of storage space used up on the disk.

ENTRY: No entry, data already displayed on screen. **EXIT:** Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue button to return to the System sub menu.

DEFAULT CONDITION: 1%

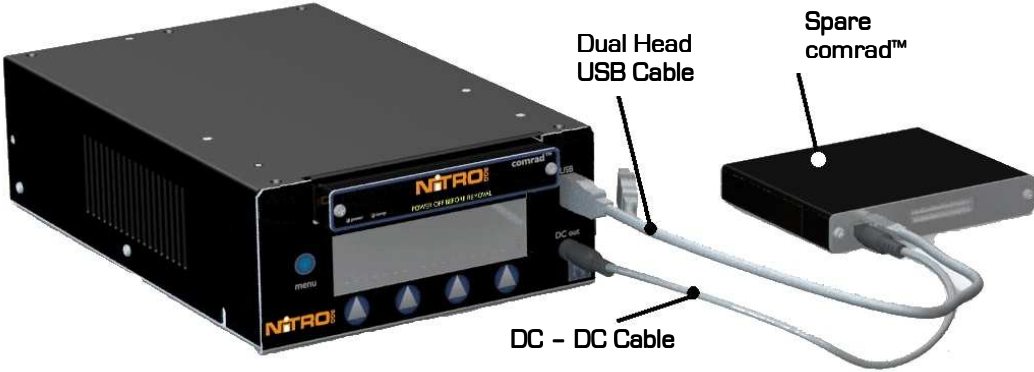


Figure 22: Downloading Clips.

➡ When using the Dual Head USB Cable, ensure that the main head [the one with two wires coming out of it] is plugged into the system.

Or shut the Nitro™ 1000 down and remove the comrad™ to connect it to a PC for downloading video. Refer to Downloading Video section for full details.

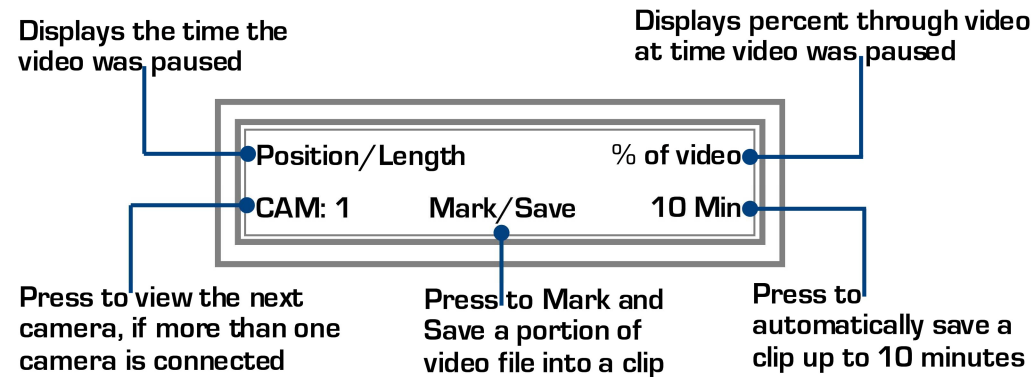


Figure 21: Mark and Save.

Mark & Save.

Mark & Save provides a way for the user to extract a small video clip out of the whole video file.

- 1 Press Pause when you reach the beginning of the clip to be saved.
LCD Screen advances one level.
- 2 Press Mark.
LCD screen goes back one level.
- 3 Press Fwd to reach the end of the clip to be saved, press Pause.
LCD screen advances one level.
- 4 Press Save.
- 5 Press Ok to confirm saving clip or Cancel to abort. The extracted portion of video is stored in the "Clip" section.

Save 10 Minutes.

Save 10 Minutes provides a way for the user to extract a small video clip out of the whole video file. The Save 10 Minutes automatically extracts a clip up to 5 minutes of video before the current position and up to 5 minutes of video after the current position.

- 1 Press Pause when you reach the middle of the clip to be saved.
LCD Screen advances one level.
- 2 Press 10 Min.
- 3 Press Ok to confirm saving clip or Cancel to abort. The extracted portion of video is stored in the "Clip" section.

Once you have saved clips, you can connect a spare comrad™ to the front USB port and the clips will automatically download to the comrad™ and will be stored in the Clip folder.

SERIAL

PURPOSE: The Serial menu displays the unique serial number of the recorder. This serial number is also the default ID that is displayed under Set ID.

ENTRY: No entry, data already displayed on screen.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue button to return to the System sub menu.

DEFAULT CONDITION: The serial number

IPO

PURPOSE: When the recorder is connected to a LAN or a Laptop via the rear Ethernet port, the IP address will be displayed under IPO. This address is used to connect to the recorder over the network.

ENTRY: No entry, data already displayed on screen. An IP address is only displayed if the recorder is attached to a LAN or PC connection.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue button to return to the System sub menu.

OTHER: Refer to IPO when trying to browse the recorder on a Local Area Network (LAN)

DEFAULT CONDITION: Blank



A DHCP Server is required on the Local Area Network for the NiTRO™ unit to obtain an IP automatically through the rear Ethernet port

IP1

PURPOSE: When the recorder is connected to a laptop via the front USB port using the USB to Ethernet adaptor, the IP address 192.168.1.1 will be displayed under IP1. This address is used to connect to the recorder from that laptop.

ENTRY: No entry, data already displayed on screen. The IP address is only displayed if the recorder is connected to a USB to Ethernet adaptor.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue button to return to the System sub menu.

OTHER: When the recorder is connected to a LAN or a Laptop via the back Ethernet port, the dynamic IP address will be displayed under IPO, not IP1.

DEFAULT CONDITION: Blank



The NiTRO unit's USB Ethernet connection acts as a DHCP Server. A DHCP Client on the Laptop/PC is required for the Laptop/PC to obtain an IP automatically.

DHCP REFRESH

PURPOSE: Maintains communication with the DHCP server ensuring that an available IP address, if required, is obtained automatically. Refresh time is configurable from 5 minutes through to and including 30 minutes.

ENTRY: Press 'Go' to enter DHCP Refresh menu. Use the plus and minus sign keys to select the required refresh time.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue button to return to the System sub menu.

DEFAULT CONDITION: 5 minutes.

S/W VERSION

PURPOSE: The S/W Version menu displays the currently installed software version. When the recorder gets a new update via Check for Updates or Upgrades copied from another comrad™ the new version of software can be confirmed here.

ENTRY: No entry, data already displayed on screen.

EXIT: Use the right arrow to advance to the next menu or left arrow to advance to the previous menu. Press the blue button to return to the System sub menu.

PLAYBACK

ENTRY: Press 'Go' to enter the Playback menu. Use the left and right arrow buttons to move between the Search, Date/Time, Alarm and Clip options, then press Go to select that option and start Playback.

MESSAGES: "None Available" appears if there are no video files on the system to play back.

EXIT: Press the blue menu button to exit and return to the main Playback menu. From here, press the STOP button to stop playback. The STOP button only appears when a video is playing.

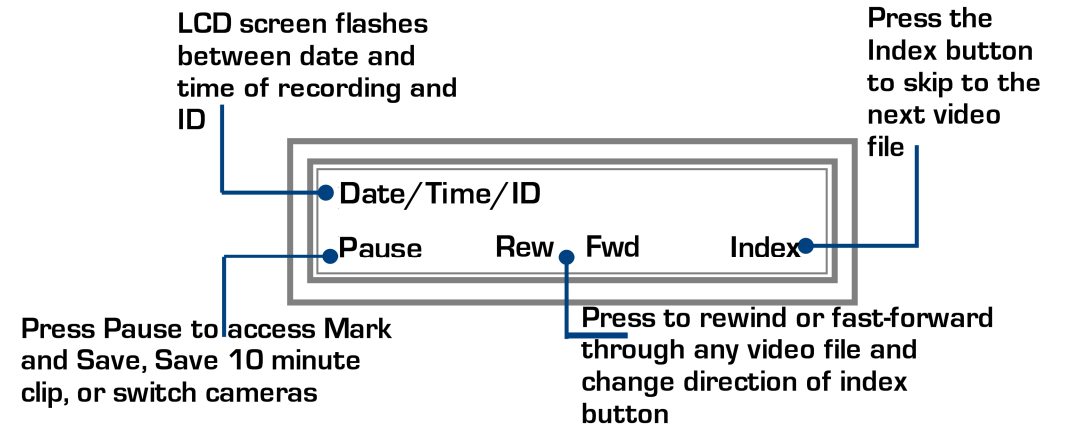


Figure 20: Playback Display.

Rew & Fwd Buttons.

When you press Rew or Fwd once, you will move 10 seconds back or forward. If you hold down Rew or Fwd you will start to rapidly move backwards or forwards through the video. The Rew and Fwd buttons will also change the direction of scrolling through the index. See Index button.

Index Button.

The index button tells you the current file being played out of the total number of video files on the system. Press the index button to move to the beginning of the next video file.

To go backwards or forwards through the index, press the Rew or Fwd button first. The direction of the arrow will change to indicate the direction you will be scrolling through the files.

Playback from Recorder.

The playback menu provides a means for the user to display the video for playback on the recorder through any video output port.

Within the playback menu's one can Mark & Save video and Mark & Save up to 10 minutes of video.

Connect a monitor to the video output port to view video. Refer to Search, Date/Time, Alarms, and Clips for full descriptions of navigation through the functions of the playback menus.

Playback Methods.

The Playback menu offers 4 types of Search methods to play back video files.

Method I: Search	Search videos in chronological order. All videos are indexed by a first-in, first-out method. When entering this menu, the index will indicate current video file out of total video files and the monitor will show the corresponding video to match. Example: If there are 10 video files, the index will show 1>10, 2>10...10>10.
Method II: Date/Time	Input the date and time of the video file you want to watch. Playback skips to the video that is closest to that time. All videos are indexed by a first-in, first-out method.
Method III: Alarm	If the system is configured using "Alarm Button", in this section all video will be indexed by the driver alarm. When entering this menu, the index will indicate current alarm out of total alarms and the monitor will show the corresponding video to match. Example: If the driver alarm has triggered 10 times, the index will show 1>10, 2>10...10>10.
Method IV: Clip	Any clips that have been saved from the Search, Date/Time or Alarms sections will be saved into Clips and can be viewed from this menu. When entering this menu, the index will indicate current clip out of total clips saved and the monitor will show the corresponding video to match. Example: If 10 clips have been saved, the index will show 1>10, 2>10...10>10.

DEFAULT CONDITION: Installed S/W Version

RESET

PURPOSE: The Reset menu allows the user to reset current settings to defaults, erase all videos or erase all videos and reset settings to defaults.

ENTRY: Press 'Go' to enter the Reset menu.

EXIT: Press Cancel or the blue menu button to exit the Reset menu and return to the System sub menu.

OTHER:

Config: This will delete all configuration except the default settings and reset the ID back to the factory serial number

Video: This will completely erase all videos files and clips on the recorder without any option to retrieve them at a later date. The configurations are not changed.

Cancel: This will cancel the reset and exit.

All: This will delete all the config files, returning the unit to factory default. You will be unable to retrieve any IDs and all video will be deleted.



CLONE

PURPOSE: Cloning a hard drive completely formats that drive and copies system files from the recorder. All files that were on the cloned drive will be lost and a fresh system is copied onto it.

PROCEDURE:

- Start a known working system and allow it to go through a full boot cycle.
- Connect the corrupt comrad™ to the front USB port of the recorder via a Dual Head USB 2.0 cable. Apply power to the comrad™ either from the front DC Output with a DC to DC Cable or from the comrad™ power supply (12V, 3A).
- When the drive is connected, one to three beeps will be heard to indicate the connection. The hard drive that will be formatted is the one connected to the USB port.
- The message "Clone HD to USB" will be shown. Press OK to begin the cloning process. The cloning process will take several minutes and "Cloning..." will be displayed on the LCD while it is being cloned.

ENTRY: Press 'Go' to enter Clone menu. Press OK to begin cloning the hard drive.

EXIT: When the cloning process is complete the menu ends up on the Clone HD to USB menu. Press cancel or the blue menu button to exit the Clone menu.

OTHER: The Cloning feature is used to repair corrupt hard drives or to upgrade other units. Remember, cloning will format the drive first, so do not use clone if you want to keep the video stored on the drive.

When using the Dual Head USB Cable, ensure that the main head (the one with two wires coming out of it) is plugged into the system.

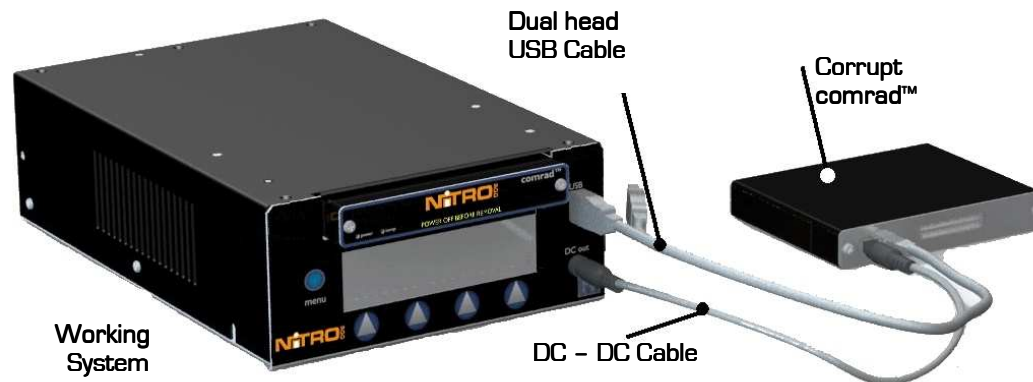


Figure 17: Cloning a comrad™.

Recording.

By default, the system will begin recording upon startup of the Bus. If you need to leave the record menu to playback video or configure the system, follow the directions below to begin recording again.

Start Recording.

Go to Record Menu, press Go. The system will start to record. While the system is in record mode, the Record menu is displayed on the LCD screen.

LCD Screen flashes between ID and Record Mode

Time elapsed since recording started

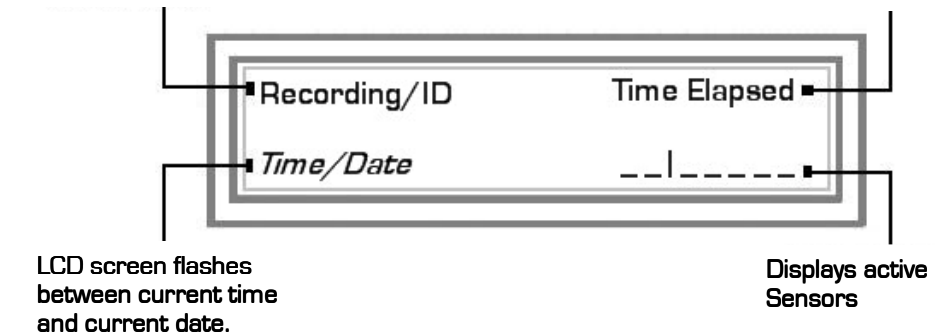


Figure 18: Record Screen.

Stop Recording.

If you want to stop recording, press the blue menu button, and then press the STOP button. The STOP button is shown only when the recorder is recording.

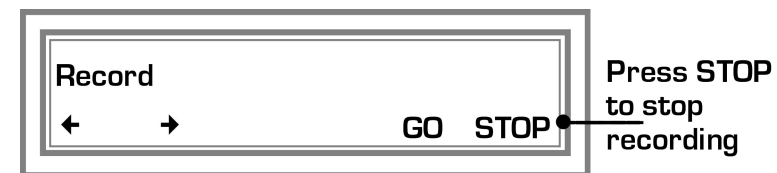


Figure 19: Stop Screen.