

Installation and Operating Manual

For

The RR1000s System

For mobile

Video surveillance

28/05

Introduction

Dear customer,

In order to take full advantage of all the features of this product, please read the following instructions carefully before commissioning and operating the unit.

All rights reserved. This document may not be copied, Xeroxed, reproduced, translated, transferred to electronic media or brought into machine readable form either in whole or in part without prior written consent from Mobile Video Systems.

These specifications are subject to change.

Contents

Introduction	3
Contents.....	4
General Information	5
Safety Precautions.....	5
Description of system	6
Summary of functions	6
Additional features available on request	7
Installation Instructions.....	8
Installation	8
Preparation	8
Unit Installation	10
Testing an Installation.....	12
Operation	13
Recording	13
Analysis of the image data.....	13
Alarm management and configuration	13
Power on functions	14
Trigger events.....	14
Error Codes.....	15
Red LED Function	15
Green LED Function	15
Trouble Shooting.....	16
LED Lead 1.5M.....	17
POWER Lead 1M	17
CAMERA Lead	17
USB Lead 0.8M	17
Maintenance.....	19
PC Software	20
Table of available software for RR1000s.....	20
Software and Firmware issues	21
USB Cables, 'Standard' and 'USB Boot'	22
Firmware Versions	23

General Information

Safety Precautions



Caution: Read these operating instructions carefully before starting up any of the components. This will avoid any damage or malfunction resulting from incorrect use.

- Installation may only be carried out by the customer services section or authorized personnel according to the existing VDE regulations.
- Only operate the device within the stated operating voltage.
- Never use the device for any purposes other than those designated
- Repairs may only be carried out by authorised personnel.
- Disconnect the device from the power supply immediately if any liquid or solid matter should enter the housing. Have the device checked by your authorised dealer before re-using it.
- Follow the notes included with the device.
- Please follow the instruction on maintenance and care included in these operating instructions
- Follow the information provided by the two system indicator lights. Failure to act on information provided by these indicators may result in loss of images.

Description of system

- This product is a digital still image recording system specially designed for installation in vehicles.
- The device uses solid state image storage technology to guarantee the highest possible reliability.
- A USB interface is provided to facilitate quick and easy transfer of images to a PC
- Various PC applications are provided to allow recorded image data to be analysed and printed.
- The unit can provide a regulated 12v power output for a dedicated camera with a current of up to 150mA. This power supply is protected against and isolated from the transients found in the Vehicles power supply.
- System Installation is optimised by segmenting the wiring loom and using multiple connectors.
- Two serial ports are provided to allow connection to a GPS receiver and GPRS/UMTS modems.

Summary of functions

- Recording of at least 4000 images
- Recording of up to 2-3 images per second
- 4 triggers inputs
- Regulated 12 supply for cameras up to 150mA
- USB port for data transfer to PC
- 2 system status indicator LEDs

Additional features available on request

Note These Features are only relevant to special projects

- Serial interface and software upgrade. For GPS receiver and GPRS / UMTS modem or Direct connection to Taxi Management Systems.
- Internal periodic trigger, available upon request by software upgrade.
- Colour, available upon request by hardware and software upgrade.
- 2 camera support, available upon request (requires external 12v supply)
- Movement detector, available upon special request.

Installation Instructions

Installation

Note: These operating instructions only refer to the RR1000sSystem, consisting of: RR1000sunit (referred to as **unit** in the following text) and the configuration and viewing software.

Note: These instructions only refer to the basic installation, for instruction on installing equipment with advanced features; please refer to the Appendix or additional literature supplied with those units.

Preparation

Before you start; please ensure you have all necessary equipment.

Equipment list

- RR1000 unit



- TX2000 Camera unit



- Adjustable camera foot



- Led cable loom



- Power/Trigger loom



- USB Cable



- Door contact (optional)
- PC Installation software
- Set of installation tools

If you don't have the latest firmware, you may download it from:
www.pointguard.se

Unit Installation

Before you start, make a note of your units' serial number.

For information on software installation see 'Software Installation' section

Unit Mounting

Select an area where the unit will be mounted. This should be away from moisture sources (when possible), away from direct heat sources, i.e. transmission tunnel or passenger compartment heaters etc. Mounting the unit may be done in many ways, as a suggestion 'Velcro®' could be used as a semi-permanent and reliable mounting method.

USB cable

If the installation requires a USB cable to be permanently mounted in the vehicle, connect the cable now and use a cable tie to prevent the cables connectors from being put under any strain.

Camera mounting

When mounting the camera consider external light sources, any bright areas in the picture will affect the automatic exposure mechanism and will make other parts of the image much darker. Mount the camera directly onto the dashboard or wind screen, seek advice from your distributor if you are not 100% happy about your particular installation. Feed the camera cable to the unit, keeping it away from sharp edges and hot areas. The PC Software can be used to aid camera alignment, simply select Live Image Mode from the Tab menu.

LED Mounting

Select an area where the LEDs are to be mounted, normally a hole will be drilled, the bezel inserted from the front of the dashboard and the LED and fixing nut from behind, for this reason ensure that the LED mounting hole is accessible from both front and back of the dashboard. LED looms are now supplied with 3mm LEDs, in some cars these may be fitted between joins in the plastic mouldings of the dash board.

Power Cable connection

The wiring loom has a Red signal wire (+12V in) and a Black signal wire (GND) (Directly below the Red). Although it is not essential, a fuse should be connected between the Red wire and the vehicles' +12V supply. This will protect the wiring and although the unit is fused internally, this fuse should be used as an additional fire prevention feature.

Door Contacts

The unit is designed to connect directly to the 'Contact Closure to Ground' type of door contact, this requires a single wire (Blue) to connect to the door contact signal, alternatively a dedicated separate door contact may be supplied by your distributor, this type of door switch may be connected in parallel, the unit provides a GND signal (Black) and a DOOR signal (Blue) for such a contact.

Top light Trigger

The input Top Light (Grey) is provided which will activate the unit when the input changes start either transitioning from +VE to GND or GND to +VE, this input may be connected to The Top light signal or interior light or Door contact. Please seek advice from your distributor about the most appropriate connection method for your type of vehicle.

Meter Trigger

The Meter trigger, unlike the other two triggers is a +VE active trigger, this means that in order to activate the meter input, the signal must be pulled to the supply voltage. Functionality of this trigger has been updated for V1_01 of the firmware. When active, i.e. pulled to +V the unit will switch on and take photos after a predefined delay and at a predefined interval. This delay and interval may be set in the PC software 'Configuration' – 'Meter Button' section.

When the 'Meter' trigger is used the 'Emergency' trigger is also active and will function as desired. **However** care must be taken with the simultaneous use of the 'Door' trigger, which has a higher priority. When the door is opened a 'door open' sequence is initiated, the unit will not respond to meter triggers again until after the door is closed. It will however respond to 'emergency triggers in this time.

The 'Meter' signal wire is Yellow.

Emergency\Driver Button

If a driver button is to be installed, install it in such a way that it is not visible to the passengers and that the passengers cannot see the driver activate it. Two signals leads are provided to connect up the driver button, GND (Black) and Emergency (Green).

Testing an Installation

After installation has been completed the entire installation can be tested with the aid of the PC software.

Use the USB lead to connect the unit to a PC with the latest version of the PC software preinstalled on it. Connecting the system to the USB cable and PC will automatically power up the unit.

Select the 'Test' tab and test the LEDs, triggers, camera and any other element desired. Next select the live images and check the image quality and camera position. Now select Configuration and set up the parameters for each 'event'. Alternatively select the required configuration file and write it to the unit.

Disconnect the USB lead either at the PC or the Unit. Now close the car door, press the emergency button (if fitted), observe the red and green LEDs, the green LED will flash on once for each image captured, the red LED will normally not light. Open the car door and observe the green LED once more, then close the door and watch the green LED again. Plug in the USB lead again and view the images under the unit tab. The green LED flashes should match the settings assigned in the configuration settings. The images should show clearly, the desired subject.

Note. When the RTC (Real Time Clock) tests are performed, the PC will update the units' clock. Therefore it is important to ensure the PC is set to the correct time otherwise the units you install will record the time wrongly.

Operation

Recording

The image recording mechanism of the RR1000s system in standard operating mode is event driven, this means that an external trigger for instance a door opening event will initiate a predefined image capture sequence.

The image store works using a ring store method. This means that normally the image store will be permanently full, when space is required for new images the oldest images will be removed and over written. However an event such as a Driver button event will mark a group of images as protected, these protected images will remain undeleted for 30 days, after this time the images will be removed to make way for new pictures. A warning signal (Red LED sequence) will indicate that the number of protected sequences has reached a certain, predefined level. The standard setting is 10 'driver' event images per trigger; a separate Red LED warning sequence also indicates 80% of maximum number of sequences. The total number of driver (protected) sequences is unlimited.

Any image found in the ring store older than 30days will be removed.

Servicing, during an image capture sequence, the Green LED will flash on once for each captured image. **A healthy system is indicated by the Red LED never illuminating and the Green LED flashing a predetermined number of times for each event.** If the Green LED doesn't come on, stays on, doesn't flash, the Red LED flashes or illuminates, have the unit serviced.

Analysis of the image data

The image data may be analysed using the configuration and evaluation software supplied. This software enables the saved image data to be accessed and analysed simply and effectively

Image data can be analysed directly from the unit, without extracting the images from the unit, it is also possible to view images stored on the PC disk. The PC software also allows individual images, groups of images, protected images and the entire image store to be transferred to the PC disk.

Alarm management and configuration

The PC software also allows the trigger events to be configured, an event such as Door opening or closing may be configured in terms of; delay from door opening to image sequence, number of pictures in the sequence and delay between each image.

Power on functions

The unit may be powered on in several ways; the power on method will determine the function the unit will perform. The normal method is to trigger the unit with a contact closure. The unit has four triggers, then the Door, Driver and meter triggers are activated the unit will remain on until the respective trigger is deactivated. The Top Light trigger will activate the unit when the input changes state from H-L or L-H, the unit will switch on and perform the predefined task then it will switch itself off, it will not remain powered up. The PC software may be used to configure all the Trigger inputs.

Trigger events

The Door Event has options for Delay, Interval and Number of Pictures for both the Opening and Closing events.

The Driver Event has only options for Delay, Interval and Number of Pictures but only for the Contact Closing Event.

Both Door and Driver events will result in the unit turning its self on, taking of the pre-programmed sequence of pictures and then turning the unit off once the trigger has been deactivated.

The Meter Event will trigger the system and store pictures at regular intervals for the whole period that the trigger is activated. The unit will then switch itself off.

The Top Light, as mentioned may be set up for Delay, Interval and Number of pictures triggered by the inputs state change. The unit will switch itself off once the sequence is complete

Error Codes

Red LED Function

When the unit is triggered, a self test is performed any errors will be indicated by flashing the Red LED. This is done at Power up time.

- 1) File-system full
- 2) –
- 3) –
- 4) –
- 5) I2C Error
- 6) No camera – Faulty Camera
- 7) RTC battery fail
- 8) 12 Volts fail
- 9) Faulty file system
- 10) Picture Store Faulty
- 11) ADC Fault detected
- 12) General Error

Precedence means only the highest numbered fault will be indicated.

Any red led activity except a single LED flash is critical; you should have the unit serviced.

The unit will always try to store a picture no matter which fault condition is detected.

Green LED Function

The Green LED will flash on for about ½ a second every time the unit stores a picture, if the unit is connected to the PC, the LEDs may be tested

Important: If the Green LED stays on without flashing or doesn't illuminate, an error state is indicated, you must have your unit serviced.

Trouble Shooting

If the Red LED illuminates, the number of times it is on indicates the error code, look up the error code in a table above.

If the Green LED doesn't illuminate when unit is triggered, you may need to check the trigger connections or door contacts.

If the Green LED illuminates but stays on without flashing, you may have a PC connected by the USB connector, a door contact is permanently closed, or the unit is activated by the Meter trigger.

RR1000s Connectors

LED

4	2
3	1

POWER

8	6	4	2
7	5	3	1

CAMERA

6	4	2
5	3	1

USB

6	4	2
5	3	1

LED Lead 1.5M

Pin Number Colour

1	Red
2	Blue
3	Black/Yellow
4	-

Function

RED LED Anode (-)
RED LED and GREEN LED Cathode (+)
GREEN LED Anode (-)

POWER Lead 1M

Pin Number Colour

1	Grey
2	Yellow
3	Black
4	Green
5	Black
6	Blue
7	Black
8	Red

Function

TOP LIGHT (State change to activate)
TRIGGER 3 (pull to Supply to activate)
GND
TRIGGER 2 (pull to GND to activate)
GND
TRIGGER 1 (pull to GND to activate)
GND (-)
MAIN SUPPLY (+)

CAMERA Lead

Pin Number Colour

1	-
2	Yellow
3	Shield
4	White
5	Black
6	Pink(Red)

Function

VIDEO INPUT
VIDEO GND
Audio (Not used)
Camera GND
Camera 12V

USB Lead 0.8M

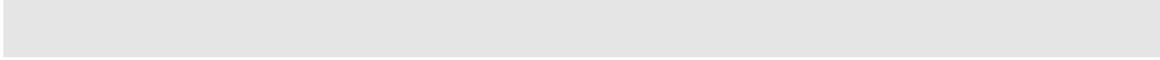
Pin Number Colour

1	Green
2	White
3	Shield
4	Red
5	Black

Function

DN
DP
USB Shield
USB V+
USB 0v

6 - (Connect to GND for USB boot cable)



Maintenance

The RR1000 system is designed to be low maintenance and to detect and report faults via the Red and Green LEDs. However we do recommend that the system is checked annually. Please ensure the follow maintenance points are observed:

- Maintenance period 1 year
- Test image quality, poor lighting conditions especially. (The Camera's Infrared LEDs may fail with time)
- Check camera alignment
- Test door contacts and other trigger inputs
- Use the PC software to check the internal battery voltage, select the 'test' tab. It should be >2.8v
- Check the Red and Green LEDs

PC Software

Table of available software for RR1000s

The latest issue of the RR1000s PC software is V1.11. Each generic type of software may be adapted to the specific Distributors requirements. i.e. Features, Icons and Logos tailored to that distributor)

Features	FULL	INSTALLER	VIEWER
Customisable Logo and Icon	X	X	X
Picture upload	X		X
Picture Viewer	X	Last Picture Only	X
Picture Viewer Disk	X		X
System Information	X	X	X
Unit Configuration Update	X	X	
Unit Configuration Viewer	X	X	X
Save / Load Configuration	X	X	Save to disk only
Unit Firmware Update	X	X	
Unit Test Features	X	X	
Unit Information	X	X	X
Live Images	X	X	
Update Time and Date	X	X	X
Erase all stored Pictures	X		
Debug	X		
Start up Password Protection	X		X
Installation Password	X		X

Software and Firmware issues

The current PC software version is RR1000S_V1_11 DistName.exe this and future versions of the PC software are available as either as a complete set of installation files or just as a single executable.

When the complete installation is performed the installation process will also install the latest versions of firmware for each generic type of RR1000/s unit

Please see the RR1000_Manual_PC_software_V1.11.doc for details of the PC software and installation process.

At time of writing a Vista version is available for beta testing.

USB Cables, 'Standard' and 'USB Boot'

When booting the RR1000 without a USB cable or with the '**Standard USB cable**' attached the RR1000 will boot from the internal Firmware.

However, if the '**Special USB Cable**' is attached to the unit during booting, the firmware will not be executed from inside the unit, instead the unit will be put into USB boot mode. Firmware will be downloaded by the PC software over the USB interface and then executed. The PC software will ask the operator to select the appropriate firmware boot file from a list.

This process will allow a completely 'dead' unit to boot and allow pictures to be extracted when possible.

The USB boot cable should only be used in special cases and is not usually delivered with systems. Details are only presented here for information.

Updated Software and Firmware can be downloaded from the website
www.taxisnap.com

Firmware Versions

As the RR1000 units have evolved, there becomes a point where we can no longer use the same firmware on newer models and older models together. The PC software will recognise the serial number and only allow the user to install a firmware version that is suitable for that model of RR1000/s

The following is a brief summary of firmware versions and unit serial numbers

Serial number	Recommended Firmware version
31000xxx	RR1000_1_07.bin
33000xxx	RR1000_1_07.bin
34000xxx	RR1000_2_10.bin
36000xxx	RR1000_2_24.bin

	A	Software Installation, 21	
Alarm, 14		Special USB Cable, 20	
		Standard USB cable, 20	
	C		T
Configuration, 25		Test, 26	
	D	Trigger, 15	
Disk, 25		triggers, 7	
	E		U
Error Codes, 16		Unit, 24	
	F	Update, 26	
firmware, 23		USB Boot Dongle, 24	
	G	USB status box, 24	
Green LED, 14, 16		usbicom.dll, 22	
	I		
INF, 22			
Information, 25			
	L		
Live Images, 25			
	O		
OFF button, 24			
	R		
Red LED, 14, 16			
Repairs, 6			
	S		
Servicing, 14			

Tel.: +49 89 491689
Mail: info@taxisnap.com
Drachenseestr. 12
D-81373 München
Germany

Technical specifications are subject to change without prior notice
© 2008 Mobile Video Systems, Germany - printed in Germany