e-Watch® Diagnostic Package User Guide

SiteWatch Version 2.6

e-Watch, Inc.

720 Lincoln Center
7800 IH 10 West
San Antonio, TX 78230
USA
www.e-watchinc.com

tel: 210 349-2000
fax: 210 341-1020

Text Part Number URG-9116-001

READ THIS NOTICE

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR E-WATCH REPRESENTATIVE FOR A COPY. NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED 'AS IS' WITH ALL FAULTS. E-WATCH AND ITS SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL E-WATCH OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF E-WATCH OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

UNITED STATES FEDERAL COMMUNICATIONS COMMISSION NOTICE

The following information is for FCC compliance of Class A devices: This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the e-Watch equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

Turn the television or radio antenna until the interference stops.
Move the equipment to one side or the other of the television or radio.
Move the equipment farther away from the television or radio.
Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

Modifications to this product not authorized by e-Watch could void the FCC approval and negate your authority to operate the product.

COPYRIGHT AND TRADEMARK NOTICE

Copyright© 2003 e-Watch, Inc. All rights reserved. e-Watch is a registered trademark of e-Watch, Inc. ViewWatch, DecisionWatch, EventWatch, SiteWatch, MotionWatch, GateWatch, AirWatch, PocketWatch, PeopleWatch, BankWatch, ClassWatch, ObjectWatch, WatchLink, Activity Gated Storage, and Gigapixel are trademarks of e-Watch, Inc. Any other trademarks mentioned in this document are the property of their respective owners. The use of the word partner does not imply a partnership relationship between e-Watch and any other company.

The use of the word partner does not imply a partnership relationship between e-Watch and any other company.

e-Watch® systems do not prevent crimes from being committed, but are intended to be used to monitor and investigate.

e-Watch components are electronic devices and complex commercial software products. As such, they may fail on occasion. Multiple devices with overlapping zones should be used for redundancy.

e-Watch event notification capabilities must be user programmed and activated prior to use. System reliability is dependent on the underlying network infrastructure and associated communications services that may fail on occasion. The user of the e-Watch system is advised to evaluate risk associated with network failures and operator errors. Routine auditing and preventive maintenance of the system is essential to assure optimum performance.

Event analysis and recreation is subject to system configuration, lighting conditions, environmental conditions, lens and housing cleanliness, distance to subject, operator-invoked control settings, and many other factors.

Read and follow all documentation to assure proper performance.

CONTENTS

Preface
- Purpose
- Audience
- Organization
- Conventions
- Obtaining Documentation
  - World Wide Web
  - By Mail
- Documentation Feedback
- Obtaining Assistance
  - Customer Support
  - Sales

PART 1 **Diagnostic Program**

CHAPTER 1 **Introduction 7**
- Overview 7
- Requirements 8
- Installation 8
- For more Information 8

CHAPTER 2 **THE AGENT APPLICATION 9**
- Overview 9

CHAPTER 3 **THE VIEWER APPLICATION 10**
- Overview 10
- Static Camera Data 11
- Dynamic Camera Data 13
- Agent Data 14
- Interpreting The Data 14
- Saving A Snapshot 16
- Resetting The Camera 17

PART 2 Appendices
APPENDIX A List Of Tables 18

PREFACE

The preface describes the purpose, audience, organization, and conventions of this guide and provides information on how to obtain related documents.

The preface covers these topics:

- Purpose
- Audience
- Organization
- Related Documentation
- Conventions
- Obtaining Documentation
- Documentation Feedback
- Obtaining Assistance

Purpose

This User's Guide provides instructions for operating the diagnostic applications available from e-Watch for use with the WatchCam cameras on an IP network. The e-Watch Diagnostic Package is designed to help identify and diagnosis hardware and network problems. The Diagnostic Package consists of two applications, the Agent and the Viewer. This guide is indended to provide help for these applications.

Audience

The e-Watch Diagnostic Package User's Guide provides operating instructions for personnel responsible for the setup and maintenance of the e-Watch Situation Awareness System. Some knowledge of Microsoft Windows®, TCP/IP and Windows® Web Browsing is preferred.

It is assumed that the reader of this guide is familiar with the e-Watch Situational Awareness System. For information and procedures on how to

operate the e-Watch interface, refer to e-Watch, Inc. document URG-9106-001, User Guide, e-Watch Monitoring Station, Core Product Suite, available from e-Watch, Inc.

Organization

This document is organized as shown in the following table

Table 0-1 Document Organization

Part	Description
Part 1	'The Diagnostic Programs' Contains information on set-up and use of the e-Watch Diagnostic Package.
Part 2	'Appendices' Contains lists, glossary and meaning of abreviations.

Related Documentation

Refer to the following documents for further information about e-Watch setup and installation

- URG-9110-001—SiteWatch™ Situational Awareness System Administration Guide
- URG-9111-001—e-Watch® Situational Awareness System Quick Start Guide
- URG-9105-001—GateWatch™ Third-Party Integration Software Administration Guide
- URG-9112-001—e-Watch Product Overview

Conventions

This document uses the following conventions:

Table 0-2 Conventions

CONVENTION	DESCRIPTION
Boldface font	Commands and keywords are in **boldface**.
Italic font	Arguments for which you supply values are in *italics*.

Table 0-2 Conventions

[ ]	Elements in square brackets are optional.
{x|y|z}	Alternate keywords are grouped in brackets and separated by vertical bars.
[x|y|z]	Optional keywords are grouped in brackets and separated by vertical bars.
String	A non-quoted set of characters. Do not user quotation marks around the string or the string will include the quotation marks.
`Screen font`	Terminal sessions and information the system displays are in `screen font`.
`Boldface` `screen font`	Information you must enter is in **`boldface`** `screen font`.
`Italic` `screen font`	Arguments for which you supply values are in *`italic`* `screen font`.
^	The symbol ^ represents the key labled Control - for example, the key combination of ^D in a screen display means hold down the Control key while you press the D key.
-->	This pointer highlights an important line of text in an example.
<>	Non-printing characters, such as passwords, are in angle brackets.

Obtaining Documentation

The following sections provide sources for obtaining documentation from e-Watch, Inc.

World Wide Web

e-Watch documents can be found by going to the e-Watch web site www.e-watchinc.com

By Mail

e-Watch, Inc.
720 Lincoln Center
7800 IH 10 West
San Antonio, Texas 78230
210.349.2020

support@e-watchinc.com

Documentation Feedback

You can submit technical comments about e-Watch documentation in the following ways:

E-mail your comments to support@e-watchinc.com

To submit comments by mail, write to the following address:

e-Watch, Inc.
720 Lincoln Center
7800 IH 10 West
San Antonio, Texas 78230

We appreciate your comments.

Obtaining Assistance

The following sections provide sources for obtaining assistance from e-Watch, Inc.

Customer Support

For technical assistance please send requests to support@e-watchinc.com or your local e-Watch reseller. You may also call 210-349-2000 and ask for Customer Support.

Sales

For assistance with sales or marketing please call 210-349-2000 and ask for sales or send requests to sales@e-watchinc.com.

CHAPTER 1

Introduction

Overview

The e-Watch Diagnostic Package is provided to help identify and diagnose hardware and network problems. Using the e-Watch Diagnostic Package you can:

- Review important camera configuration information
- Monitor camera operating statistics
- Verify that JPEG images are saved on the e-Watch Server
- Check multicast performance at strategic points in the network

e-Watch is a network-based digital surveillance and monitoring system. The system operates on digitized video streams created by video encoders that are strategically located and connected to the network. e-Watch servers on the network receive and store the video streams. Monitor Stations on the network receive the video streams and make them available for real-time viewing. The e-Watch Diagnostic Package is designed to help identify and diagnose hardware and network problems with an e-Watch installation.

While a new network may be built for an e-Watch installation, e-Watch may also be installed in an existing network infrastructure. In either case, correct operation of e-Watch is dependent on correct and efficient operation of the underlying network. Experience has shown that it is often difficult to determine whether a problem is caused by e-Watch equipment or by network equipment. The e-Watch Diagnostic Package is designed to help identify and diagnose hardware and network problems.

The e-Watch Diagnostic Package includes two executable programs. The Agent program is intended to be executed on computers at strategic locations on the network. The Agent collects data about the video stream from a selected encoder at that location on the network. The Viewer program can be executed on any computer. The Viewer can connect to up to three Agent programs simultaneously, and display the data collected by

the Agents. The Viewer also displays other useful information about the encoder being monitored.

Requirements

Agent Program

1. Any computer that supports a Java Virtual Machine
2. Installed Java Virtual Machine

Viewer Program

1. Microsoft Windows 32-bit computer (Windows 95, 98, NT, 2000, XP)
2. Installed Java Virtual Machine

Installation

Installation of both the Agent and View programs is accomplished by running the **`setup.exe`** installation application. The installation program will install both the Agent and View programs. The Agent application can then be copied to other areas of your system.

For more Information

e-Watch Sales at sales@e-watchinc.com
e-Watch Technical Support at support@e-watchinc.com

CHAPTER 2

The Agent Application

Overview

You should run the Agent program at strategic points in the network where you wish to check multicast performance. For checking a particular camera, it is wise to run an Agent program on a computer near the camera, preferably connected to the same network switch. This Agent program can then serve as a baseline for comparison to Agent programs at more remote locations.

The Agent program is strictly a data collection program. It has no user interface.

The Agent program can simultaneously accept connections from many Viewer programs. For each connection, the Agent program collects multicast performance statistics for a selected camera, and sends the statistics back to the Viewer program.

If you plan to use the Diagnostic Package over a long period of time, you might wish to consider adding the Agent program to the computer's Startup program group.

Agent programs are not auto-detected at this time, so you may wish to keep a list of the computers on which the the Agent program has been installed.

CHAPTER 3

The Viewer Application

Overview

The Viewer program provides the visual interface for the e-Watch Diagnostic Package.

Using the Viewer program, you can connect to a camera. The Viewer displays the camera's configuration data, and starts a dynamic display of camera operating statistics. Operating statistics that are outside the normal range may indicate a problem with camera.

You can also connect to three Agent programs. For each connected Agent, the Viewer displays multicast performance data collected by the Agent. Significant differences in multicast performance data collected by Agent programs at various locations in the network may indicate a network equipment or configuration problem.

Camera operating statistics that are within the normal range together with generally poor multicast performance data collected by Agent programs also may indicate a network equipment or configuration problem.

Try connecting to various Agent programs throughout the network to get a picture of network-wide multicast performance.

Connecting To A Camera

1. Enter the IP address of the SiteWatch™ server in the **Server IP Address** box.
2. Select the camera in the **Camera** drop down list.
3. Click the **Connect** button.

Or, if the camera is not connected to a running SiteWatch server:

1. Leave the **Server IP Address** box blank.
2. Fill in the **Camera IP Address** box.
3. Click the **Connect** button.

Static Camera Data

The static camera data are displayed when the Viewer is connected to a camera. They do not change.

Video Settings

The video settings determine how the video image looks when displayed by an e-Watch Monitor Station.

Table 3-1 Video Settings

Picture Brightness	0 (darkest) to 100 (brightest)
Picture Contrast	0 (least) to 100 (most)
Color Saturation	0 (none) to 100 (vivid)
Color Hue	50 is normal

Stream Settings

The stream settings determine which video streams are produced by the camera, and control e-Watch Activity Gated Storageô. Consult the e-Watch Users's Guide for more information about Activity Gated Storageô, and how the JPEG Motion Detect Threshold and JPEG Motion Detect Percent Change are used.

Table 3-2 Stream Settings

JPEG Stream	On or Off
JPEG Quality	0 (lowest) to 100 (highest)
JPEG Framerate	number of seconds between JPEG images
JPEG Motion Detect Threshold	0 (least sensitive) to 100 (most sensitive)
JPEG Motion Detect Pct Change	0 (least sensitive) to 100 (most sensitive)
JPEG Resolution	size of the JPEG image
Low bandwidth MPEG Stream	On or Off
High Bandwidth MPEG Stream	On or Off
Video Source	for encoders with multiple inputs

IP Configuration

The IP configuration determines how the camera obtains an IP address, to which e-Watch server it sends JPEG images, and other network properties.

Table 3-3 IP Configuration

IP Mode	DHCP or Static
IP Address	blank if IP Mode is DHCP
Subnet Mask	blank if IP Mode is DHCP
Default Gateway	blank if IP Mode is DHCP
Server IP Mode	DHCP or Static
Server IP Address	blank if Server IP Mode is DHCP
Time To Live Mode	DHCP or Static
Time To Live	blank if Time To Live Mode is DHCP

Current IP Data

This section displays the camera's current Internet Protocol and related data.

Table 3-4 Current IP Data

IP Address	Current IP address
Server IP Address	Current e-Watch server IP address
Server Version	e-Watch server software version
Camera ID	e-Watch software camera ID
Number Of Unicast Destinations	Number of destinations receiving a unicast from the camera

Hardware And Firmware

This section displays information about the camera hardware and firmware.

Table 3-5 Hardware and Firmware

Hardware Address	Camera's hardware (MAC) address
Model	e-Watch model code
Camera Type	Internal camera manufacturer and model

Table 3-5 Hardware and Firmware

Firmware Version	Camera's firmware version
Hardware Version	Camera's hardware version
Board Temp	Temperature of the camera's board if available.
Power Supply Temp	Temperature of the camera's power supply if available

Dynamic Camera Data

The dynamic camera data are collected while the Viewer is connected to a camera. As these data are collected from the camera, they provide information about the operation of the camera. They do not provide information about the operation of the network. The MPEG data are collected for both the high bandwidth (SIF) and low bandwidth (QSIF) streams. The last reset and MPEG data are updated in 1-second intervals. The stored images data are updated in 10-second intervals.

Table 3-6 Dynamic Camera Data

Last Reset	Date, time and reason for last camera reset
Details Button	Displays diagnostic data for e-Watch Support
MPEG Packets	Number of multicast packets sent since last reset
MPEG Packets/ Second	Average number of multicast packets sent per second (15 second average); **this number should be about 115 for high bandwidth and 15 for low bandwidth**
MPEG Overflows	Number of internal buffer overflows; **this number should always be zero**
MPEG Timeouts	Number of internal encoder chip timeouts; **this number should always be zero**
MPEG Stops	Number of times the MPEG streams has been stopped; this number may be greater than zero if the stream has been stopped manually
MPEG Drops	Number of multicast packets dropped; **this number should always be zero**
JPEG Images	Number of JPEG images saved on the e-Watch Server; **this number should increment if there is motion in the camera's field of view**

Agent Data

Agent data are collected for each Agent to which the Viewer has been connected. As these data are collected from agents running at various locations on the network, they provide information about the operation of the network. The MPEG data are collected for both the high bandwidth (SIF) and low bandwidth (QSIF) streams. The data are updated in 1-second intervals.

Table 3-7 Agent Data

Running Time	Time since the Viewer was connected to the Agent
MPEG Packets Sent	Number of multicast packets sent by the camera since the Viewer was connected to the Agent
MPEG Packets Received	Number of multicast packets received by the Agent; **this number should always be close to 100%**
MPEG Sequence Errors	Number of multicast packets received out of sequence; **this number should always be close to zero**
MPEG Packets Lost	Number of multicast packets not received; **this number should always be close to zero**
MPEG 5 Second Delays	Number of delays between multicast packet receipts greater than five seconds; **this number should always be close to zero**

NOTE - *Agent Data is collected only for MPEG streams. If a camera is producing Motion JPEG, Agent Data will not be available for the low bandwidth stream.*

Interpreting The Data

The Dynamic Camera Data and Agent Data can provide valuable information about the operation of the e-Watch camera and the network. In particular, the Agent Data can reveal common network problems that may adversely affect video quality.

When investigating apparent network problems, be sure to check the operation of the computer that is running the e-Watch Monitor Station or the Agent program. Problems that appear to be network related are sometimes caused by a computer that has an inefficient network interface card, or that has inadequate memory or CPU capacity. Run the computer's system diagnostic program to check for high memory or CPU utilization.

Try increasing and decreasing the process load on the computer to determine if this affects the Agent Data.

Dynamic Camera Data

e-Watch video encoders produce MPEG packets at a constant rate. The **MPEG Packets/Second** is about 115 packets per second for the high bandwidth stream, and about 15 packets per second for the low bandwidth stream. The rates displayed by the Viewer program can vary, but should remain within 10% of the nominal rate. Packet rates that vary from the nominal rate by more than 10% indicate a possible problem with the video encoder.

Overflows and **Timeouts** are related to the operation of the onboard video encoder microprocessor. These numbers should always be zero. Values greater than zero indicate a possible problem with the video encoder.

Drops are multicast packets that could not be sent. This number should always be zero. Values greater than zero indicate a possible problem with the camera's network interface or with the network infrastructure.

Stops are the number of times that the multicast stream has been stopped. Streams can be stopped manually from an e-Watch monitor station, so values greater than zero do not necessarily indicate a possible problem.

Agent Data

If the network is operating at one hundred percent efficiency, every multicast packet sent by the camera will be received by the Agent program. Moreover, the multicast packets will be received in the same order in which they were sent, and will be received at a relatively smooth and constant rate.

Most networks, however, do not operate at one hundred percent efficiency. The Agent Data provides information about the performance of the network at different network locations.

Packets counts the number of multicast packets sent by the camera while the Agent program has been connected to the camera.

MPEG Packets Received counts the number of multicast packets received by the Agent program during the same period, both as a raw number and as a percentage of the number of multicast packets sent.

Sequence Errors counts the number of multicast packets received by the Agent program that were not received in the same order in which they were sent, both as a raw number and as a percentage of the number of multicast packets sent. Sequence Errors produce "skips" in the video. Sequence Errors are often caused by problems with the network equipment in the route between the camera and the Agent program. Analyze Sequence Error

data from various locations in the network to pinpoint the offending network components.

- Sequence Error rates less than .2% are tolerable and do not severely affect video quality.
- Sequence Error rates between .2% and 1% produce noticeable "choppy" video.
- Sequence Error rates greater than 1% will severely affect video quality.
- Sequence Error rates greater than 8% will cause the video to appear to "freeze".

Packets Lost counts the number of multicast packets that were sent by the camera, but never received by the Agent program, both as a raw number and as a percentage of the number of multicast packets sent. The number of packets lost affects the duration of "skips" in the video. Packets Lost are often caused by problems with the network equipment in the route between the camera and the Agent program. Analyze Sequence Error data from various locations in the network to pinpoint the offending network components.

- Packets Lost Rates less than 1% are tolerable and do not severely affect video quality.
- Packets Lost Rates between 1% and 10% produce noticeable "choppy" video.
- Packets Lost Rates between 10% and 50% will severely affect video quality.
- Packets Lost Rates greater than 50% will cause the video to "dropout" and display a "Data Stream Interrupted" message.

5 Second Delays counts the number of delays greater than 5 seconds between receipt of successive multicast packets by the Agent program. 5 Second Delays can cause the e-Watch Monitor Station's buffer to empty, thereby causing a temporary "dropout" in the video. 5 Second Delays are usually caused by a network switch or router that is not forwarding the multicast packets efficiently. Quality Of Service configurations have been observed to cause 5 Second Delays.

Saving A Snapshot

You can save a snapshot of the data collected by the e-Watch Diagnostic Package. The data is saved in text file format.

4. Click the **Save Snapshot** button.
5. In the **Save Snapshot As** dialog, choose a destination folder and file name.

6. Click the **Save** button.

Resetting The Camera

You can reset the camera by clicking the **Reset Camera** button. When the camera resets, the camera dynamic data are reset to zero.

APPENDIX A

List Of Tables

Table 0-1 Document Organization 4
Table 0-2 Conventions 4
Table 3-1 Video Settings 11
Table 3-2 Stream Settings 11
Table 3-3 IP Configuration 12
Table 3-4 Current IP Data 12
Table 3-5 Hardware and Firmware 12
Table 3-6 Dynamic Camera Data 13
Table 3-7 Agent Data 14