Agilent N9384A Intelligent Traffic Video Detection Workstation

Data Sheet

Overview

The Agilent N9384A intelligent traffic video detection workstation is a system within the Agilent's traffic data measurement systems line of products. This system consists of both hardware and software.

This document serves as both datasheet and technical specification for the hardware build up, the software features and the necessary setup and configuration for the N9384A intelligent traffic video detection workstation.

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Hardware Build-up

The N9384A system runs with a standard industrial grade PC hardware that comes with the common computer peripherals. Added video processing hardware is built in for accepting multiple channels of video camera feeds for the software processing. The entries below provide a brief overview of the build-up of hardware within the N9384A system.

The Agilent-Enabled Advantech N9384A Industrial PC

The Advantech industrial PC forms the main component of the Agilent N9384A intelligent traffic video detection workstation. The Advantech system comprises common hardware used for build up of an industrial grade PC, running with an Intel® Core 2 Quad 2.93 GHz Processor on a standard motherboard with 4 GB of RAM and a 250 GB hard disk drive. On top of that, it comes with a standard graphics card with 128 MB memory and a 20x SATA DVD-RW drive.

Video Capture Cards

The Advantech DVR cards or video capture cards form the main hardware that enables the Agilent N9384A system to take in camera video feeds for processing. These cards are inserted into the PCI Slots of the industrial PC's motherboard. Depending on the number of channels configured, there are two types of video capture cards that can be used:

- **DVP-7020BE**
  4-channel video capture card, capable of taking in video feeds from a maximum of four different cameras for each card. The number of video channels dictates the number of cards used; if four or fewer video channels are required, you will only need one card while requirements ranging from 5 to 8 channels will require two cards.

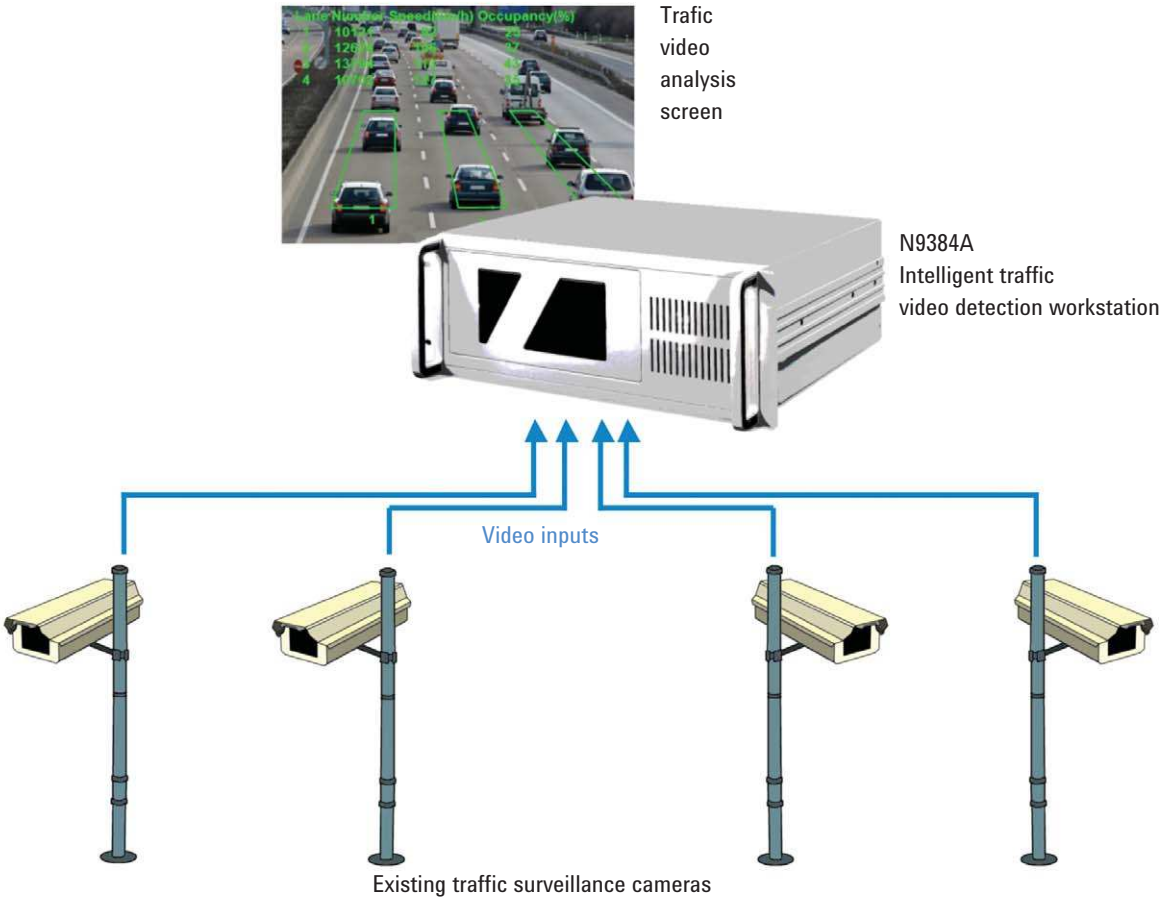
- **DVP-7026AE**
  16-channel video capture card with the maximum capability of taking in video feeds from 16 different cameras with a single card. This card is used as a standalone inserted into the PCI slot of the industrial PC used for configurations that require processing of up to 16 video feeds.

External Peripherals

- 17" flat panel LCD monitor
- USB keyboard
- USB mouse

For more details on the hardware, please refer to the System Specification section.

How it works



The N9384A system easily plugs into any traffic camera network and takes in video feeds from traffic cameras for processing. Video feeds from the traffic cameras are fed into the workstation. The built-in software then harvests data from the video for processing.

System Specifications (Hardware)

Industrial PC Specification

Processor:	Intel Core 2 Quad 2.83 GHz, 1333 MHz FSB, 12MB L2 Cache
Memory:	2 x 2GB DDR2 800 MHz
Backplane:	13 slots PICMG 1.3
LAN:	Dual gigabyte Ethernet
Hard Drive:	250 GB serial ATA
Misc. Drives:	LiteON DVD-RW Drive, 3.5" 1.44 MB floppy drive
Size (W x H x D):	482 mm x 177 mm x 502 mm (19" x 7" x 19.76")
Weight:	20.0 kg[1]

Video Capture Specification

Video standard:	Composite for NTSC/PAL
Video input channels:	4 – 16[2]
Video connector:	BNC[3]
Compression format:	MPEG4, H.264
Image processing:	Hardware adjustments for hue, contrast, saturation and brightness

Environment

Working temperature:	0 ˚C ~ 40 ˚C
Relative Humidity:	10% ~ 80%
Packaging Standards:	Standard IPC packaging

Regulatory

CE, FCC, C-TICK, CCC, UL

Warranty Support

- One-year warranty
- Extended warranty available

Support provided by Agilent trained technical support staff

1. Approximate weight, dependant on the addition of additional hardware
2. Standard N9384A comes with a minimum of 4 channels
3. BNC connectors are for analog video, digital video from IP cameras are transmitted via LAN

The TDMS Software

Key traffic data and analysis results collection

The traffic data and analysis results are divided into two categories - basic parameters and enhanced parameters.

Basic parameters

- Traffic counts
- Average traffic speed
- Traffic occupancy

Enhanced parameters

- Vehicle classification
  - Classifying traffic into categories based on vehicle length
  - Presenting real time vehicle counts of each category
- Incident detection
  - Detection of stalled vehicles (breakdown, accident etc)
  - Detection of vehicles doing illegal stops
  - Detection of vehicles travelling in the wrong direction
  - Detection of queued traffic (tolls, bridge entrances, tunnel entrances etc)
  - Congestion detection
  - Detection of pedestrians in dangerous areas
  - Detection of foreign objects and debris on road
  - Car plate recognition for law enforcement

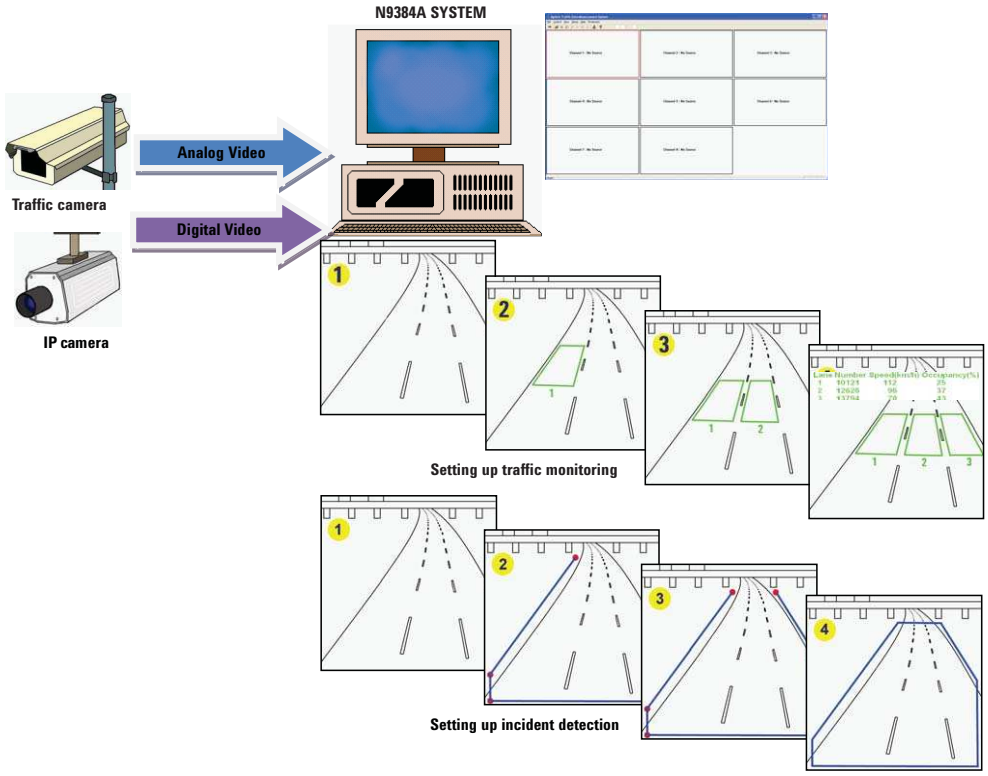
Features

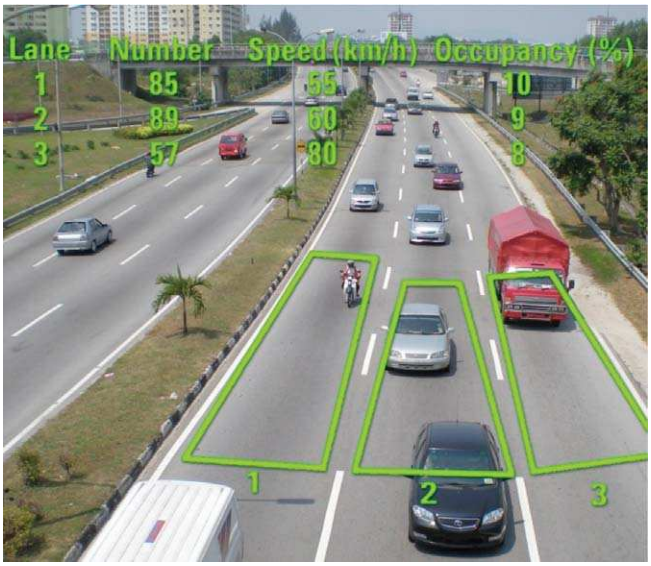
- Quick visual information
- Multi-parameter traffic analysis
- Multiple lane analysis
- History log record with screen captures for detected incidents
- User defined data acquisition rate (eg. 1 minute)
- Remote configuration and diagnostics
- Traffic report generation
- Historical data storage

Application Strengths

- System can be deployed to existing camera networks without the need for new cameras
- System is capable of handling digital video feeds from IP cameras
- Rapid setup, monitoring and analysis can be configured with just a few easy clicks
- Real time traffic monitoring; data can be obtained on the fly
- Simple installation and ease of use
- Reduces maintenance and infrastructure costs
- Automated monitoring and data presentation

Setup & Configuration

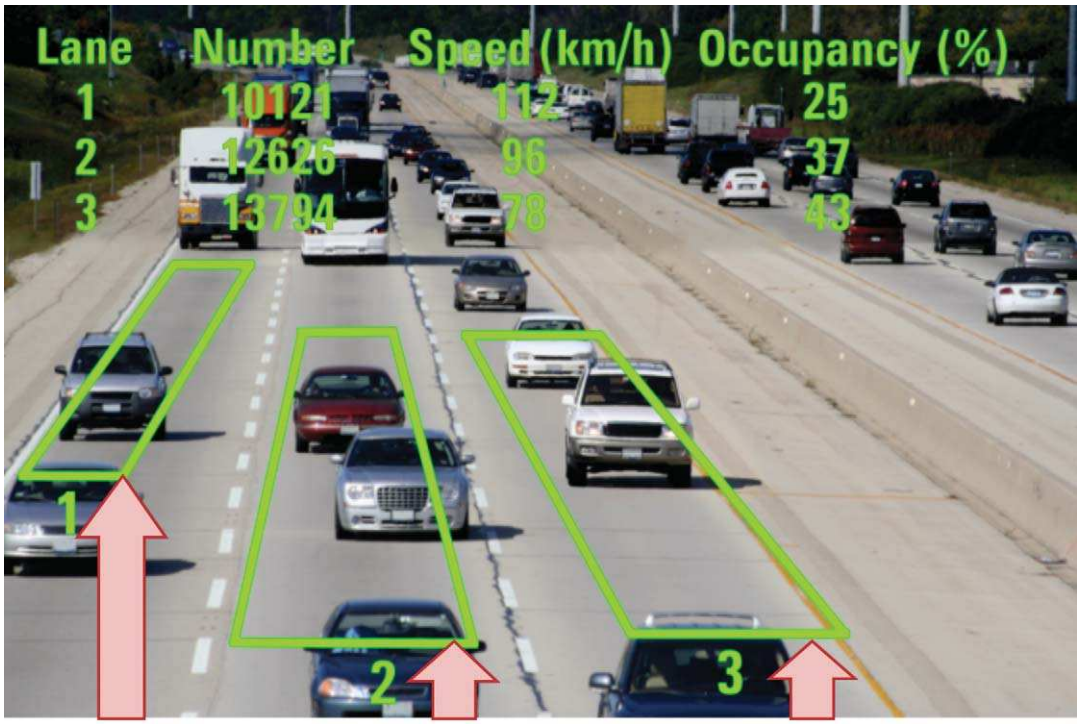




The quick setup feature in the TDMS software requires only four steps to get the software running and performing monitoring and analysis on the traffic videos. These four steps consist of straightforward methods of getting the video stream, specifying the monitoring loops on lanes and starting the software.

Adapting the software to different traffic conditions

The software easily adapts to different camera angles and traffic flow; the screenshot below gives a brief explanation of how it is done.



Monitored area does not need to extend to the end of screen or align to other lanes

An optimal setup area in terms of length, width, and camera angle

Area can be setup to align to the side of the road to compensate for the possibility of large vehicles from Lane 2 overlapping to Lane 3

Figure 1: Demonstration of the system's flexibility in handling different camera angle and position

Application Areas

City Traffic

The N9384A system can be deployed into urban areas where the automated monitoring and data presentation provide a quick and detailed overview of the traffic situations at each traffic camera. The information can be utilized as a means of traffic management and announcements.

Highways and Bridges

Traffic monitoring can be achieved at these areas using the N9384A system even with the traffic flowing at relatively high speeds. Monitoring can be further enhanced by incident detection and congestion detection. Information harvested here can be used for travel time estimation and speed limit controls.

Tunnels

The N9384A system's incident detection and congestion Detection capabilities can be deployed in these areas to allow better traffic and incident management in tunnels. Further usage can be applied to tunnel entrances for queue detection.

Intersections, Tolls, and Traffic Lights

The N9384A system can be effectively deployed by using queue detection. The monitoring results can be used for assessments to gauge and control traffic lights, opening of service or emergency lanes in long queue situations, or even to deploy traffic police for directing traffic.

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