

## the i-Volution™ 4000 HARDENED ENCODER

### Advanced Network Codec Series with Integral Layer 2 Switching

The i-Volution 4000 (i4000) Series of Video-over-IP encoders delivers outstanding performance for advanced surveillance applications requiring high resolution, full motion video. The i4000 can encode a single MPEG-1/MPEG-2 video stream and two serial data channels for transport over a standards-based IP network. The MPEG video stream can be viewed simultaneously from any PC and/or CCTV monitor in the network.

The i4000 is available as a stand-alone single port video encoder with dual 10/100 Base-T Ethernet interfaces. Optional single or dual fiber 100 Base-FX Ethernet interfaces are also available.

The i4000 comes standard with dual Ethernet interfaces. Single or Dual Optical interfaces are also available.



i4020 Dual Ethernet



i4021 Single Optics



i4022 Dual Optics



i4000  
Back View

#### applications

- Security Surveillance
  - Airports
  - Military
  - Industrial Complexes
  - Hospitals
  - Campuses
  - Detention Centers
- Transportation Monitoring
  - Road (ITS)
  - Rail/Light Rail
  - Subway/Metro
- Industrial Process Control

#### High Resolution - Full Motion Video

Impath Networks i4000 provides the highest digitized video quality over standard IP Ethernet networks. Every image is encoded in real-time and displayed at 30/25 (NTSC/PAL) frames per second. This advanced capability provides full motion DVD quality video for digital CCTV surveillance applications.

#### Single Channel Capacity

The i4000 provides single-channel video for surveillance applications supporting dispersed video cameras over an IP network. The two serial data ports provide additional support for PTZ, NMS and Point of Sales applications.

#### Network Scalability and Flexibility

The stand-alone i4000 Encoder is ideal for a multitude of surveillance applications requiring single or extended network channel flexibility and high quality full motion video. The integral Layer-2 network switch allows for easy deployment and permits extended channel capability (cascading of i4000s) to eliminate distance and topology restrictions.

Advanced features such as On-Screen-Display (OSD) allows network administrators to display camera name, date, time, resolution, bit rate and other related information onto any video monitor in the network. When used in combination with the Video Motion Detection feature, the i4000 provides effective, real-time surveillance and alarm notification.

#### Enhanced IP Multicast Capability - Video & Data

i-Volution simplifies network connectivity via standards-based multicast technology for streaming video and data within an IP network. IP Multicasting provides the ability to distribute information efficiently to an unlimited number of remote locations via a single communications interface at the central site. This flexibility reduces hardware and bandwidth requirements while optimizing the overall network.

#### Temperature Hardened

The i4000 is designed to meet high availability network requirements. The unit is environmentally hardened to operate over extended operating ranges and is conformal coated to ensure maintenance free operation.

#### Standards Compliant

Video is encoded using standard MPEG-1/MPEG-2 compression. The video stream(s) can be viewed by Impath software/hardware decoders and/or 3rd Party products.

The video and serial data can be transmitted over any standard IP network. This includes Ethernet, Gigabit Ethernet, SONET/SDH and ATM networks.

#### Network Manageability

The i4000 can be managed both locally and remotely using Telnet, i-Volution NMS or via 3rd Party SNMP network management systems.

# the i-Volution™ 4000

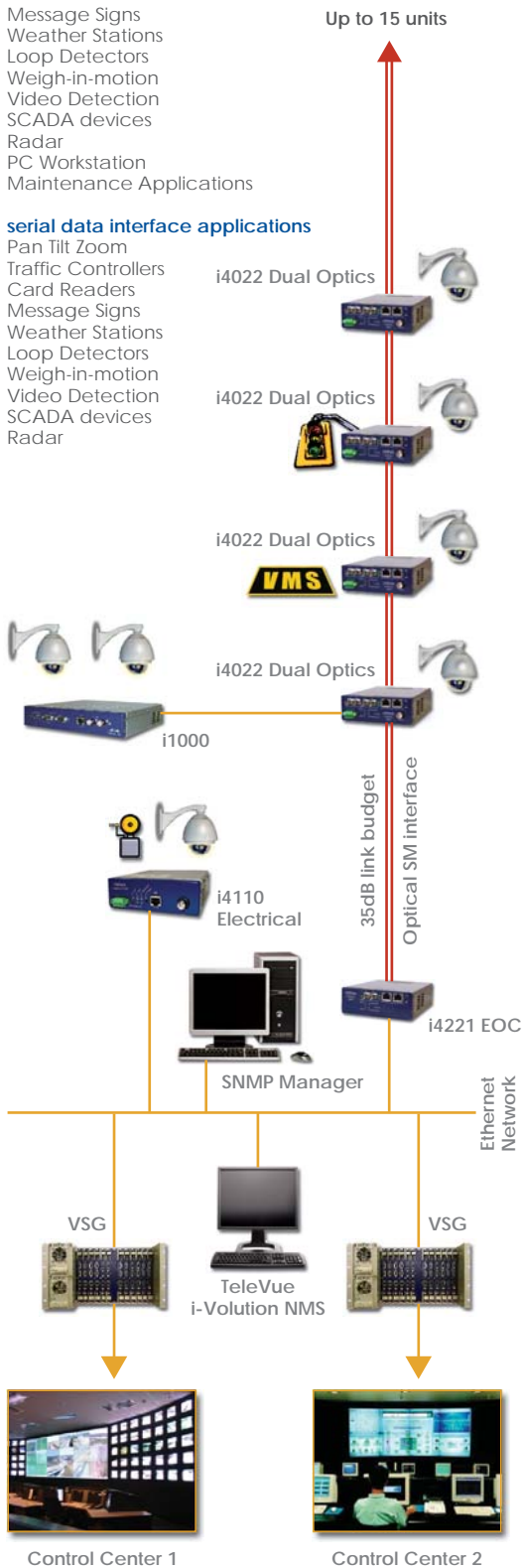
## HARDENED ENCODER

### ethernet interface applications

Pan Tilt Zoom  
Traffic Controllers  
Card Readers  
Message Signs  
Weather Stations  
Loop Detectors  
Weigh-in-motion  
Video Detection  
SCADA devices  
Radar  
PC Workstation  
Maintenance Applications

### serial data interface applications

Pan Tilt Zoom  
Traffic Controllers  
Card Readers  
Message Signs  
Weather Stations  
Loop Detectors  
Weigh-in-motion  
Video Detection  
SCADA devices  
Radar



### Video

Analog Video  
IP connectivity  
Digital Encoding

### Data Rate

Resolution  
Full  
HHR  
SIF  
QSIF  
Latency

NTSC (30 fps), PAL (25 fps) on a BNC 75 ohm connector  
Unicast and Multicast (UDP)  
MPEG-1 (ISO/IEC 11172-2) and MPEG-2 (ISO/IEC 13818-1 Transport Stream or ISO/IEC 13818-2 Elementary Stream) MP@ML  
128 kbps to 8 Mbps in Transport Stream and up to 12 Mbps in Elementary Stream

	NTSC	PAL
720 x 480	720 x 480	720 x 576
352 x 480	352 x 480	352 x 576
352 x 240	352 x 240	352 x 288
192 x 128	192 x 128	160 x 128

170ms with Optimal Setting

### Data

Format  
IP Connectivity  
Connectors  
Interface  
Data Rate

Serial/Asynchronous  
Unicast and Multicast (UDP)  
(2) DB9-F  
EIA-232, EIA-422/485 - 2 or 4 Wire, Half or Full Duplex, software programmable  
300bps to 115.2 kbps

### LAN

LAN Format  
Interface

IEEE 802.3 Ethernet  
RJ 45 10/100 Base-T Ethernet, Half/Full Duplex, Auto-Sensing  
Integral Layer-2 Switching with Extended Channel Support  
*When Multicast video mode is used, any device connected on the Ethernet port of the i4000, must negotiate it's speed to 100 Mbps Full Duplex. Maximum cascade of 15 units provided aggregate bandwidth <70% of LAN link.*  
TCP, UDP, IPv4, IGMPv2, RTP, Diffserv, SAP, SNMPv2

### Optical Link (optional)

Optical Format  
Connector/Fiber  
Interface

IEEE 802.3 Ethernet  
ST/Single Mode/35dB link Budget  
100 Base-FX Ethernet, Full Duplex  
Integral Layer-2 Switching with Extended Channel Support  
*Maximum cascade of 15 units provided aggregate bandwidth <70% of Optical Link.*  
100 Mbps

### Motion Detection

Zone  
Sensitivity  
Re-Arm Delay

Full Screen  
User Selectable: Low to High (1 to 10)  
User Selectable: 100ms to 25 seconds

### Contact Sense & Closure

Connector  
Contact Sense  
Dry Contact  
Maximum Rating  
Re-Arm Delay

Terminal Block  
Output Voltage: +5 VDC, Maximum Resistance: 1.2 K Ohms  
Off Leakage: < 1 nA, On Resistance: 1.5 Ohms  
250 Vp / 150 mA  
User Selectable: 100ms to 25 Seconds

### Alarms

Via NMS/SNMP

Video Loss Detection, Video Motion Detection, Contact Sense & Closure  
Unit Configuration Change/Unit Reset

### Management

Local Management  
Remote Management  
Software Updates

Via Serial (Console) Maintenance Port, LED Status Display  
Via i-Volution NMS (TeleVue), Telnet, SNMPv2  
Via Network Download - One or multiple units simultaneously

### Power

Input Voltage  
Consumption

11.4 - 15 V DC (.100" center pin diameter lock type connector.)  
*AC Power Adaptor included*  
9 to 18 W (model dependant)

### Physical

Size/Weight

W 5.0" (12.7cm) x H 1.72" (4.37 cm) x L 7.5" (19 cm) / 1.34 lbs (0.6 kg)

### Environmental

Operating Temperature  
Relative Humidity  
Environmental Protection  
RoHS Compliance

-34°C to +74°C  
5% to 95%, Non-Condensing  
PCB Conformal Coating  
EU directive 2002/95/EC (*Available on request*)

### Regulatory Approvals

Emissions  
Europe  
North America  
Australia/New Zealand  
Immunity  
Laser Products  
Europe  
North America

EN55022: 1998 For Class A, EN61000-3-2: 1995 & EN6100-3-3: 1995  
FCC47 CFR Part 15, Subpart B: 1999 Class A  
AS/NZS 3548: 1995 for Class A  
EN55024  
IEC60825-1,2  
CFR1040 Class 1

Variant	Video ports	Data ports	Ethernet posts	Optical ports
i4020 Dual Ethernet	1	2	2	0
i4021 Single Optics	1	2	2	1
i4022 Dual Optics	1	2	2	2
<b>Other i4000 Variants - Refer to individual datasheets</b>				
i4110 Encoder	1	2	1	0
i4221 Single EOC	0	0	2	1
i4222 Dual EOC	0	0	2	2

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