

**Signal Communications Ltd.**

Application  
For  
Certification  
**(FCC ID: NAGSCVR-020730)**

**TeleEye III+ Video Recording Transmitter**  
August 15, 2002

WO# 02056122  
DL/Sandy  
August 15, 2002

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## INTERTEK TESTING SERVICES

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### LIST OF EXHIBITS

#### *INTRODUCTION*

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<i>EXHIBIT 4:</i>	Equipment Photographs
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<i>EXHIBIT 6:</i>	Technical Specifications
<i>EXHIBIT 7:</i>	Instruction Manual

# INTERTEK TESTING SERVICES

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## MEASUREMENT/TECHNICAL REPORT

### Signal Communications Ltd.

**Brand Name/ Model:** TeleEye/ VR-16168, VR-16084, VR-8084, VR-8042, VR-4042, VR-4021  
CAMERIO/VR-16168, VR-16084, VR-8084, VR-8042, VR-4042, VR-4021

**FCC ID: NAGSCVR-020730**

**August 15, 2002**

This report concerns (check one:)      Original Grant  Class II Change

Equipment Type: Computer Peripheral (example: computer, printer, modem, etc.)

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Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?      Yes       No

If yes, defer until: \_\_\_\_\_  
date

Company Name agrees to notify the Commission by: \_\_\_\_\_  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37?      Yes       No

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [12-18-01 Edition] provision.

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Report prepared by:

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## INTERTEK TESTING SERVICES

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## INTERTEK TESTING SERVICES

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### List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated photos.doc
Test Setup Photo	Conducted Emission	conducted photos.doc
Test Report	Conducted Emission Test Result	conducted.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Change in Applicant's Address	change.pdf

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**INTERTEK TESTING SERVICES**

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**EXHIBIT 1**

**GENERAL DESCRIPTION**

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### 1.0 General Description

#### 1.1 Product Description

The Equipment Under Test (EUT) is a video recording transmitter which is a one-plug module on LAN and the Internet for remote video monitoring and recording. The EUT is powered by AC 100-240V 50-60Hz input, DC 12V output adaptor. It provides simultaneous remote monitoring, recording and playback. Users can keep track of live video and play back recorded video from any remote locations. It can support up to 16 video and alarm inputs and 4 relay switches. Also it has the features of password protection on connection and settings and built-in real time clock.

The Models bearing the following model numbers have the following difference:

<u>Model No.</u>	<u>Features</u>
VR-4021	Support 4 video channels, 4 alarm inputs, 4 output switches and 20G hard disk.
VR-4042	Support 4 video channels, 4 alarm inputs, 4 output switches and 40G hard disk.
VR-8042	Support 8 video channels, 8 alarm inputs, 4 output switches and 40G hard disk.
VF-8084	Support 8 video channels, 8 alarm inputs, 4 output switches and 80G hard disk.
VR-16084	Support 16 video channels, 16 alarm inputs, 4 output switches and 80G hard disk.
VR-16168	Support 16 video channels, 16 alarm inputs, 4 output switches and 160G hard disk.

The transmitter's features will be enabled by both software and hardware as indicated in block diagram and circuit diagram. The difference in these models is in the No. of encoder PCB, and necessary component but same PCB layout in main board with different capacity hard disk.

The VR-16168 is full component version with the highest capacity hard disk.

For electronic filing, the brief circuit description is saved a filename: descri.pdf.

#### 1.2 Related Submittal(s) Grants

This is a single Application for Certification.

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### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

### 1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

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**EXHIBIT 2**

**SYSTEM TEST CONFIGURATION**

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### 2.0 System Test Configuration

#### 2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in C63.4 (1992.)

The EUT was powered from AC 100-240V 50-60Hz input, DC 12V output adaptor.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The model VR-16168 is the full version and its test data is demonstrated on the report.

#### 2.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained in a CD ROM, was inserted into CD Drive and was installed into the hard disk.

Once the program was loaded, the cameras will capture images and the images will be shown on the monitor and recorded in the hard disk.

#### 2.3 Special Accessories

Shielded cables are necessary for compliance of this product.

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### 2.4 Equipment Modification

Any modifications installed previous to testing by Signal Communications Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

### 2.5 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

### 2.6 Support Equipment list & Description

Refer List:

1. HP Computer: Model: D3397A  
S/N: SG54500246  
FCCID: K4UVECTRAVL5
2. Hitachi Monitor: Model: CM643ET
3. HP Mouse: Model: M-S34  
S/N: LCA53438640  
FCCID: DZL210582
4. HP Printer: Model: C2642A  
S/N: SG67B131RY  
FCCID: B94C2642X
5. CD-Rom: Model: CDU311  
S/N: 5049187  
FCCID: AK8CDU31110
6. HP Keyboard: Model: E03633QLUS  
FCCID: CIGEO3614
7. NTSC Camera with 1.6m cable and adaptor  
Input: AC 240V 50Hz 19VA  
Output: DC 9V 1000mA
8. Alarm Box
9. 2 x RS232 mini tester
10. 2 x 9 pins to 25 pins RS 232 converter
11. 1 x shielded parallel cable with 1m long
12. 1 x shielded RJ45 LAN cable with 3.4m long
13. 4 x 8m shielded BNC cable with 75ohm terminator
14. 11 x 3m shielded BNC cable with 75ohm terminator
15. 1 x 3.5m shielded RS232 cable for alarm & SW
16. 1 x 3m shielded modem cable
17. 1 x 3m shielded RS232 cable for AUX
18. Adaptor: Input: AC 100-240V 50-60Hz  
Output: DC 12V 5.0A 60W  
Model: UE60-120500SPA
19. Software: Tele Eye III+

*Confirmed by:*

*Derek Leung*  
Supervisor  
Intertek Testing Services  
Agent for Signal Communications Ltd.



Signature

August 15, 2002 Date

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**EXHIBIT 3**

**EMISSION RESULTS**

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### 3.0 Emission Results

Data included were result from worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs, data tables and graphical representations of the emissions are included.

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### 3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

where FS = Field Strength in  $\text{dB}\mu\text{V}/\text{m}$

RA = Receiver Amplitude (including preamplifier) in  $\text{dB}\mu\text{V}$

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

where FS = Field Strength in  $\text{dB}\mu\text{V}/\text{m}$

RR = RA - AG in  $\text{dB}\mu\text{V}$

LF = CF + AF in dB

Assume a receiver reading of 52.0  $\text{dB}\mu\text{V}$  is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32  $\text{dB}\mu\text{V}/\text{m}$ . This value in  $\text{dB}\mu\text{V}/\text{m}$  was converted to its corresponding level in  $\mu\text{V}/\text{m}$ .

$$RA = 52.0 \text{ dB}\mu\text{V}/\text{m}$$

$$AF = 7.4 \text{ dB}$$

$$RR = 23.0 \text{ dB}\mu\text{V}$$

$$CF = 1.6 \text{ dB}$$

$$LF = 9.0 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = RR + LF$$

$$FS = 23 + 9 = 32 \text{ dB}\mu\text{V}/\text{m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(32 \text{ dB}\mu\text{V}/\text{m})/20] = 39.8 \mu\text{V}/\text{m}$$

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### 3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission

399.994 MHz

For electronic filing, the worst case radiated emission configuration photographs is saved with filename: radiated photo.doc

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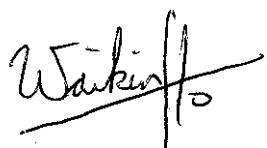
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### 3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 8.6 dB

#### ***TEST PERSONNEL:***



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*Tester Signature*

Ben W. K. Ho, Electronics Engineer  
*Typed/Printed Name*

August 15, 2002  
*Date*

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## INTERTEK TESTING SERVICES

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Company: Signal Communications Ltd.  
Model: TeleEye VR-16168

Date of Test: June 28, 2002

Table 1

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	50.008	27.9	11.7	16	23.6	40.0	-16.4
V	75.002	33.4	6.3	16	23.7	40.0	-16.3
H	150.007	34.1	11.9	16	30.0	43.5	-13.5
H	175.007	31.0	15.5	16	30.5	43.5	-13.0
H	200.006	35.6	11.8	16	31.4	43.5	-12.1
H	225.008	37.2	11.4	16	32.6	46.0	-13.4
H	300.014	34.1	14.3	16	32.4	46.0	-13.6
H	350.001	32.7	14.9	16	31.6	46.0	-14.4
H	399.994	38.0	15.4	16	37.4	46.0	-8.6

Notes:

1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Interconnecting cabling or wiring was connected to one of each type of functional port of the EUT, and each cable or wire was terminated in a device typical of actual usage. Additional connecting cables or wires were added to the EUT to determine the effect these cables or wires had on emissions from the EUT. The number of additional cables or wires were limited to the condition where the addition of another cable or wire did not significantly affect the emission level, i.e. varies less than 2 dB, provided that the emission level remains compliant. These additional cables or wires need not be terminated.

Test Engineer: Ben W. K. Ho

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### 3.4      Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration  
at  
0.550 MHz

For electronic filing, the worst case line-conducted configuration photograph are saved with filename: conducted photos.doc

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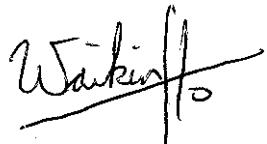
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### 3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgement: Passed by 5.3 dB

### **TEST PERSONNEL:**



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*Signature*

Ben W. K. Ho, Compliance Engineer  
*Typed/Printed Name*

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August 15, 2002

*Date*

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INTERTEK TESTING SERVICES

Company: Signal Communications Ltd.  
Model: TeleEye VR-16168

Date of Test: June 28, 2002

Graph 1

**Conducted Emissions  
Section 15.107 Requirements**

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INTERTEK TESTING SERVICES

Company: Signal Communications Ltd.  
Model: TeleEye VR-16168

Date of Test: June 28, 2002

Table 2

**Conducted Emissions  
Section 15.107 Requirements**

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**EXHIBIT 4**

**EQUIPMENT PHOTOGRAPHS**

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### 4.0 **Equipment Photographs**

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.doc & internal photos.doc

**EXHIBIT 5**  
**PRODUCT LABELLING**

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### 5.0 Product Labelling

For electronic filing, the FCC ID label and label location are saved with filename: label.pdf.

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**EXHIBIT 6**

**TECHNICAL SPECIFICATIONS**

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### 6.0 Technical Specifications

For electronic filing, the block diagram and schematics of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

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**EXHIBIT 7**

**INSTRUCTION MANUAL**

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### 7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.