S1100 User Manual

VERINT
POWERING ACTIONABLE INTELLIGENCE™

S1100

Firmware Release 3.30

User Manual

Verint Video Solutions

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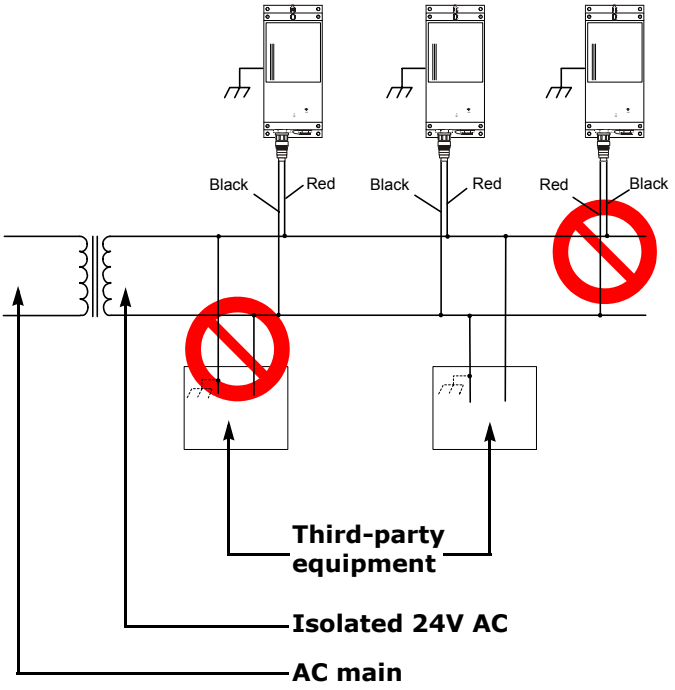
Warning: If you connect multiple S1100 units on the same 24V AC power source, always wire them the same way: The red power wires (VIN) of all units must be on the same terminal or lead of the AC power source. This is because the black power wire (VIN_RETURN) of the S1100 is internally connected to the S1100 chassis (earth). Swapping the power connection scheme from unit to unit will short out the AC power source.

Warning: If you connect third-party equipment with an earth-referenced power input, it is important to plug the earth-referenced terminal of that device to the same AC power source terminal as the S1100 black wire. Failing to do so will short out the AC power source.



Contents

Preface

The *S1100 User Manual* presents the information and procedures for installing, configuring, and using the SmartSight® S1100 wireless video systems.

Who Should Read this Manual

This manual is intended for managers, engineers, and technicians who will use the S1100 units. It provides conceptual information on how to configure, install, and operate the units.

This manual assumes that you are familiar with:

- Installation and manipulation of electronic equipment
- General use of computers
- Microsoft Windows operating systems
- Pan-tilt-zoom (PTZ) platforms (cameras and keyboards)
- Radio frequency (RF) regulations

How to Use this Manual

The *S1100 User Manual* contains all the information needed to install, configure, and use an S1100 unit.

Contents

This manual is divided into the following chapters:

1. **Overview**—Provides a brief description of the features of the S1100 unit and an illustration of its casing.
2. **System and RF Planning**—Lists the available frequency bands and describes planning operations relative to system setup and radio frequency (RF).
3. **Configuring and Installing the Unit**—Presents the configuration and installation procedures for the S1100 unit.
4. **Using the Configuration Assistant**—Explains how to program the S1100 unit using the SmartSight Configuration Assistant.
5. **Understanding the On-Screen Display**—Presents the four quadrants on the video monitor connected to the S1100 receiver unit.

6. **Updating the Firmware**—Describes how to upgrade the firmware of the S1100 unit.

The manual also includes the following appendixes:

A. **Factory Default Configuration**—Lists the default parameter values of the S1100 unit.

B. **Cable Descriptions**—Describes the 8-pin and 9-pin cables supplied with the unit.

C. **DTE and DCE Connections**—Presents diagrams explaining how to differentiate and connect data terminal equipment (DTE) and data communication equipment (DCE).

D. **Surge Protection**—Describes how to protect the S1100 unit from voltage and current surges.

E. **RF Contact between Masters**—Explains how to ensure that two master units "see" each other.

F. **Separation Between Units Using Adjacent Channels**—Lists the minimum distances between units using adjacent frequency channels.

G. **Technical Specifications**—Lists the complete technical specifications of the S1100 units.

A glossary, an index, and compliance information complete the manual.

Conventions

The following typographic conventions are used throughout this manual:

Visual cue	Meaning
Connect	The name of an interface element you have to act on. A key to press. The value of an interface element.
Advanced > **VSIP**	Any sequence of steps (in the menu structure of a graphical application, in the navigation structure of a web site, and so on).
connection_name	Text that must be replaced by a user-supplied value. Text representing variable content.
`S1100.xh`	The name of a command, file, or directory. Text that appears on the screen. Examples of user-supplied values.

Related Documentation

In addition to this manual, the following documentation is also available:

- *S1100 Installation Guide*—Contains the configuration steps and the installation procedure for the S1100 unit.
- *SConfigurator User Manual*—Presents the instructions on how to use a proprietary Verint Video Solutions software to perform advanced configuration tasks.
- *Release Notes*—Contain information about S1100 upgrades and known issues still under investigation, as well as a description of features not covered in this version of the documentation.

All these documents are contained on the *SmartSight Utilities* CD shipped with the unit. Furthermore, a paper copy of the installation guide is included with your order.

Related Verint Video Solutions Products

You can use the S1100 units with the S3100 outdoor wireless bridge. For more details about this product, visit our web site. For pricing information, call your dealer.

About Us

Verint Systems (NASDAQ: VRNT) is a leading global provider of video security, surveillance and business intelligence solutions. Verint Video Solutions transform digital video into actionable intelligence: timely, mission-critical insights for faster, more effective decisions.

Today, more than 1000 companies in 50 countries use Verint Systems solutions to enhance security, boost operational efficiency, and fuel profitability.

Web Site

For information about the SmartSight line of products, visit www.verint.com/smartsight. To download the product specifications, application notes, and user documentation, as well as to request the latest versions of firmware and software, use the following links:

To access	Visit
Complete selection of what is available:	www.verint.com/smartsight/support
User documentation:	www.verint.com/smartsight/manuals
Various tools and demos:	www.verint.com/smartsight/tools
Firmware upgrade requests:	www.verint.com/smartsight/firmware_upgrade

Support

If you encounter any type of problem after reading this manual, contact your local distributor or Verint Video Solutions representative. You can also use the following sections on our web site to find the answers to your questions:

To access	Visit
Technical support request form:	www.verint.com/smartsight/request
Solution database (FAQ):	www.verint.com/smartsight/faq
Login to our customer service system:	www.verint.com/smartsight/account

Verint Video Solutions technical support personnel is available to help you use your SmartSight units and the related software:

- On the web: www.verint.com/smartsight/request
- By phone: 1 888 494-7337 (North America) or +1 450 686-9000 Monday to Friday, from 8:30 to 17:30 EST
- By fax: +1 450 686-0198

Warranty

Each product manufactured by Verint Systems is warranted to meet all published specifications and to be free from defects in material and workmanship for a period of two (2) years from date of delivery as evidenced by the Verint Systems packing slip or other transportation receipt. Products showing damage by misuse or abnormal conditions of operation, or which have been modified by Buyer or repaired or altered outside Verint Systems factory without a specific authorization from Verint Systems shall be excluded from this warranty. Verint Systems shall in no event be responsible for incidental or consequential damages including without limitation, personal injury or property damage.

The warranty becomes void if the product is altered in any way.

Verint Systems responsibility under this warranty shall be to repair or replace, at its option, defective work or returned parts with transportation charges to Verint Systems factory paid by Buyer and return paid by Verint Systems. If Verint Systems determines that the Product is not defective within the terms of the warranty, Buyer shall pay all handling and transportation costs. Verint Systems may, at its option, elect to correct any warranty defects by sending its supervisory or technical representative, at its expense, to customer’s plant or location.

Since Verint Systems has no control over conditions of use, no warranty is made or implied as to suitability for customer’s intended use. There are no warranties, expressed or implied, except as stated herein. This limitation on warranties shall not be modified by verbal representations.

Equipment shipped ex works Verint Systems factory shall become the property of Buyer, upon transfer to the common carrier. Buyer shall communicate directly with the carrier by immediately requesting carrier’s inspection upon evidence of damage in shipment.

Buyer must obtain a return materials authorization (RMA) number and shipping instructions from Verint Systems prior to returning any product under warranty. Do not return any Verint Systems product to the factory until RMA and shipping instructions are received.

1

Overview

The S1100 is a professional video transmission product designed for the CCTV (closed circuit television) market. It allows digital video transmission over multiple license-free bands. It delivers high-quality MPEG-4-based video at 30 frames per second in NTSC (25 in PAL). This wireless system is built on open standards to provide long-term investment protection.

Note: The S1100 units require professional installation.

About the S1100

Each S1100 system consists of a video transmitter (-T) and a video receiver (-R) unit. Unless otherwise specified, the word *S1100* refers to any of these units.

Each unit is configured to operate, right out of the box, with the most popular camera data port configuration (4800 baud, 8 data bits, no parity, 1 stop bit).

The S1100 covers the 2.4 GHz and 5 GHz frequency bands in North America and Europe.

You can buy 12V DC and 24V AC units. A unit pair does not need to have the same input voltage.

Security

Every S1100 unit includes the SDCF (SmartSight distributed coordinated function) security feature. This proprietary MAC (media access control) protocol uses AES encryption with key rotation over the wireless link to secure the audio and video communication between the units.

Video

The S1100-R unit has one video output. The S1100-T has one video input with two encoders; by default, only one encoder is available.

The video frame rate of the units can be:

- NTSC—1 to 7, 10, 15, or 30 frames per second (fps)
- PAL—1 to 6, 8, 12, or 25 fps

The S1100 units can have the following video resolutions and maximum frame rates (in frames per second):

Resolution	Number of columns	Number of lines		Maximum frame rate	
	NTSC/PAL	NTSC	PAL	NTSC	PAL
QCIF	176	128	144	30	25
CIF	352	240	288	30	25
2CIF	352	384	448	30	25
2CIFH	704	240	288	30	25
4CIF	704	480	576	15	12
All lines	352	480	576	30	25
2/3 D1	480	480	576	15/30 *	12/25 *
VGA	640	480	576	15/30 *	12/25 *

* Without noise, I/Os, and other factors affecting quality, the unit can achieve the highest frame rate.

Shipment

Your S1100 shipment contains the following items:

- The requested transmitter and receiver, each coming with an integrated patch antenna (with a gain of 8.5 dBi in the 2.4 GHz band or 13 dBi in the 5 GHz band)
- Two wall mount bracket sets, already installed on the units
- Two pole mount bracket sets
- Two cable assemblies for video, power, and serial port (*CAB9P*)
- The *SmartSight Utilities* CD containing the documentation and release notes for the unit
- The *S1100 Installation Guide*
- This user manual

The shipment may also contain the following options:

- One or two high-gain antennas

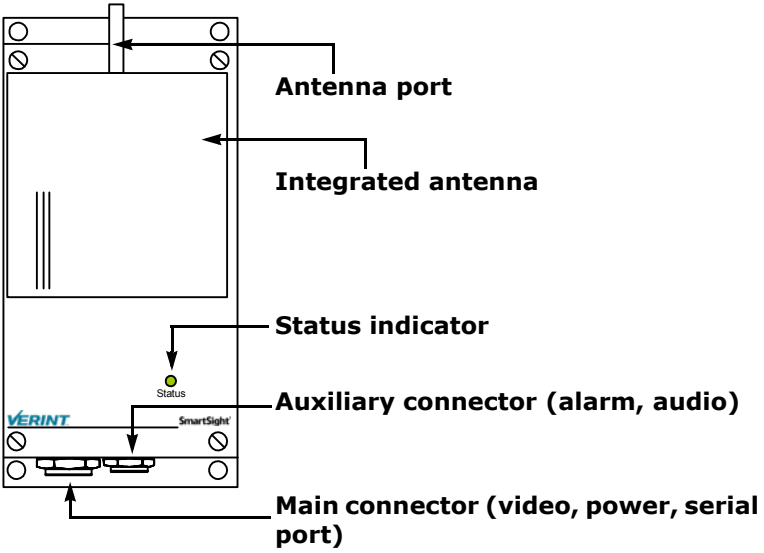
  Warning: When choosing antennas, you must ensure that the combined transmission power of the unit and antenna does not exceed the maximum power established by your country's regulations. For more information, see page 20.

- One or two junction boxes (*JBOX*)
- One or two alarm/audio cable assemblies (*CAB8P*)
- One or two power supplies

  Note: If you are using power supplies other than those supplied by Verint Video Solutions, you need to ensure that they have a minimum capacity of 1A (12V DC) or 30 VA (24V AC).

Casing Description

The S1100 electronics are enclosed in a weather-tight cast aluminum module. All cable entries are mounted on the underside of the module to maintain its weatherproof properties. The front panel integrates one bicolor visual indicator that illustrates the unit's operational state.



2

System and RF Planning

For best operation, you must carefully plan the setup and location of your radio systems and antennas. Planning is especially required if you want to install many systems in the same area, in order to prevent radio interference between the colocated units. In all cases, follow the recognized RF installation practices.

One radio system is a receiver and a transmitter using the same wireless passkey.

Frequency Bands and Channels

The S1100 supports communications in the following frequency bands, in North America and Europe:

- 2.4 GHz OFDM, also known as 802.11g
- 5 GHz OFDM, also known as 802.11a

2.4 GHz Band

The 2.4 GHz band provides 11 channels in North America and 13 in Europe. In these two regions, only channels 1, 6, and 11 are non-overlapping. All these channels are for indoor or outdoor use. The center frequencies of the channels are:

Channel	Frequency (GHz)	Channel	Frequency (GHz)
1	2.412	8	2.447
2	2.417	9	2.452
3	2.422	10	2.457
4	2.427	11	2.462
5	2.432	12	2.467 (Europe only)
6	2.437	13	2.472 (Europe only)
7	2.442		

5 GHz Band

In the 5 GHz band, the number of available channels and sub-bands vary depending on the country of operation.

Most European countries adhere to the DFS (dynamic frequency selection) and TPC (transmit power control) regulations established by the European Telecommunications Standards Institute (ETSI); these regulations apply to the 5 GHz frequency band only. To know which bands are available in your country of operation and whether your country adheres to DFS and TPC, refer to the *Wireless Frequency Plan* document located on our web site (Tools & Demos section).

In North America, nine channels are available in the 5 GHz band, all non-overlapping and for indoor or outdoor use. The center frequencies of these channels are:

Channel	Frequency (GHz)	Channel	Frequency (GHz)
52	5.26	149	5.745
56	5.28	153	5.765
60	5.30	157	5.785
64	5.32	161	5.805
		165	5.825

In Europe, the 11 non-overlapping channels, for indoor or outdoor use, are:

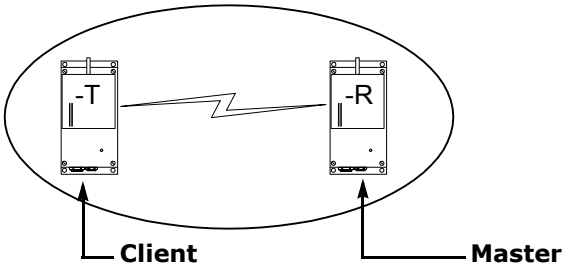
Channel	Frequency (GHz)	Channel	Frequency (GHz)
100	5.50	124	5.62
104	5.52	128	5.64
108	5.54	132	5.66
112	5.56	136	5.68
116	5.58	140	5.70
120	5.60		

Wireless Cells

A wireless network is designed such that information can travel back and forth between two points without the need for wires. Wireless devices are grouped into *wireless cells*. The devices in a cell communicate together on the same frequency channel and share the same wireless passkey.

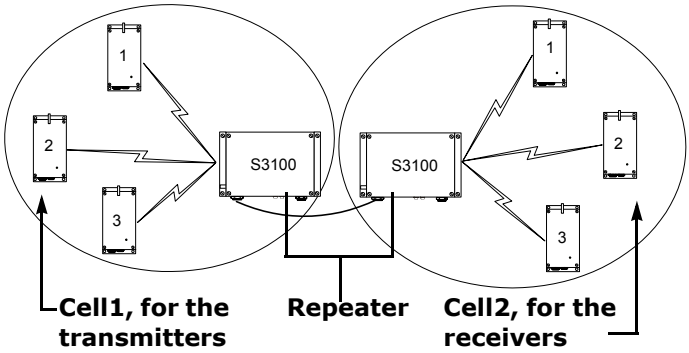
You can use the S1100 units in two types of applications:

- Point-to-point system, which requires a single wireless cell:



  The S1100 receiver is the SDCF master, and the transmitter is the client.

- Point-to-point repeater, which is the combination of two wireless cells:



When planning your wireless systems, you have to take into account the firmware versions of the involved units:

- The two S1100 units making up a pair must have the same firmware version.

- In a point-to-point repeater, it is recommended that the S1100 units have the same firmware versions as their associated S3100 master. Use the following matrix to ensure complete compatibility between your units:

		S1100	
		V3.20	**V3.30**
Master S3100	**V2.55**	no	no
	V2.56	no	no
	V2.60	yes	yes
	V3.20	yes	yes
	V3.30	yes	yes

As far as updating the firmware, you should:

1. Update the firmware of all S1100 pairs, starting with the remote unit.
2. Change the IP address of the computer running SConfigurator (refer to the *S3100 User Manual*).
3. Update the firmware of the two S3100 units.

TPC

If the country of operation of the S1100 unit requires conformity to the TPC (transmit power control) regulations, the transmission power of its radio is automatically reduced by 3 dB before leaving the Verint Video Solutions factory. However, in case of a weak wireless link (that is, a link with an RF margin of less than 15 dB), you have the opportunity to use the maximum transmission power (see page 46).

DFS

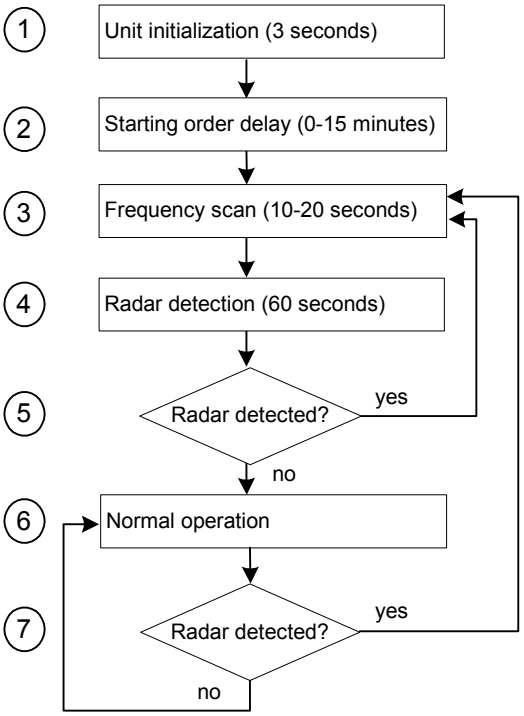
To follow the DFS (dynamic frequency selection) regulations specified by ETSI for the selected country, it is the master unit that performs the tasks relative to frequency channel selection and radar detection. In other words, you cannot choose the frequency channel on which the unit will run.

The automatic selection of the frequency channel limits the number and the configuration of the wireless cells. Furthermore, when colocating many cells, all masters must "see" each other.

Note: DFS is required only in the 5 GHz band.

You should start the master first, then power the client when the other unit is in normal operation.

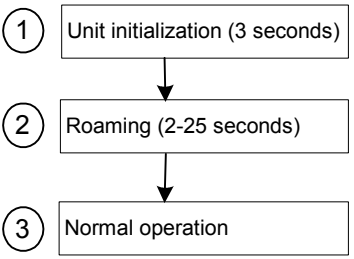
A master unit in DFS mode goes through the following sequence when booting up:



1. The unit goes through the standard startup procedure.
2. The starting order delay ensures that colocated masters will not select a frequency channel at the same time, therefore minimizing the possibility that they choose the same one. For more information about the starting order, see page 45.

3. The unit scans the available frequencies (based on the selected country) and automatically selects a channel. In the selection process, channels already used by colocated masters will be discarded at first.
4. The unit listens for 60 seconds on the selected channel to detect possible radar interference.
5. If a radar is detected on the channel, the unit returns to the scan process. Otherwise, it continues its bootup procedure.
6. The unit runs normally.
7. If a radar is detected, the unit immediately goes back to the scan process to select another channel.

The boot sequence of client (transmitter) units is:



1. The unit goes through the standard startup procedure.
2. The unit roams through the channels in the available frequency bands to locate its master.
3. When the master is located, the client unit runs normally on the selected frequency channel.

Colocated Systems

When installing colocated systems, you have to carefully plan the position of the units in order to prevent radio interference. You can operate many wireless cells in the same location, provided you follow guidelines relative to frequency band and channel, distance, wireless passkey, and location.

Regarding frequency channel, you cannot manually select one in the 5.40–5.725 GHz band in Europe; for the detailed procedure, see page 15.

The wireless passkeys of colocated cells must be different from one another, regardless of their frequency channels.

Distance Limitations

The distance limitations between units are:

- To avoid material damages, you must never power any two units while their antennas are facing one another with a distance of less than 10 feet (3 meters).
- If using adjacent channels, see page 81 for the recommendations on the minimum distances to respect.
- With different frequency bands or with non-adjacent channels in the same band, two units can be side by side with no minimum distance between them.

2.4 GHz Band

In the 2.4 GHz band in North America and Europe, you can use the three non-overlapping channels (channels 1, 6, and 11) to colocate wireless cells.

Up to Three Point-to-Point Systems

As long as you follow the recognized RF installation practices, you can colocate three S1100 point-to-point systems without special consideration for antenna placement and type. You simply have to:

1. Assign a unique wireless passkey to each system.
2. Assign channel 1 to one system, channel 6 to the second system, and channel 11 to the last system. For example:

Unit	Channel	Wireless passkey
S1100-T 1	1	1dfi340mndpha23v
S1100-R 1	1	1dfi340mndpha23v
S1100-T 2	6	pvaeodmq820pasqs
S1100-R 2	6	pvaeodmq820pasqs
S1100-T 3	11	moxsa41o0s3n7azx
S1100-R 3	11	moxsa41o0s3n7azx

Up to Six Point-to-Point Systems (< 180° Coverage)

You can install up to six S1100 receivers on the same side of a building or on the same mast, with their antennas pointing within the same direction (within a 180° angle of each other). You have to:

1. Assign a unique wireless passkey for each system.
2. Assign the same channel to two adjacent pairs of units. Assign the channels in the following order: 1, 11, 6.

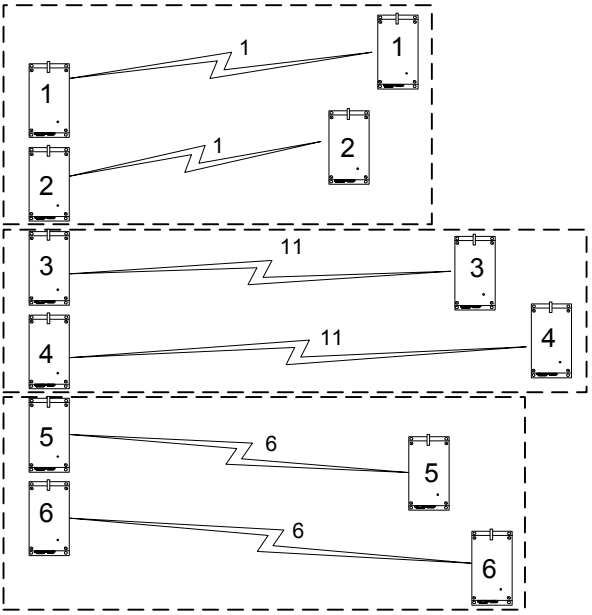
   For example:

Unit	Channel	Wireless passkey
S1100-T 1	1	1570fullummtlh2k
S1100-R 1	1	1570fullummtlh2k
S1100-T 2	1	270citehullj8y2h
S1100-R 2	1	270citehullj8y2h
S1100-T 3	11	yyyypu76leplep11
S1100-R 3	11	yyyypu76leplep11
S1100-T 4	11	jyjyjypkpkpkbxbx
S1100-R 4	11	jyjyjypkpkpkbxbx
S1100-T 5	6	zxcvbnmlkjhgfdsa
S1100-R 5	6	zxcvbnmlkjhgfdsa
S1100-T 6	6	qwertyuioplkjhgf
S1100-R 6	6	qwertyuioplkjhgf

3. Set the RF bit rate of each system sharing a channel to a high enough value to accommodate the cumulative video throughput configured in both systems.

   This higher value is required because the systems sharing the same channel will also share the available radio channel bandwidth.

4. Install the individual receivers that share a channel as close as possible to each other; do the same for the two corresponding transmitters. All units sharing a channel must have a clear RF line of sight to each other (that is, no "hidden node"); they must also "hear" each other. For instance, transmitter 1 must be able to hear both receivers and transmitter 2.



If the distance between the transmitters sharing a channel is greater than 300 feet (91.5 meters), call the Verint Video Solutions systems engineering group for help.

5 GHz Band in North America

All channels in the 5 GHz band are non-interfering.

Up to Nine Point-to-Point Systems

As long as you follow the recognized RF installation practices, you can install up to nine S1100 point-to-point systems in colocation mode, on the same pole or on different sides of a building, without sharing channels.

You have to:

1. Assign a unique wireless passkey to each system.
2. Assign an available channel to each required system.

   When assigning the channel numbers, alternate between the 5.3 and 5.8 GHz bands and use ascending order for each band (for example, channel 52 for the first system, channel 149 for the second, channel 56 for the third, and so on).

Up to 16 Point-to-Point Systems (< 180° Coverage)

You can install up to 16 S1100 receivers on the same side of a building or on the same mast. To do so, the receivers must be pointing within the same direction (within 180° direction of each other).

For the installation steps, adapt the procedure described on page 13, "Up to Six Point-to-Point Systems (< 180° Coverage)", with the 5 GHz band data.

5 GHz Band in Europe

The maximum number of colocated cells corresponds to the number of channels in the available frequency bands that can be used outdoors. For instance, in most countries of Western Europe, you can have up to 11 colocated cells in the 5.40–5.725 GHz band. However, because the master units must see each other in a DFS context, the variety of supported setups is limited.

In this context, you can easily install up to five cells. By respecting the following steps, you can assume that the cells will not share the same frequency channel, making the complete bandwidth available for each one. You have to:

1. Assign a different wireless passkey to each cell.
2. Ensure that all S1100 masters "see" one another. For the procedure, see Appendix E on page 77.
3. Position the units so that there is at least 3 feet (1 meter) between each antenna.

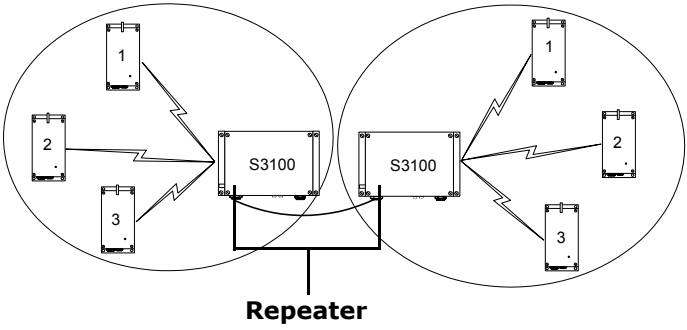
4. In each master unit, set a different starting order: 1 for the first unit, 2 for the unit next to it, 3 for the third one, and so on.

Installing more than five cells in the 5.40–5.725 GHz band requires the use of adjacent channels. This situation demands greater distances between the antennas to reduce potential radio interference. Therefore, you should contact the Verint Video Solutions project engineering group for assistance.

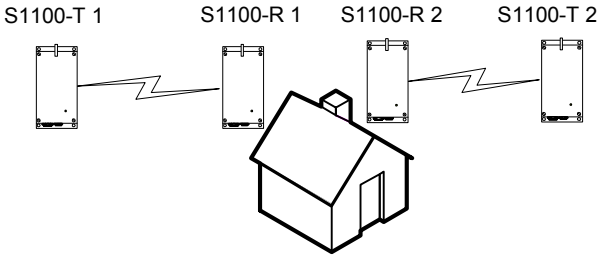
Supported Setups

The following colocated systems are supported in the 5.40–5.725 GHz band:

- A point-to-point repeater for one or more pairs of S1100 units, with or without hidden nodes. The two S3100 master units see each other.



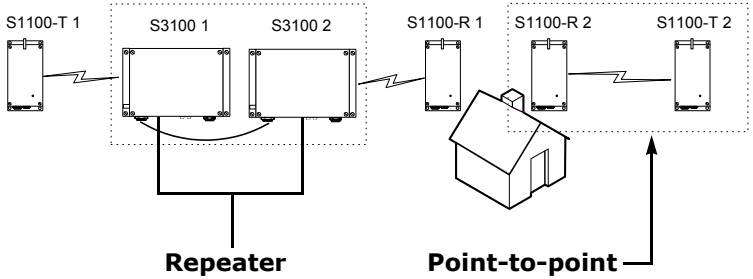
- Multiple point-to-point applications. The S1100 master units (the receivers) see each other.



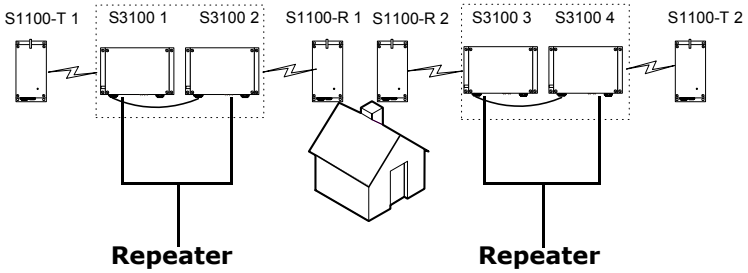
Unsupported Setups

You cannot install the following colocated systems in the 5 GHz band in Europe:

- A point-to-point repeater with a point-to-point link. In this setup, there are two masters that do not see each other, S3100 2 and S1100-R 2, while the two receivers do.



- Multiple point-to-point repeaters. The S3100 2 and S3100 3 masters do not see each other, while the two receivers do.



RF Planning

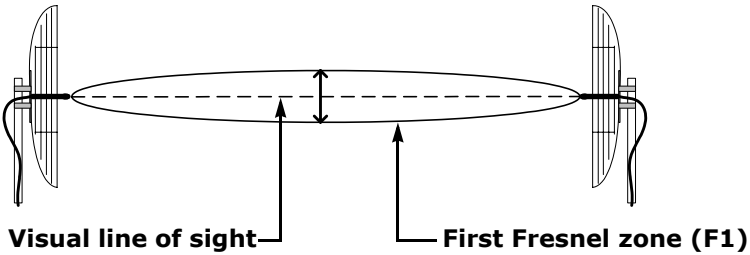
Successful operation of a wireless link depends on proper RF path planning and antenna installation. You have to install the units in such a way that there is a clear RF line of sight between the two antennas.

Location Evaluation

The path between the two antennas must be free of obstacles that could disturb propagation. For very short link distances—less than 500 feet (152 meters)—you may be able to establish a working link despite partial path obstruction. However, radio waves will be in part absorbed and in part diffracted by the obstacles, therefore affecting link reliability. Because the reliability of such an installation is highly unpredictable, Verint Video Solutions does not recommend it. A path free of any obstacle is called an *RF line-of-sight path*.

To establish an RF line-of-sight path, you must take into account the beam width of the radio signal transmitted between the two antennas. This beam width is an elliptical area immediately surrounding the visual line of sight. It varies in thickness depending on the length of the signal line of sight; the longer the length, the thicker the beam width becomes.

The region outlined by the signal beam width is known as the *first Fresnel zone*. The Fresnel zone is always thicker at the mid-point between the two antennas. Therefore what appears to be a perfect line-of-sight path between the base and a remote station may not be adequate for a radio signal; this is the difference between "visual" and "RF" line of sight.



In practice, it has been determined that a radio path can be considered an RF line-of-sight path if it has a clear opening through 60% of the first Fresnel zone (or *0.6 F1*). Here are values for 0.6 F1 for various signal path distances and frequency bands:

Distance (mi./km)	2.45 GHz (feet/m)	5.3 GHz (feet/m)	5.8 GHz (feet/m)	Earth curvature effect (feet/m)
1 / 1.6	14 / 4.2	9.5 / 2.9	8.9 / 2.7	0
4 / 6.5	27 / 8.4	18.7 / 5.7	18 / 5.5	2 / 0.6
7 / 11.3	37 / 11	25 / 7.6	23.6 / 7.2	6 / 1.8
15 / 24	53 / 16	36.4 / 11.1	35 / 10.6	29 / 8.8

For distances under seven miles, the earth curvature effect is negligible. However, for greater distances, you need to consider it in your calculations; for instance, for a 15-mile link in the 2.4 GHz band, the two antennas must be located 82 feet higher than the highest obstacle in the RF line of sight between them (that is, 53 feet for the Fresnel zone plus 29 feet for the earth curvature effect). For help, consult the Verint Video Solutions project engineering group.

A common problem encountered in the field and related to the 0.6 F1 clearance rule is building obstruction. The proposed visual path may just barely clear a building but the RF line of sight will not. In such a case, the signal will be partially absorbed and diffracted. Increasing the height of the two antennas or the gain of the antennas are the only alternatives to improve the link quality.

Note: At 2.4 and 5 GHz, radio waves are highly attenuated by dense foliage. A link established in the fall or winter season may be adversely affected in the spring and summertime, if it is established below tree level.

Antenna Requirements

Verint Video Solutions offers many antennas to meet various distance requirements.

You have to consider many factors when choosing an antenna, including the distance to cover, the RF bit rate, the radiated power (EIRP), and the frequency band used. For systems located in North America on the 5 GHz band, you can use the *Wireless Distance Calculator* located on our web site (Tools & Demos section).

The combined transmission power of the unit and antenna must not exceed the maximum value established by your country's regulations. To ensure that this maximum is not exceeded, enter the gain of the chosen antenna in the Configuration Assistant (Wireless section). The unit will automatically take it into account and adjust its own transmission power accordingly at startup.

To know the maximum antenna gain you can use, subtract a value from the maximum EIRP allowed (in dBm):

Frequency band	Value to subtract from EIRP
2.4 GHz in North America	11 dB
2.4 GHz in Europe	11 dB
5 GHz with DFS/TPC	12 dB
5 GHz without DFS/TPC	6 dB

The maximum EIRP varies depending on your country and band; for more information, refer to the *Wireless Frequency Plan* document located on our web site (Tools & Demos section). In North America for instance:

Frequency band	Maximum transmitted power of the unit	Maximum radiated power (EIRP)
2.4 GHz	18 dBm	30 dBm
5.3 GHz	17 dBm	30 dBm
5.8 GHz	17 dBm	36 dBm in point to multipoint 53 dBm in point to point

For example, consider a unit running in the 5.3 GHz band in North America. Since the maximum EIRP allowed in this area is 30 dBm, you should not install an antenna whose gain is greater than 24 dBi (that is, 30 dBm - 6 dB).

Note: Connecting an antenna with a gain higher than the calculated value contravenes your country's regulations. It is your responsibility to ensure that you respect the regulations in place.

Interference

In most countries, the 2.4 GHz band is not regulated by a government agency; this absence of frequency coordination can result in interference between various systems. For instance, if a link with an RF line of sight is subject to excessive video delay and very low frame rate (or possibly breakdown of video images), it could be due to interference.

Fortunately, you have ways of adapting your setup to avoid interference:

- RF channel selection—In the 2.4 GHz band, the S1100 has 11 or 13 channels to choose from. In case of interference, it is recommended to change channel until you find a clean one.
- Antenna selection—Replacement of the integrated antenna by a higher gain one can significantly lower the interference from other radio systems. Replace the antenna if switching channels does not correct the problem or if all channels must be used to colocate several systems.

The 5 GHz band is less cluttered than the 2.4 GHz band, resulting in less potential interference from other wireless systems.

RF Exposure Considerations

In order to comply with the RF exposure requirements of CFR 47 part 15 in North America, the units must be installed in such a way as to allow a minimum separation distance of 12 inches (30 cm) between antennas and persons nearby.

3

Configuring and Installing the Unit

To prepare your S1100 system for operation, the steps to follow are:

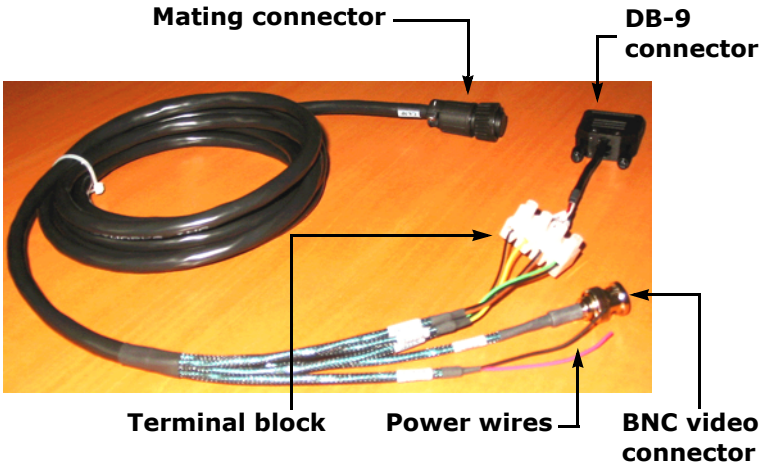
- Basic configuration, mainly for radio frequency (RF) and serial connection
- Physical installation in its final location
- Alarm and audio configuration, if required

Two types of applications are covered:

- Point-to-point system between a transmitter and a receiver
- Point-to-point repeater, with the S3100 outdoor wireless bridge

Cable for Power, Video, and Serial Data

The supplied CAB9P cable assembly is used for video, power, and serial port connection.



For the detailed pinout, see page 68.

Serial Port

The S1100 integrates one multipurpose serial port. This port is used for system configuration and data communication: pan-tilt-zoom (PTZ), access control, or other. By default, the port automatically detects if it is connected to an RS-232 or RS-422/485 serial device.

The CAB9P cable is supplied with a female DB-9 plug enabling RS-232 connections. However, most PTZ cameras, keyboards, and similar devices use RS-422/485 connections. Therefore, you will have to adapt the CAB9P cable for its different uses:

- During the configuration process of the S1100, you need to access a computer, so the DB-9 connector is required for RS-232 communication.
- Later, when installing the unit in its final location, you will likely want to connect it to RS-422/485 equipment, therefore requiring changes on the cable.

You should keep the DB-9 connector on the cable for later use and plug the RS-422/485 equipment on the terminal block.

Warning: At any time there must be only one serial device connected to the S1100 unit. For instance, when configuring the unit, you must unplug any RS-422/485 device from the terminal block.

Power

Use the red and black wire pair of the CAB9P cable to connect the S1100 unit to an external power supply.

In 12V DC, the red wire is for input and the black wire is for power ground. In 24V AC, both wires are used for power.

Computer Requirements

The minimum software and hardware requirements for the host computer needed to configure the unit are:

- Windows 2000 Service Pack 2 or higher, or Windows XP
- Administrator rights on the computer
- Internet Explorer 5.0 or higher
- A serial port (not through a USB converter)

Configuring a Point-to-Point System

To configure a point-to-point system, you connect one unit (typically the receiver) to a computer then specify a series of parameters that apply to both units. Then you check if RF communication works properly between the two units.

To configure a unit pair:

1. In a lab, unpack the receiver and the transmitter and set them on a table.

   Warning: To avoid material damages, you must never power any two units while their antennas are facing one another with a distance of less than 10 feet (3 meters).

2. Unpack the two cable assemblies (CAB9P) and connect each one to the main connector of a unit.

3. On the receiver, connect the DB-9 plug at the other end of the CAB9P cable to a COM port on your computer.

4. Power the receiver using the red and black wires of its CAB9P cable.

   For a description of the boot sequence in a DFS context, see page 10.

5. When the boot sequence of the receiver is completed, power the transmitter using the red and black wires of its cable.

6. Using the SmartSight Configuration Assistant tool, perform a basic setup on the pair of units (see page 42).

   - ☐ Ensure that the repeater mode is disabled.
   - ☐ Enter the wireless passkey of the units.

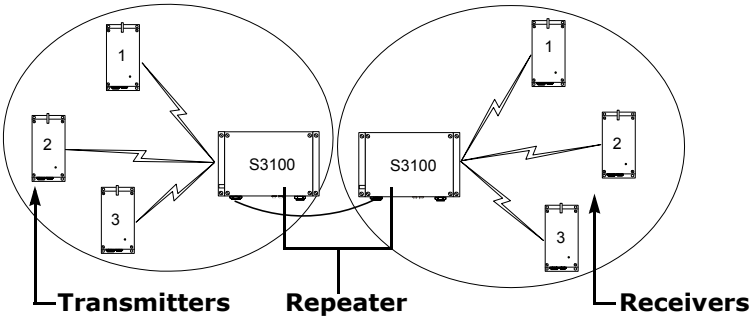
   Write down the values of the configuration parameters in the form located at the end of the *S1100 Installation Guide*.

7. Connect the external antennas, monitor, and camera to the units; ensure that RF and video communication works properly in your wireless system.

The initial configuration is now complete for the two units. You can now install them in their final location (see page 28).

Configuring a Point-to-Point Repeater

A point-to-point repeater is used as a range extender for wireless links, when you need a device to retransmit the signals coming from one or many S1100 transmitters to their corresponding receivers. A repeater is made up of two S3100 master bridges.



To configure a point-to-point repeater:

1. Configure the S1100 pair:

Warning: You must complete the configuration of the S1100 units before powering up an S3100 bridge.

a. In a lab, unpack the receiver and the transmitter and set them on a table.

Warning: To avoid material damages, you must never power any two units while their antennas are facing one another with a distance of less than 10 feet (3 meters).

b. Unpack the two cable assemblies (CAB9P) and connect each one to the main connector of a unit.

c. On the receiver, connect the DB-9 plug at the other end of the CAB9P cable to a COM port on your computer.

d. Power the receiver using the red and black wires of its CAB9P cable.

For a description of the boot sequence in a DFS context, see page 10.

e. When the boot sequence of the receiver is completed, power the transmitter using the red and black wires of its cable.

f. Using the SmartSight Configuration Assistant tool, perform a basic setup on the pair of units (see page 42).

- Enable the repeater mode.
- Enter a different wireless passkey for each unit.

Write down the values of the configuration parameters in the form located at the end of the *S1100 Installation Guide*.

As soon as these settings are saved, the units are not communicating anymore, since they have different wireless passkeys. The RF and video communication will be re-established after the repeater is fully configured.

2. Configure the two S3100 units making up the repeater. For the procedure, refer to the "Configuring a Point-to-Point Repeater" chapter in the *S3100 Installation Guide*.

Write down the values of the configuration parameters in the form located at the end of the *S1100 Installation Guide*.

You can now install the units in their final location (see page 28).

Installing the Equipment

After configuring successfully your S1100 units, you are ready to install them in their final location. The installation procedure can include the setup of external antennas.

To optimize your system radio performance, carefully review the site planning information presented in Chapter 2 on page 5.

Installing the S1100 Units

The installation procedure is the same for all units, regardless of their usage (with or without a repeater).

Warning: When installing colocated wireless systems, you have to take into account the distance limitations listed on page 12.

Warning: Always mount the unit with the mating connectors pointing downwards. Otherwise moisture may penetrate the unit; the associated repair costs are not covered by the warranty.

To install a pair of S1100 units:

1. To install a unit on a light pole or mast, use the pole mount brackets and stainless steel clamps provided with your shipment. For wall mounting, use the side brackets already installed on the unit.
2. If you are installing the S1100 equipment in a lightning prone environment or in a site where large AC mains power fluctuations are a common occurrence, add additional external surge protection to all vulnerable connections.

   In such environments, vulnerable connections are those that run for a long distance between the S1100 unit and the connected equipment. For more information, see the "Surge Protection" appendix on page 75.
3. If the S1100 equipment will be directly exposed to the sun in an environment likely to reach 122°F (50°C), install a sun shield.

   A derate of 13°F (7°C) is required to protect the equipment.
4. Install the external antenna, if required (see page 33).
5. Connect the CAB9P cables to the S1100 units.

   Ensure that the connectors are dry, to avoid corrosion.

   To properly install the cable connector on the unit, you have to turn until you feel a positive click.
6. Plug the BNC video connectors of the CAB9P cables on the target devices (camera or monitor).

7. Perform the serial connection to the target device (see page 31).

8. If you are using a junction box (*JBOX* code), route all wires to it first; then route the wires from the box to the target device.

9. Carefully align the antenna of each S1100 unit with that of its corresponding unit (S1100 or S3100) so that they have a clear RF line of sight.

10. Power up the units.

Here is an illustration of a pole mount installation of an S1100 unit with a dome:

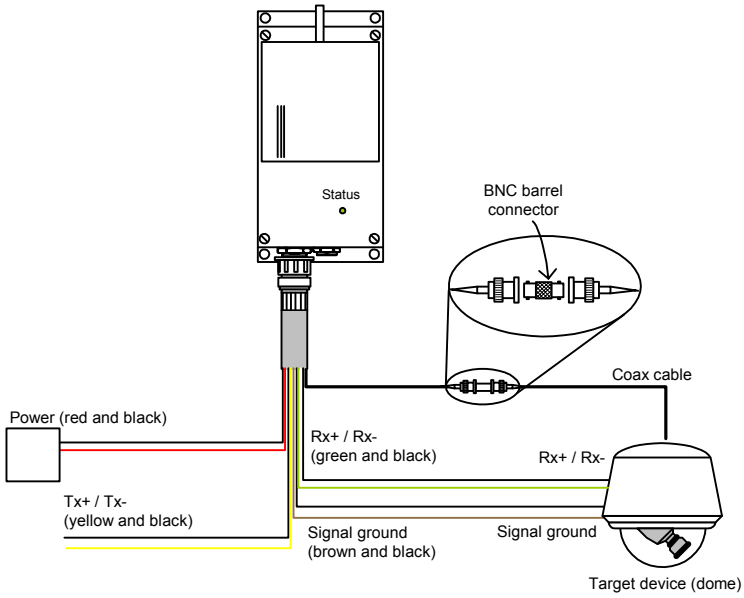
Performing the RS-422/485 Serial Connection

Most target devices (keyboards, PTZ cameras) that are likely to be linked to the S1100 units use the RS-422 or RS-485 serial protocol.

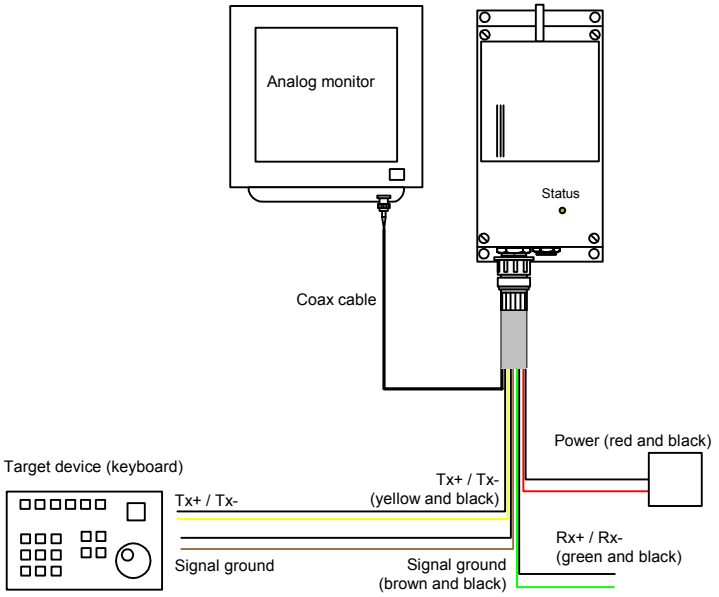
To connect the CAB9P cable to a device in an RS-422 2-wire, RS-422 4-wire, or RS-485 4-wire setup, use the following wiring scheme:

Cable			Target device
Signal name	**Wire pair**	**Wire color**	**Signal name**
Rx+	green/black	green	Rx+
Rx-		black	Rx-
Tx+	yellow/black	yellow	Tx+
Tx-		black	Tx-
Signal ground	brown/black	brown	Signal ground
Signal ground		black	Signal ground

These connections apply on both transmitter and receiver units. For example, here is an S1100 transmitter connected to a dome (PTZ) in an RS-422 2-wire context:



The corresponding receiver side is:



Some target devices require RS-485 2-wire half-duplex communication. Use the following wiring scheme on both units to achieve this setup. You also have to set the operating mode to **RS-485 2 Wires** and the line driver to **RS-422** (for details, see page 47).

Cable			**Target device**
Signal name	**Wire pair**	**Wire color**	**Signal name**
Data+	green/black	green	Data+
Data-		black	Data-
Signal ground	brown/black	brown	Signal ground
Signal ground		black	Signal ground

Adding an Antenna

If you bought a high gain antenna, install it after the unit is in place. The antennas provided by Verint Video Solutions are designed to be mounted on a mast or pole of 2–3 inch (5–7.5 cm) diameter.

To install an external antenna:

Warning: Even if you are using an external antenna, do not remove the integrated one; otherwise the warranty becomes void.

1. Install the antenna above the S1100 unit. If you bought your antenna from Verint Video Solutions, use the supplied pole mount bracket.
2. Screw the SMA connector of the antenna cable to the S1100 antenna port and tighten it with a 0.25 inch (0.6 cm) wrench.

   Warning: Do not over-tighten to avoid damaging the connector. The recommended torque is 8 lb-in. (100 N-cm). You could use a calibrated SMA torque wrench (for instance, from the Pasternack company, available at www.pasternack.com).
3. Apply two or three layers of electrical tape around all RF connections.

   The antenna cable and connectors are weather-tight; however, vibration caused by the wind will over time loosen the connectors and reduce the efficiency of the gaskets. The electrical tape will prevent this situation.
4. Carefully align the antenna with that of the other unit so that both have a clear RF line of sight.

Configuring the I/Os

To program alarms or use the audio features of the unit, you need the CAB8P cable assembly. For detailed pinout information, see page 70.

The S1100 supports two inputs and one output. Each signal has a dedicated purpose:

- Input 1—Either transparent alarm links (default) or PTL (push-to-listen) audio transmission mode. To switch between the two, see page 47.
- Input 2—Push-to-talk (PTT) audio transmission mode.
- Output—Relay for the input 1 signal in alarm mode.

You cannot program audio control and alarms at the same time, since input 1 is used in both contexts.

Audio

The S1100 unit supports two audio modes: full duplex and half-duplex bidirectional audio (that is, PTT/PTL).

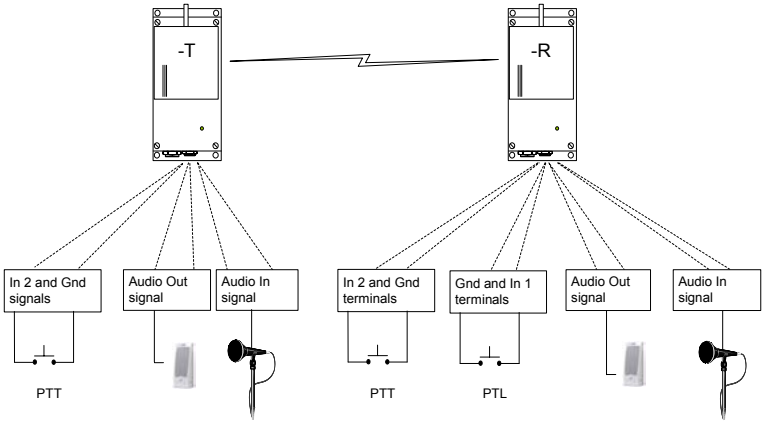
In full duplex, audio is played continuously; the I/Os are available for alarms.

The PTT/PTL transmission mode uses the I/O pins; therefore, you cannot program alarms and PTT/PTL at the same time. PTT/PTL requires a specific hardware configuration:

- To activate the audio reception circuit (for PTL) on receiver units, you have to short the alarm input 1 dry contact and the alarm ground signal. You cannot activate PTL on transmitters. Remember to change the input 1 setting for audio use in the Configuration Assistant.
- To activate the audio transmission channel (for PTT), you must trigger an activation switch (for example, a button) that is based on the shorting of the alarm input 2 and alarm ground signals.

If both the transmitter's and receiver's PTT switches are activated at the same time, the receiver will have precedence: Audio will be transferred from the receiver to the transmitter. If the receiver's PTL and PTT functions are activated at the same time, PTT will be activated and PTL will be ignored.

Here is a typical PTT/PTL application:



Regardless of the audio mode (PTT/PTL or full duplex), you need to connect the audio equipment on both units:

- You plug the audio input signal of the unit to the Line-out connector on a pre-amplifier. Then you plug a microphone on the pre-amplifier.
- You plug the audio output signal of the unit to the Line-in connector on an amplifier. Then you plug a speaker on the amplifier.

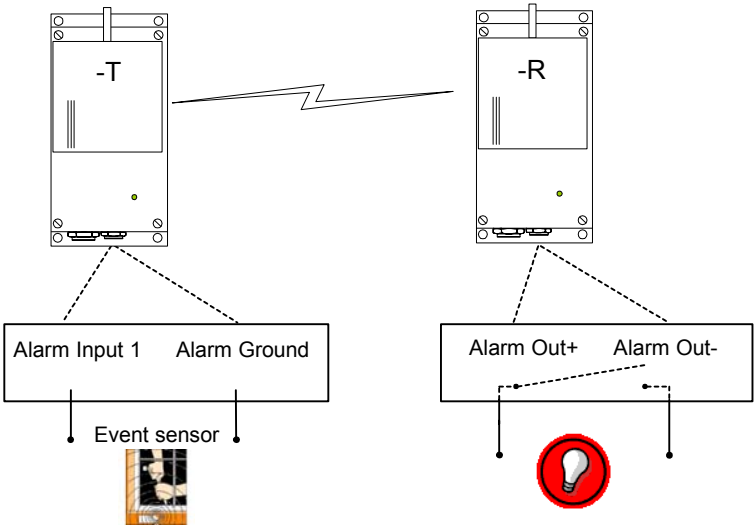
The audio input/output specifications are:

Mode	Gain	Impedance	Frequency range
Input	0 dBm	600 ohms	300–3600 Hz
Output	-8 dBm	600 ohms	

Alarms

The receiver and transmitter units can generate alarms (or events). Typically, an alarm will be generated on a transmitter and acknowledged on a receiver.

To generate an alarm on a transmitter, you short the input 1 dry contact and the alarm ground. The relay output on the receiver is configured to close the contact between the two output pins (up to 48V at 100 mA) upon alarm activation.



Performing a Hardware Reset

You can perform a hardware reset on the unit. This operation will assign the factory default settings to the configuration parameters of the unit (listed in Appendix A on page 65). All user-defined values will be lost.

Following a reset, you may need to reprogram the S1100 unit for proper operation with the other unit.

To perform a hardware reset:

1. Power down the unit.
2. Short the TxD and CTS wires together.

   If required, check the DB-9 pinout on page 69.
3. Power up the unit and wait until the normal boot-up sequence is completed.
4. Remove the short on the TxD and CTS pins.

The unit is ready for use with the factory default settings.

Status LED

The status LED is a bicolor (green-red) LED that provides detailed information on the current state of the unit.

Condition	Indication	-T	-R
Green blink every sec.	The unit is looking for a frequency channel.		✓
Steady red	The unit is powering up.	✓	✓
Flashing green (3 sec. intervals)	The firmware has started, but RF communication is not established.	✓	✓
Flashing green (1 sec. intervals)	The firmware has started, RF communication is established, but no video is transmitted.	✓	
	The firmware has started, RF communication is established, but no video is received.		✓

Condition	Indication	-T	-R
Flashing green (0.2 sec. intervals)	The firmware has started, RF communication is established, and video is transmitted.	✓	
	The firmware has started, RF communication is established, and video is received.		✓
Three consecutive red blinks every 2 sec.	No video source is detected and no video is transmitted.	✓	
Flashing green-red (1 sec. intervals)	The unit is undergoing a firmware update.	✓	✓
One red blink	A video packet is lost. In the worst case, it could flash at 5 Hz.		✓

The following power-up conditions are abnormal:

- LED not lit—Check the power supply and cabling. If power is available and the LED stays off, call Verint Video Solutions technical support for assistance.
- Steady red LED—There is an internal error that prevents the unit from starting normally. Power down, then power back up the unit once. If the condition persists, proceed to a firmware update (for details, see page 61). If the update fails or the condition persists after the update, call Verint Video Solutions technical support.
- Flashing red LED (2 second intervals)—There is an internal error that prevents the unit from operating normally. This situation may happen after a firmware update or after the first boot-up. Power down the unit and call Verint Video Solutions technical support.
- Flashing green-red LED not during a firmware update—The unit requires a new firmware.

4

Using the Configuration Assistant

The S1100 units come with a proprietary setup tool called the *Configuration Assistant*. This tool also allows you to see the status of your units.

Getting Started

You find the Configuration Assistant executable file (`ConfigurationAssistant.exe`) on the *SmartSight Utilities* CD shipped with your units and in the firmware file downloaded from our web site (Firmware Upgrades section).

With this software tool, you configure the transmitter and receiver S1100 units in a single operation. In a repeater context, you will need SConfigurator, another SmartSight tool, to configure the S3100 bridges.

To install the Configuration Assistant:

- Copy the executable file of the Configuration Assistant to the hard disk of your computer.

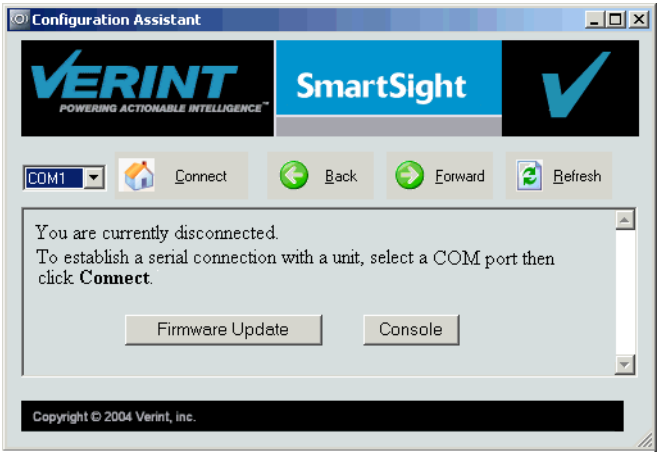
To get started with the Configuration Assistant:

1. Ensure that the receiver unit is connected to a COM port of your computer using the DB-9 end of the supplied CAB9P serial cable.

   Warning: You need to disable any program using this COM port prior to starting this procedure.

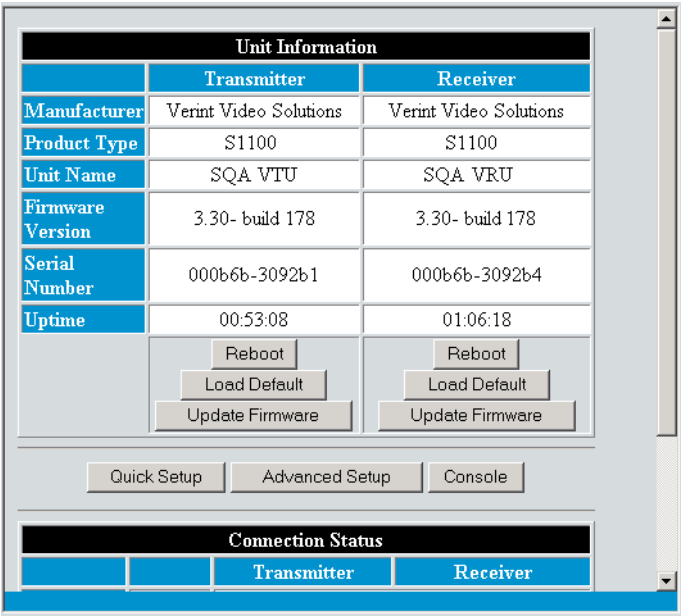
2. Ensure that both S1100 units are running.
3. In the Windows file manager, start the `ConfigurationAssistant.exe` program.

   The Configuration Assistant window appears.



4. Ensure that the proper COM port name is displayed at the left end of the toolbar.
5. To establish the connection with the unit, click **Connect**.

   The main Configuration Assistant window appears, holding the Unit Information and Connection Status panes.



6. To display a help string in the bottom section of the window, providing more information on a parameter or button, move the mouse over it.
7. To browse back in the sequence of accessed data panes, if applicable, click **Back**.
8. To browse forward in the sequence of accessed data panes, if applicable, click **Forward**.
9. To update the display of information, click **Refresh**.
10. To disconnect the Configuration Assistant from the unit, click **Disconnect**.

Performing a Basic Configuration

You can easily set up your radio system by providing a minimal set of parameters.

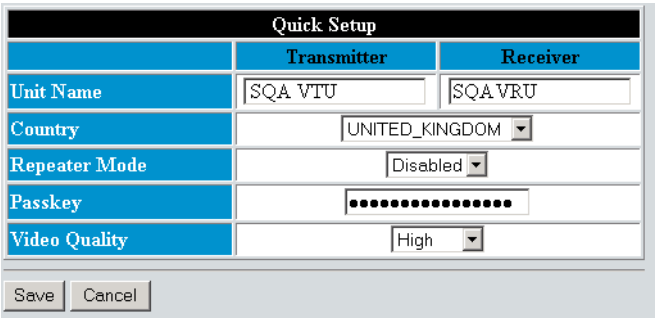
The **Video Quality** parameter represents a predefined set of video settings. Here are the three available sets:

Parameter	High	Medium	Low
Resolution	All lines	CIF	CIF
Frame rate	25	25	12
Bit rate (kbps)	3000	1400	900
Min. quantizer	3	2	2
Max. quantizer	15	15	15
Input filter	Low	Low	Medium
Deblocking filter	On	On	On

To perform a basic configuration:

1. At the bottom of the Unit Information pane, click **Quick Setup**.

   The Quick Setup pane appears.



2. Select the country of operation of the pair of units.

   You must assign the proper country to comply to the DFS/TPC regulations, if applicable, and to use the proper set of frequency channels.

3. If your units are part of a repeater system, enable the repeater mode.

4. Change the wireless passkey of the units:
   - If the units form a point-to-point system, enter the passkey common to the transmitter and receiver.
   - If the units are in repeater mode, enter two different passkeys.
5. Assign a meaningful name to the units.
6. Perform other changes, if required.
7. Click **Save**.

   If there is a functional RF communication between the units, the Configuration Assistant sends the relevant parameters to the transmitter. Otherwise, a message appears, asking you to connect the transmitter to the COM port of the computer.

   The units reboot.

Performing an Advanced Configuration

In addition to the quick setup pane, you have access to a more elaborate set of parameters. You can use them to fine tune the configuration of your units, for instance if you are colocating many systems or troubleshooting your units with a technical support specialist.

You have access to the following configuration parameters:

- General
- Wireless
- Video
- Audio
- Serial port

To perform an advanced configuration:

1. At the bottom of the Unit Information pane, click **Advanced Setup**.
2. Perform the necessary changes.

3. Click **Save**.

   If there is a functional RF communication between the units, the Configuration Assistant sends the relevant parameters to the transmitter. Otherwise, a message appears, asking you to connect the transmitter to the COM port of the computer.

   The units reboot.

General

The general parameter is:

General		
	Transmitter	Receiver
Unit Name	SQA VTU	SQA VRU

Wireless

The available wireless parameters are:

Wireless		
	Transmitter	Receiver
Country	UNITED_KINGDOM	
Repeater Mode	Disabled	
Passkey	••••••••••••••••	
Pair Number	1	
RF Band	802.11g (2.4GHz OFDM)	
Channel	Auto	
Bit Rate	Auto	
Starting Order	1	
Antenna Gain	13	13
Transmit Power Scale	Maximum	Maximum
Sensitivity Threshold	Normal	Normal

Here is additional information on some of these parameters:

- Repeater Mode—If you set the mode to **Enabled**, you will have to use the SConfigurator tool, instead of the Configuration Assistant, to subsequently change any wireless parameter; otherwise, the repeater will not work properly. For more information, page 50.

- Pair Number—You need to assign a unique pair number to the units being configured when more than one pair are used with the same S3100 repeater.
- Channel—If your units are operating in a DFS environment, you cannot manually select the frequency channel; in this context, the displayed value is **Auto**. In a non-DFS environment, you can either manually select a channel or choose the automatic channel selection.
- Bit Rate—The **Auto** value represents the best possible value (with an RF margin of 15 dB) automatically assigned when the connection was established with the other unit. It is the default value.

  Once the unit is operating properly, Verint Video Solutions strongly recommends to change the configured bit rate from Auto to the actual bit rate of the connection. This way, the wireless communication will be more stable in the presence of changing atmospheric conditions or other RF interferers. To know the actual bit rate of the connection, look in the Wireless Status window (see page 48). If the quality of the RF link degrades severely, the actual bit rate could be lower that the manually configured one.
- Starting Order—At the beginning of the boot sequence in a DFS context, the receiver unit waits a specific number of seconds based on the value of this parameter. This wait period will ensure that no two receivers will start at the same time and select the same frequency channel. The starting order delay is: (*order* - 1) multiplied by 80 seconds.

  The default starting order is 1; every colocated system should have a different value for this parameter.

  This parameter takes effect only when the RF channel is set to Auto.
- Antenna Gain—If you use an external antenna with your unit, it is important to enter its gain in the Configuration Assistant. This way, the unit will be able to automatically change its transmission power so that the total power (unit and antenna) does not exceed the maximum value established by your country’s regulations.

- Transmit Power Scale—The available values for the emitting power are:
  - Maximum
  - 50%—The power is reduced by 3 dB.
  - 25%—The power is reduced by 6 dB.
  - 12.5%—The power is reduced by 9 dB.
  - Minimum—The power is set at 3 dBm.
- Sensitivity Threshold—Reducing the sensitivity of the radio enables unwanted "noise" to be filtered out. A safe value is 10 dB below the current received signal level (displayed in the wireless connection status; see page 48). The default value, **Normal**, represents the most sensitive context. You must be careful not to reduce the sensitivity to a level where the unit would not "hear" its legitimate correspondent.

Video

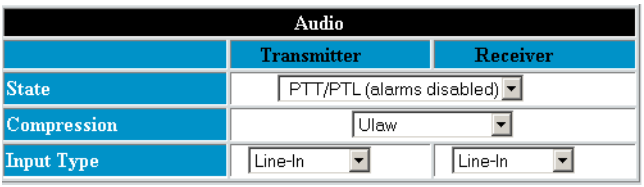
The video parameters are:

Video		
	Transmitter	Receiver
Standard	PAL	
Quality	High	
Resolution	All Lines	
Frame Rate	25	
Bit Rate (kbps)	3000	
Min. Quantizer	3	
Max. Quantizer	15	
Input Filter	Low	
Deblocking Filter	Enabled	

If the content of the **Quality** field is **Low**, **Medium**, or **High**, the next parameters are unavailable. To change these parameters manually, you have to select the **Custom** quality.

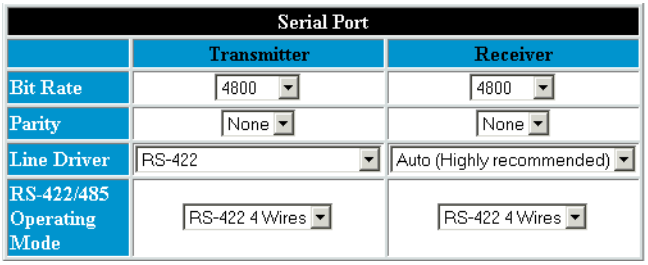
Audio

The audio parameters are:



Serial Port

The serial port parameters allowing communication with the target equipment (camera, monitor, and so on) are:



If the line driver is forced to the RS-422 setting, you may lose access to the Configuration Assistant since most connections with computers are performed with the RS-232 protocol. To gain access to the Configuration Assistant in this context, you would have to use an RS-422 to RS-232 converter, use an RS-422 port on your computer, or perform a hardware reset (described on page 37).

Checking the Connection Statuses

The main Configuration Assistant window presents the general connection statuses of the pair of units.

Connection Status			
		Transmitter	Receiver
Wireless	More...	-29 dBm, Excellent	
Video	More...	PAL, Video input detected	
Audio	More...	Disabled	
Serial Port	More...	4800,8,N,1	4800,8,N,1

You can get more details by clicking the corresponding **More** button.

Wireless

The specifics of the wireless status are:

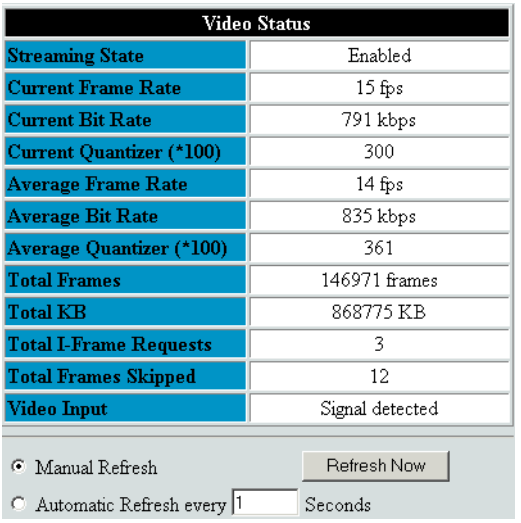
Wireless Status		
	Transmitter	Receiver
Connection Status	Connected	
Communication Quality	Excellent	Excellent
Current Channel	60	60
Signal Level	-44 dBm	-45 dBm
Tx Bit Rate	36 Mbps	36 Mbps
Rx Bit Rate	36 Mbps	36 Mbps
RF Margin	Excellent (32 dB)	Excellent (32 dB)
Sensitivity Threshold	-80 dBm	-80 dBm

Manual Refresh Refresh Now

Automatic Refresh every 1 Seconds

Video

The specifics of the video status are:



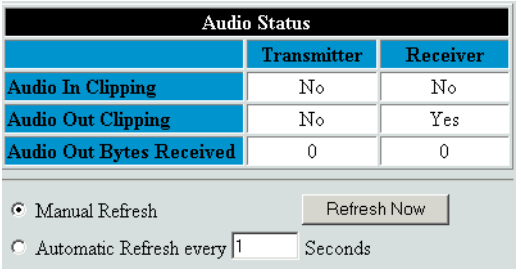
Video Status	
Streaming State	Enabled
Current Frame Rate	15 fps
Current Bit Rate	791 kbps
Current Quantizer (*100)	300
Average Frame Rate	14 fps
Average Bit Rate	835 kbps
Average Quantizer (*100)	361
Total Frames	146971 frames
Total KB	868775 KB
Total I-Frame Requests	3
Total Frames Skipped	12
Video Input	Signal detected

Manual Refresh Refresh Now

Automatic Refresh every 1 Seconds

Audio

The specifics of the audio status are:



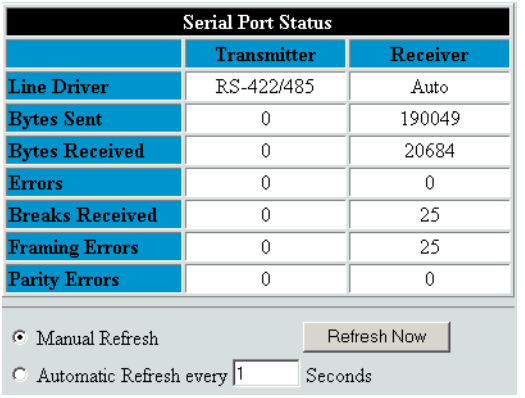
Audio Status		
	Transmitter	Receiver
Audio In Clipping	No	No
Audio Out Clipping	No	Yes
Audio Out Bytes Received	0	0

Manual Refresh Refresh Now

Automatic Refresh every 1 Seconds

Serial Port

The specifics of the serial port status are:



Serial Port Status		
	Transmitter	Receiver
Line Driver	RS-422/485	Auto
Bytes Sent	0	190049
Bytes Received	0	20684
Errors	0	0
Breaks Received	0	25
Framing Errors	0	25
Parity Errors	0	0

Repeater Consideration

If your S1100 units are part of a running point-to-point repeater, you must use the SConfigurator tool, instead of the Configuration Assistant, to change the wireless parameters; otherwise, the repeater will not work properly. For more information about SConfigurator, refer to its user manual.

To access the S1100 units with SConfigurator, you need to temporarily change the IP address of your computer. The temporary address must be in the 192.168.135.255 subnet. The procedure varies depending on your operating system (Windows 2000 or Windows XP).

The recommended temporary IP settings are:

- IP address: 192.168.135.2
- Subnet mask: 255.255.255.0
- Default gateway: 192.168.135.1

To change the IP address under Windows 2000:

1. From the desktop, right-click **My Network Places**, then choose **Properties**.

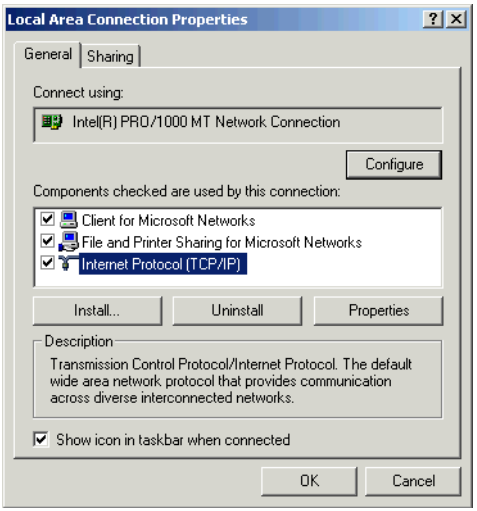
   The Network and Dial-up Connections window appears.

2. Double-click **Local Area Connection**.

   The Local Area Connection Status window appears.

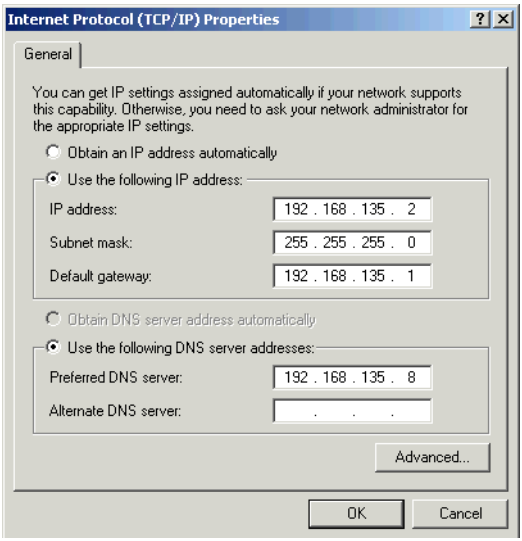
3. Click **Properties**.

   The Local Area Connection Properties window appears.



4. In the component list, select **Internet Protocol (TCP/IP)**, then click **Properties**.

   The Internet Protocol (TCP/IP) Properties window appears.



5. If **Use the following IP address** is selected, write down the information displayed in the box: the IP address, the subnet mask, and the default gateway.

   You will need these addresses to put back your computer in its initial state once the configuration process is completed.

6. If **Obtain an IP address automatically** is selected, click **Use the following IP address**.

7. Enter the desired IP settings (temporary or initial).

8. Click **OK** to close all windows.

To change the IP address under Windows XP:

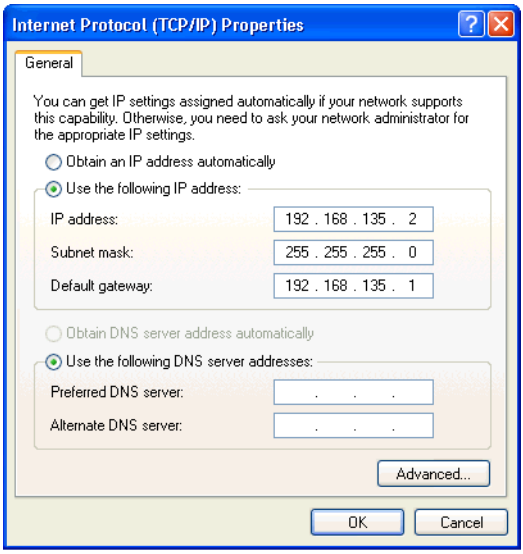
1. In the Windows Start menu, choose **Control Panel**.

2. If the classic view is enabled, choose **Network Selection**. In the category view, select **Network and Internet Connections**, then **Network Connections**.

3. Double-click your active LAN or Internet connection.

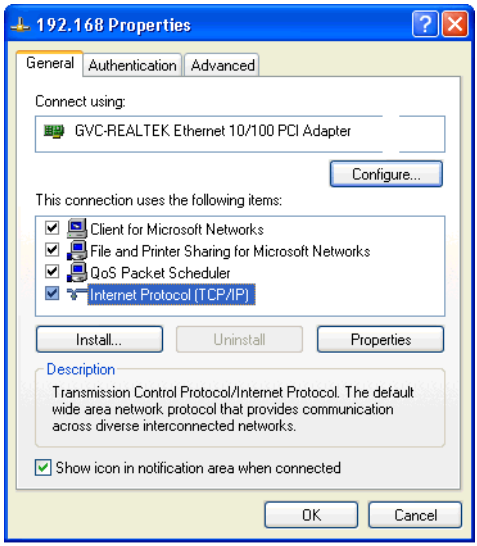
4. Click **Properties**.

A Properties window appears.



5. In the General tab, select the **Internet Protocol (TCP/IP)** item, then click **Properties**.

The Internet Protocol (TCP/IP) Properties window appears.



6. If **Use the following IP address** is selected, write down the information displayed in the box: the IP address, the subnet mask, and the default gateway.

   You will need these addresses to put back your computer in its initial state once the configuration process is completed.

7. If **Obtain an IP address automatically** is selected, click **Use the following IP address**.
8. Enter the desired IP settings (temporary or initial).
9. Click **OK** to close all windows.

Accessing the CLI of the Unit

You may need to access the command line interface (CLI) of a unit to perform troubleshooting tasks. The CLI is hierarchically organized, with menus, sub-menus, and individual options representing configuration parameters.

To access the CLI, you need a serial connection between the computer and the unit.

To access the CLI of a unit:

1. Connect the desired unit to the computer using the CAB9P serial cable.
2. Start the Configuration Assistant.

3. Under the Unit Information pane, in the main Configuration Assistant window, click **Console**.

   The CLI of the unit appears in the Console window.

```
*******************************
Main Menu
-------------------------------
Menus:
1) Serial Port
2) Access Management
3) Network
4) Wireless Communication
5) System Status
6) Advanced

Commands:
s) Save Settings
r) Reboot System
1) Load Default Configuration
q) Quit
*******************************
```

   The CLI has a timeout that is triggered after three minutes of inactivity. When the timeout occurs:

   - You lose access to the command line.
   - The "Thank you for using the Verint Video Solutions CLI" message appears at the command line.
   - The Console window becomes disabled.
   - The Disconnect button switches to Connect.

4. To reactivate the CLI after a timeout, click **Connect**.
5. To work through the CLI menu structure, follow these guidelines:
   - To execute a command or open a menu, type in the corresponding letter or number, then press **Enter**.
   - To return to the previous menu, enter **p**.
6. To end the CLI work session:
   a. Save the settings by entering **s** at the main menu, then pressing **Enter**.
   b. Exit the CLI by entering **q** at the main menu, then pressing **Enter**.

      Depending on the changed settings, the unit may perform a soft boot.

5

Understanding the On-Screen Display

The S1100 receiver units display information on a video monitor.

The on-screen display (OSD) information presented on the video monitor can be broken down into four quadrants as follows::

Quadrant 1	**Quadrant 2**
Quadrant 4	**Quadrant 3**

Quadrant 1 is unused.

If a video source is not plugged into the transmitter that is connected to the receiver and if that transmitter is currently streaming, quadrants 1 and 4 turn to red and quadrants 2 and 3 become blue/black.

Quadrant 2: SmartSight Logo

In quadrant 2, when the unit is powering up, the SmartSight logo will be displayed for 30 seconds.

Quadrant 3: Receiver Settings

Quadrant 3 displays basic configuration details of the receiver, including firmware version, serial port, and RF data. This information is displayed for 30 seconds every time the connection is established with the transmitter. For example:

```
VRU Local Unit
S1100
Ver: 3.30- build 178
Comm: 4800, 8, N, 1 422f-d
RF Status: Connected
RF Channel: Auto
RF Bit Rate: 6 Mbps
Pair Number: N/A
Country: UNITED_KINGDOM
```

Here is the description of the `Comm` line:

Serial port	Description
4800	Bit rate
8	Number of data bits
N	Parity: None
1	Number of stop bits
422f-d	Line driver

Quadrant 4: Transmitter Settings

Quadrant 4 displays basic S1100-T configuration details, including firmware version, serial port, and RF data. This information is displayed for 30 seconds every time the connection is established with the receiver. For example:

```
VTU Remote Unit
S1100
Ver: 3.30- build 178
Comm: 4800, 8, N, 1 422f-d
RF Channel: Auto
RF Bit Rate: 6 Mbps
Country: UNITED_KINGDOM
```

6

Updating the Firmware

You use the SmartSight Configuration Assistant to update the firmware of your S1100 unit. You can download the latest firmware file from our web site (Firmware Upgrades section).

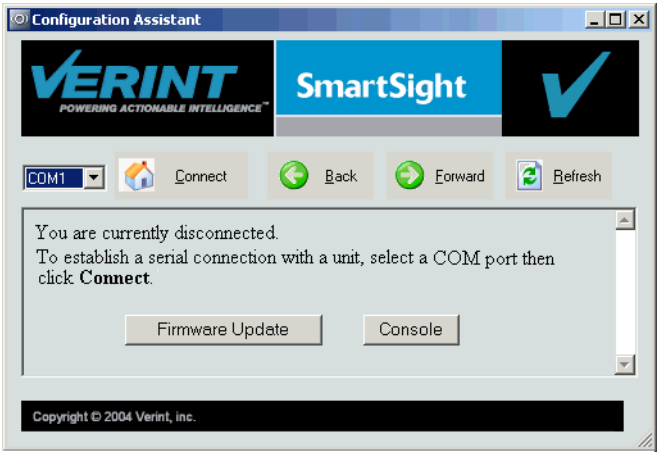
You can update the firmware of both units making up the S1100 system in a single operation, provided the RF link is stable. You should connect the receiver (the *local* unit) to the computer, then start by updating the firmware of the transmitter (the *remote* unit).

The firmware files have the `.xh` or `.zxh` extension.

To update the firmware:

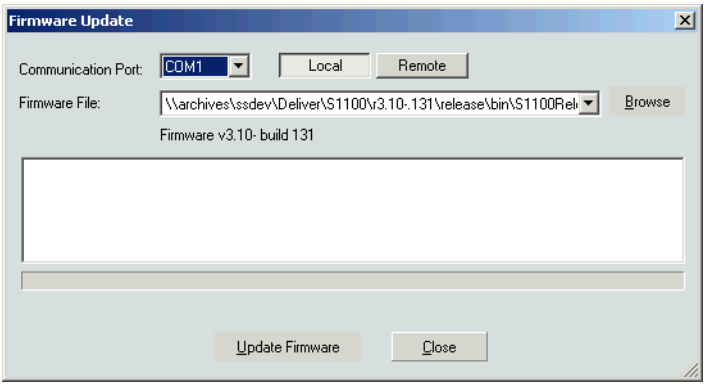
1. Ensure that the receiver unit is connected to a COM port of your computer using the DB-9 end of the CAB9P serial cable.
2. In the Windows file manager, start the `ConfigurationAssistant.exe` program.

   The Configuration Assistant window appears.



3. Click **Firmware Update**.

   The Firmware Update window appears.



4. In the Communication Port field, select the COM port used.
5. Click **Remote**.
6. Click **Browse**, then select the desired firmware file.
7. Click **Update Firmware**.

   The update process of the remote unit starts. It may take several minutes to complete.

   If a communication problem occurs during the remote update, you may get the following message: "Firmware update failed. ** Do not reboot the unit! ** Restart the remote firmware update as soon as possible." You have to restart the procedure immediately. If you reboot the unit before proceeding with the update procedure, it will stop responding and you will have to upgrade its firmware using the serial port.

8. When the remote procedure is completed, click **Local**, then **Update Firmware**.

   The update process of the local unit starts. It may take several minutes to complete.

The most frequently displayed messages include:

Serial communication is ready. The Configuration Assistant has opened the communication port. The connection is ready to be used.

Serial communication is not ready. The Configuration Assistant cannot open the communication port. Check to see if you are using the correct COM port or if it is being used by another application.

Starting firmware upload. The update process has begun.

Firmware upgrade request sent. The Configuration Assistant has made a request to the S1100 unit for update.

Reception timed-out. Verify that serial cable is properly connected. Check the quality of the cable assembly. If the problem persists, contact Verint Video Solutions technical support.

Communication established. The Configuration Assistant is now communicating with the unit.

Reception timed-out. Retry attempt. The established connection has been broken. A disconnected cable may be the cause.

Communication aborted. Max retries reached. The "Reception timed-out. Retry attempt" problem is unresolved after the 10th attempt, so communication is aborted. Check that the cable is not damaged and is properly installed. If the problem persists, contact Verint Video Solutions technical support.

Firmware upload in progress. The update process is in progress.

Firmware upload done. The update process has been completed successfully.

Invalid firmware file. Select a valid file. If the problem persists, contact Verint Video Solutions technical support to obtain a valid file.

A

Factory Default Configuration

The S1100 is programmed at the factory with the following configuration:

Type	Configuration
Serial port	■ Bit rate: 4800 bauds ■ Parity: none ■ Line driver: auto-detected ■ RS-422/485 operating mode: RS-422 4 Wires
Video settings (North America)	■ Standard: NTSC ■ Quality: high ■ Resolution: All lines (352 x 480) ■ Target frame rate: 30 fps ■ Target bit rate: 3000 kbps ■ Minimum quantizer: 3 ■ Maximum quantizer: 15 ■ Input filter: low ■ Deblocking filter: on
Video settings (Europe)	■ Standard: PAL ■ Quality: high ■ Resolution: All lines (352 x 576) ■ Target frame rate: 25 fps ■ Target bit rate: 3000 kbps ■ Minimum quantizer: 3 ■ Maximum quantizer: 15 ■ Input filter: low ■ Deblocking filter: on
Wireless Communication (North America)	■ Wireless passkey: ABCDEFGHIJKLMNOP ■ Frequency band: 802.11a (5 GHz OFDM) ■ Channel: Auto ■ Tx bit rate: Auto ■ Antenna gain: 13 dBi ■ Country: USA ■ Tx power scale: Maximum
Wireless Communication (Europe)	■ Wireless passkey: ABCDEFGHIJKLMNOP ■ Frequency band: 802.11a (5 GHz OFDM) ■ Channel: Auto ■ Tx bit rate: Auto ■ Antenna gain: 13 dBi ■ Country: United Kingdom ■ Tx power scale: 50% (-3 dB)

B

Cable Descriptions

The wireless units use the following two cables:

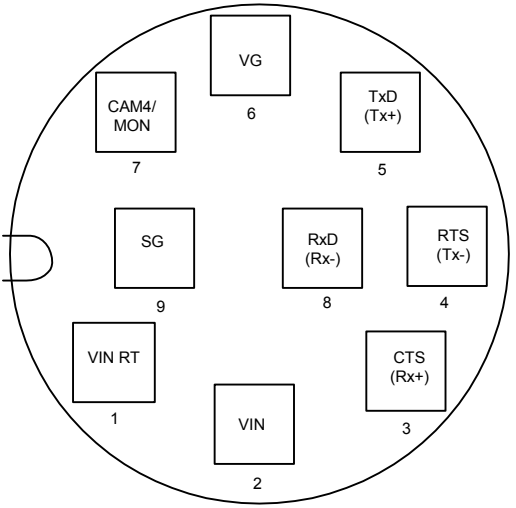
- CAB9P—Power, video, and serial data communication
- CAB8P—Audio and alarms

Note: To determine the Rx and Tx pins of your equipment, see Appendix C on page 71.

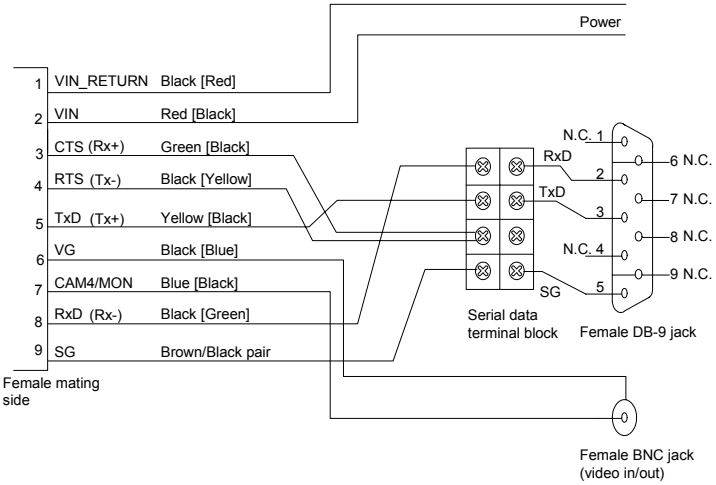
CAB9P

The CAB9P cable supplied with the wireless units is used for power, video, and serial communication (that is, PTZ data with the RS-422/485 protocol, or RS-232 communication with the DB-9 connector).

The mating side view of the cable is, using the RS-232 signal terminology:



Here is the pinout of the CAB9P cable:



where:

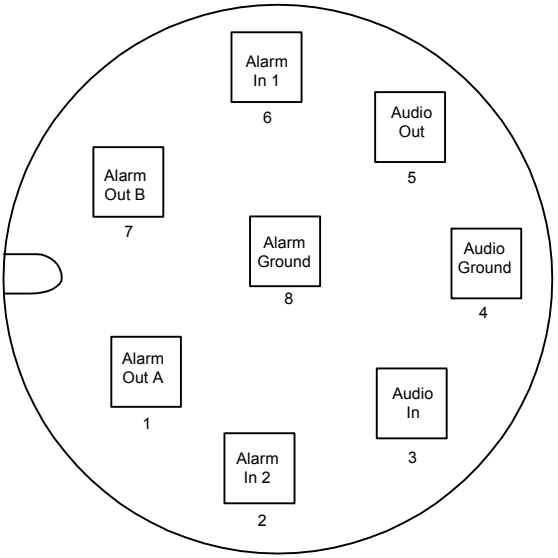
- The RS-422/485 signal terminology is enclosed in parentheses.
- The other wire of the twisted pair is enclosed in square brackets.
- N.C. means *not connected*.

Based on the pinout, the wiring scheme for a connection to a computer is:

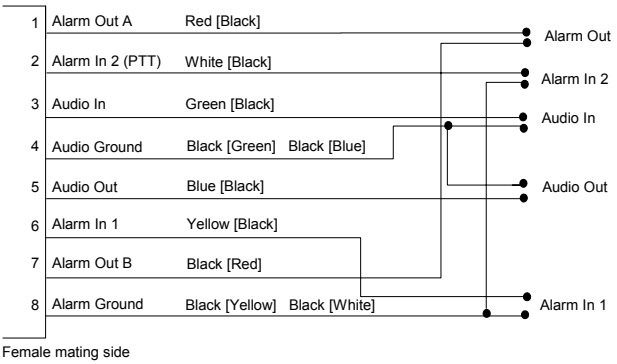
Cable			**Computer**
Signal name	**Wire pair**	**Wire color**	**Signal name**
CTS	green/black	green	not connected
RxD		black	RxD
TxD	yellow/black	yellow	TxD
RTS		black	not connected
SG	brown/black	brown	SG
SG		black	SG

CAB8P

The CAB8P cable is used for audio and alarms. The mating side view of the cable is:



Here is its pinout:



where:

- The other wire of the twisted pair is enclosed in square brackets.

C

DTE and DCE Connections

Before connecting a SmartSight unit to other serial equipment, you need to determine if they are DTE (data terminal equipment) or DCE (data communication equipment).

Here are examples of both equipment types:

- DCE—SmartSight units, modems
- DTE—Computers, switches, multiplexers, cameras, keyboards

You need to know the equipment type of the other serial device to connect it correctly to the S1100 unit, which is a DCE.

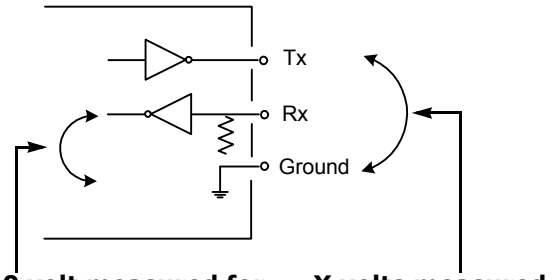
In the following descriptions:

- Voltage is measured when no data is transferred on the Rx and Tx pins.
- *-X volts* represents a negative voltage value.

Data Terminal Equipment

DTE modules have the following electrical-level setup:

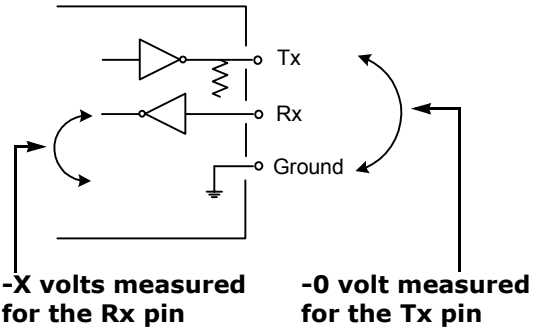
Pin number	Signal	Measured voltage
3	Tx	-X volts
2	Rx	0 volt



Data Communication Equipment

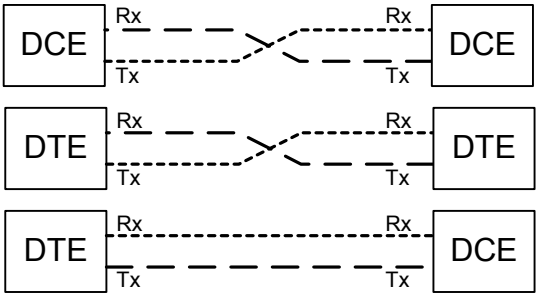
DCE modules have the following electrical-level setup:

Pin number	Signal	Measured voltage
3	Tx	0 volt
2	Rx	-X volts



Connecting DTE and DCE

When connecting two modules of the same type, you have to cross the data wires to create proper communication. On the other hand, when connecting a DTE with a DCE, a straight cable is required.



D

Surge Protection

Voltage and current surges can be induced by lightning strikes or power line transients. In the real world, under the right circumstances, these surges can reach sufficiently high levels to damage almost any electronic equipment. Therefore you need to add protection to your units.

The S1100 provides basic surge protection on all electrical lines for both the transmitter and receiver units. If you are installing the equipment in a lightning prone or heavy lightning environment, or in a site where large AC mains power fluctuations are a common occurrence, Verint Video Solutions strongly recommends that you add additional external surge protection to all vulnerable connections. Vulnerable connections are those that run more than several feet (meters) between the S1100 unit and the connected equipment.

The video camera (or dome) is usually within a short distance of the S1100 transmitter; the S1100 interface cable can be routed directly into the camera/dome housing. Therefore, the video line (and the serial port if using a dome) will seldom need additional protection. The power feed usually runs down the mounting mast or wall for more than 20 feet (7.6 meters); it is a good candidate for additional protection in a surge prone environment. This protection will benefit both the camera and the unit.

The monitoring and control station is usually far away from the S1100 receiver. In a surge prone environment, the video output and serial port connections of the unit are the most vulnerable to large AC mains variations. Whether you add external protection or not, always ensure that you ground reference the serial port connection of the unit by plugging its brown/black wires to the serial port ground of the target equipment in the control room. Failure to do so severely reduces the performance of the internal protection circuits of the unit.

Excellent international sources for external surge protection equipment and general surge and lightning protection information are:

- Polyphaser Corporation—www.polyphaser.com
- Citel inc.—www.citelprotection.com
- Transtector—www.transtector.com

For the curious mind, a surge protector helps to clamp the surge to safe levels and divert its energy to the earthing point, preventing device damage. Experienced installers know that an effective surge protection must be installed with proper earthing and grounding.

E

RF Contact between Masters

If the country of operation of your units requires DFS compliance, you must ensure that the master units (S3100 and S1100-R) in colocated cells “see” one another in their permanent location. Such a contact means that RF communication can be performed between each pair of masters, therefore preventing them to choose the same frequency channel.

Apply the following procedure to ensure that *MasterA* sees *MasterB*. You will have to access the command line interface (CLI) of at least one master. For more information about the CLI, refer to Chapter 4 in the *S3100 User Manual* or to Chapter 4 in the *S1100 User Manual*.

To ensure that two master units see each other:

1. Take down the unit name of MasterB.

   The unit name is displayed in SConfigurator's Units tab, in the Unit Information pane of the Configuration Assistant, or in the **Advanced > VSIP** menu of the CLI.

2. Shut down MasterB, then power it up.

3. Wait until MasterB has selected a frequency channel. To ensure that a channel is selected:

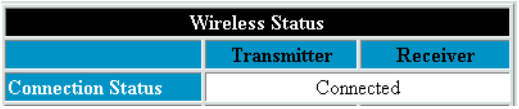
   - If MasterB is an S3100, go in the **Advanced > Communication Status and Statistics > Wireless Status** menu of the CLI. Wait until the value of Current SCF Connection Status is **Connected to *X* Clients and *Y* Slaves**.

```
************************************************************
Advanced \ Communication Status and Statistics \ Wireless Status
------------------------------------------------------------
Parameters:
  NIC Name                      : AT5001 WIS CM6 A,B,G 2.4-5.8 GHz
  NIC MAC Address               : 00-0B-6B-30-FA-42
  Current Channel               : 56 (5280 MHz)
  Current TX Rate               : 36 Mb/s
  Current RX Rate               : 36 Mb/s
  Average Signal Level          : -53 dBm
  Current SCF Connection Status: Connected to 1 Client and 0 Slave

  RF Communication Quality      : N/A
  RF Margin                     : N/A
  Current EIRP                  : 17 dBm
  Maximum EIRP allowed          : 30 dBm
  Indoor/Outdoor RF Regulation : Indoor/Outdoor FCCA FCC1

Commands:
l) Display link(s) Info
v) Visualize Last Site Survey Report
w) Initiate One-Time Site Survey
p) Previous Menu
************************************************************
```

- If MasterB is an S1100, go in the **Wireless Status** window of the Configuration Assistant. Wait until the connection status is **Not Connected** or **Connected**; these statuses occur after **Radar Detection**.



- If you do not have access to the connection status of MasterB, wait for the following time period: (starting order of MasterB - 1) multiplied by 80 seconds.

4. Perform a site survey in MasterA:

a. Open the CLI of the unit.

a. Go in the **Advanced > Communication Status and Statistics > Wireless Status** menu.

b. Execute the **Initiate One-Time Site Survey** command.

c. To see the progress of the operation, press **Enter** every second.

The site survey is completed when the value of Current SCF Connection Status returns to **Connected to *X* Clients and *Y* Slaves**, after having gone to **Site survey (100% completed)**.

d. Execute the **Visualize Last Site Survey Report** command.

e. Check that the MasterB name is listed as the Unit Name of one of the channels. You may have to scroll up the CLI window to see the beginning of the survey data.

For example, in the following site survey, MasterB has a visual connection with the MasterA unit. If the MasterB name is not displayed in the site survey, it means that the two masters cannot see each other.

```
Last Site Survey Report, 4372 seconds old

Channel(1) Cost: 41
 Age  Interf.   Source MAC        Master MAC/        Rx   Unit Name/
 (s)   Type                      802.11 BSSID      (dBm) 802.11 SSID
----- --------- ----------------- ----------------- ----- -----------
   11 SPCF MSTR 00-0B-6B-30-2A-46 00-0B-6B-30-2A-46 -54   MasterB
```

F

Separation Between Units Using Adjacent Channels

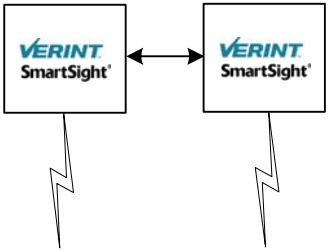
If using adjacent frequency channels in a non-DFS environment, you should respect guidelines relative to the minimum separation between unit antennas. The guidelines apply to the S1100, S1100w, and S3100 units.

In the 2.4 GHz band, the *adjacent channel* term applies only to the three non-overlapping channels (1, 6, and 11).

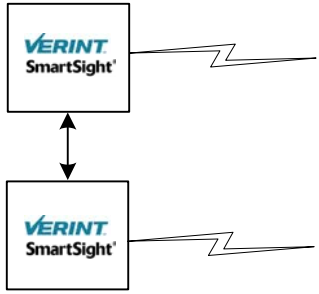
The presented figures represent worse case scenarios. By respecting them, you can assume that there will not be radio interference between the units.

Three physical setups are covered:

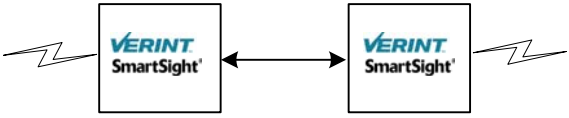
Side by side:



On top:



Back to back:



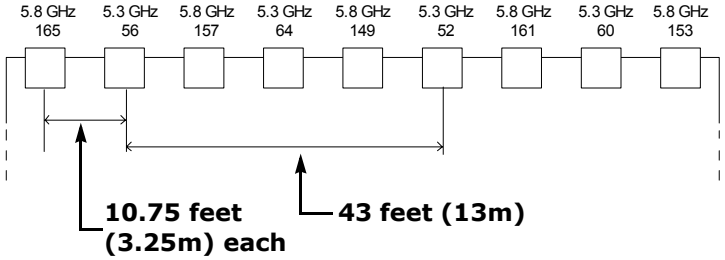
The minimum separation between units using adjacent channels are:

Setup	5 GHz (13-dBi antenna with 40º beam width)	2.4 GHz (8.5-dBi antenna with 60º beam width)
Side by side	43 feet (13m)	55.8 feet (17m)
On top	13 feet (4m)	6.2 feet (1.9m)
Back to back	7.8 feet (2.4m)	15.7 feet (4.8m)

If you are using other antennas with narrower beam widths, the distances may be reduced. For assistance, contact the Verint Video Solutions project engineering group.

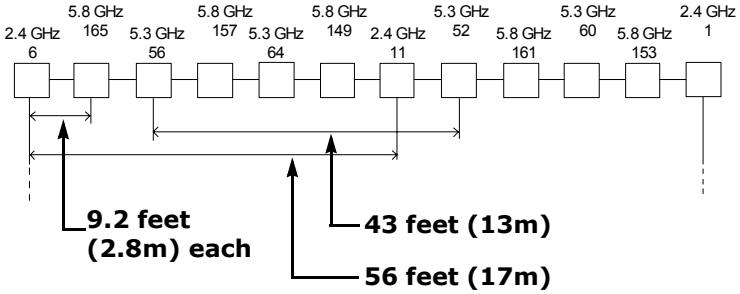
To help you plan your systems, here are installation scenarios that respect the limitations. These scenarios include the frequency band and channel.

- Using only 5 GHz channels, all on the same side of a building:



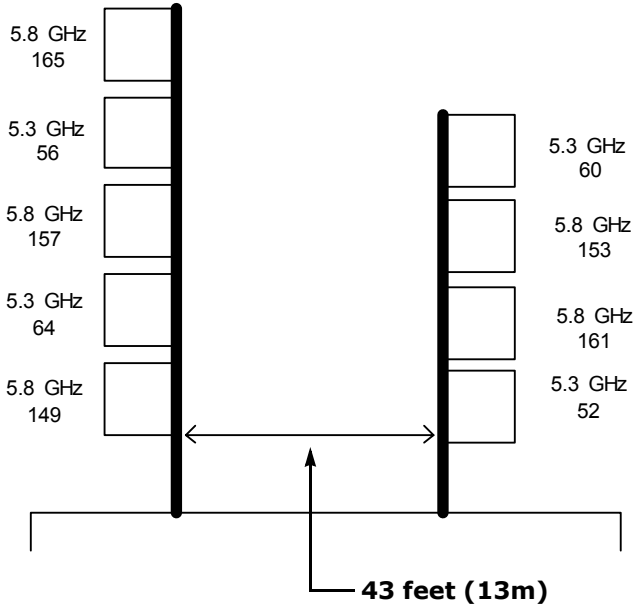
Notice that the units using the adjacent channels 52 and 56 are separated by the prescribed 43 feet (13m). However, you can intersperse other units in-between, as long as they do not use adjacent channels. This way, you can increase the unit density without encountering interference problems.

- Using 5 GHz and 2.4 GHz channels, all on the same side of a building:

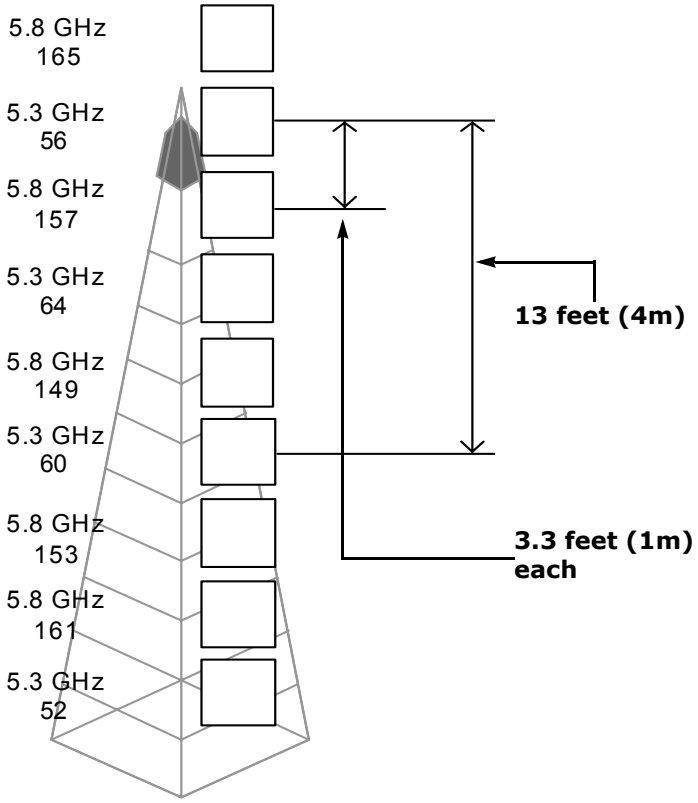


The units using the adjacent channels 6 and 11 in the 2.4 GHz are separated by the prescribed 56 feet (17m).

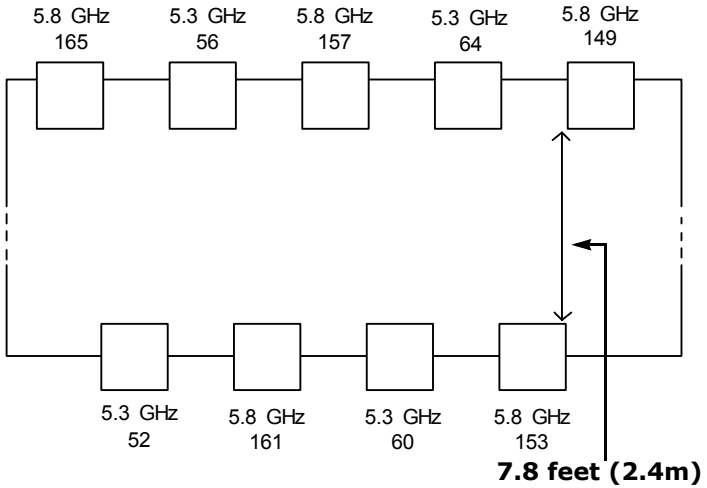
- Using only 5 GHz channels, all pointing in the same direction on two poles. There is no minimum separation between any two adjacent units sharing a pole, since they do not use adjacent channels:



- Using only 5 GHz channels, all on the same side of a tower. The minimum separation between units using adjacent channels—for example, 56 and 60—is the prescribed 13 feet (4m):



- Using only 5 GHz channels, on two sides of a building. There is no separation limitation between any two adjacent units, since they do not use adjacent channels. The minimum separation of 7.8 feet (2.4m) between back-to-back units is respected:



G

Technical Specifications

Here are the S1100 technical specifications:

Network	RF interface	SmartSight SDCF
	Modulation	OFDM
	Encryption	128-bit AES
	Data rate (max. burst rate)	6, 9, 12, 18, 24, 36, 48, and 54 Mbps
	Security	SSL-based authentication
Video	Compression	MPEG-4-based
	Frame rate	NTSC: 1–30 fps programmable (60 fields per second) PAL: 1–25 fps programmable (50 fields per second)
	Input	1 composite, 1 Vpp into 75 ohms (NTSC/PAL)
	Output	1 composite, 1 Vpp into 75 ohms (NTSC/PAL)
Serial Port	Operating mode	Transparent: supports any asynchronous PTZ serial protocol
	Electrical level	Auto-sensing RS-232 or RS-422/485
Alarm and Audio	Alarm input	2 dry contact inputs (1 mA max.)
	Alarm output	1 relay contact output (up to 48V at 100 mA)
	Bidirectional audio	Input: 0 dBm into 600 ohms Output: -8 dBm into 600 ohms
Power	Input voltage	24V AC +/- 10% 12V DC +/- 10% (optional)
	Consumption	28 VA at 24V AC 12W (970 mA at 12V DC)
Physical	Enclosure	NEMA 4X/IP 66 powder coat painted die-cast aluminum with wall mounting brackets
	Size	9.0L x 3.9W x 3.8H inches (230L x 100W x 96H mm)
	Weight	3.6 lb. (1.65 kg)
	Environment	-22ºF to 122ºF (-30ºC to 50ºC)
	Humidity	100% at 122ºF (50°C)
Certification/ Regulation	USA	FCC part 15 (subparts B and E)
	Canada	Industry Canada RSS-210, RSS-139, and ICES-003

Europe	CE marked EN 300 328-2 V1.2.1 (2001-12) EN 301 893 V1.2.3 (2003-08) EN 301 489-01 V1.4.1 (2002-08) EN 301 489-17 V1.2.1 (2002-08) EN 60950:2000

Glossary

This glossary is common to the SmartSight line of products.

Access Point A device acting as a communication switch for connecting wireless units to a wired LAN. Access points are mainly used with wireless transmitter units to transfer wireless content onto the wired IP network.

APIPA (Automatic Private IP Addressing) A feature of Windows-based operating systems that enables a device to automatically assign itself an IP address when there is no dynamic host configuration protocol (DHCP) server available to perform that function. Also known as *AutoIP*.

Bridge A unit linking a wireless network to a wired Ethernet network. The newest SmartSight bridge is the S3100.

CCTV (Closed Circuit Television) A television system in which signals are not publicly distributed; cameras are connected to television monitors in a limited area such as a store, an office building, or on a college campus. CCTV is commonly used in surveillance systems.

CIF (Common Image Format) A video format that easily supports both NTSC and PAL signals. Many CIF flavors are available, including CIF, QCIF, 2CIF, and 4CIF. Each flavor corresponds to a specific number of lines and columns per video frame.

CLI (Command Line Interface) A textual user interface in which the user responds to a prompt by typing a command.

Codec (Coder/Decoder) A device that encodes or decodes a signal.

Configuration Assistant A proprietary graphical program used to configure and update the firmware of the S1100 units.

DCE (Data Communication Equipment) In an RS-232 communication channel, a device that connects to the RS-232 interface. SmartSight units and modems are DCE.

Decoder See *Receiver*.

DHCP (Dynamic Host Configuration Protocol) A communication protocol that lets network administrators manage centrally and automate the assignment of Internet Protocol (IP) addresses in a network.

DTE (Data Terminal Equipment) In an RS-232 communication channel, the device to which the RS-232 interface connects. Computers, switches, multiplexers, cameras, and keyboards are DTE.

DVR (Digital Video Recorder) A device (usually a computer) that acts like a VCR in that it has the ability to record and play back video images. The DVR takes the feed from a camera and records it into a digital format on a storage device which is most commonly the hard drive.

Encoder See *Transmitter*.

Ethernet A local-area network (LAN) architecture using a bus or star topology and supporting data transfer rates of 10 Mbps. It is one of the most widely implemented LAN standards. The 802.11 protocols are often referred to as "wireless Ethernet."

Firmware Software stored in read-only memory (ROM) or programmable ROM (PROM), therefore becoming a permanent part of a computing device.

IP (Internet Protocol) The network layer for the TCP/IP protocol suite widely used on Ethernet networks.

LAN (Local Area Network) A computer network that spans a relatively small area. A LAN can connect workstations, personal computers, and surveillance equipment (like video servers). See also *WAN*.

MPEG-4 A graphics and video lossy compression algorithm standard that is derived from MPEG-1, MPEG-2, and H.263. MPEG-4 extends these earlier algorithms with synthesis of speech and video, fractal compression, computer visualization, and artificial intelligence-based image processing techniques.

Multicast Communication between a single sender and multiple receivers on a network; the devices can be located across multiple subnets, but not through the Internet. Multicast is a set of protocols using UDP/IP for transport.

nDVR The SmartSight video management and storage software. This graphical product is used in conjunction with wired and wireless video servers.

NTSC (National Television Standards Committee) The North American standard (525-line interlaced raster-scanned video) for the generation, transmission, and reception of television signals. In addition to North America, the NTSC standard is used in Central America, a number of South American countries, and some Asian countries, including Japan. Compare with *PAL*.

NTP (Network Time Protocol) A protocol designed to synchronize the clocks of devices over a network.

OSD (On-Screen Display) Status information displayed on the video monitor connected to a receiver unit.

PAL (Phase Alternation by Line) A television signal standard (625 lines, 50 Hz, 220V primary power) used in the United Kingdom, much of western Europe, several South American countries, some Middle East and Asian countries, several African countries, Australia, New Zealand, and other Pacific island countries. Compare with *NTSC*.

PTL (Push-to-Listen) In a two-way system, the communication mode in which the listener must push a button while listening.

PTT (Push-to-Talk) In a two-way system, the communication mode in which the talker must push a button while talking.

PTZ Camera (Pan-Tilt-Zoom) An electronic camera that can be rotated left, right, up, or down as well as zoomed in to get a magnified view of an object or area. A PTZ camera monitors a larger area than a fixed camera.

Receiver A device converting a digital video signal into an analog form. Also called *decoder*.

Repeater A range extender for wireless links. The SmartSight repeater is made up of two S3100 bridges.

RF (Radio Frequency) Any frequency within the electromagnetic spectrum associated with radio wave propagation. When a modulated signal is supplied to an antenna, an electromagnetic field is created that is able to propagate through space. Many wireless technologies are based on RF field propagation.

RS-232 A standard interface approved by the Electronic Industries Alliance (EIA) for connecting serial devices.

RS-422 A standard interface approved by the Electronic Industries Alliance (EIA) for connecting serial devices, designed to replace the older RS-232 standard because it supports higher data rates and greater immunity to electrical interference.

RS-485 An Electronics Industry Alliance (EIA) standard for multipoint communications.

S1000 Series The SmartSight series of secure outdoor wireless video systems (one receiver and one transmitter per system). The series covers the 2.4 GHz band in North America and Europe and the 5 GHz band in North America. Starting with firmware release 3.20, the S1000 series is replaced by the new S1100 units.

S1000w The SmartSight outdoor wireless video transmitter operating on the 2.4 GHz frequency band.

S1100 The newest series of secure outdoor wireless video systems (one receiver and one transmitter per system) covering the 2.4 and 5 GHz bands in North America and Europe.

S1100w The multiband (2.4 and 5 GHz) SmartSight outdoor wireless video transmitter operating in North America and Europe.

S1500e Series The SmartSight series of wired video servers (receivers and transmitters) designed for video monitoring and surveillance over IP networks. The transmitters in the series offer from one to eight video inputs; the series proposes two receivers with one and four video outputs.

S1600e The SmartSight high-resolution wired video server (receiver and transmitter) providing point-to-point analog extension with web access.

S1700e Series The newest SmartSight series of wired video transmitters designed for video monitoring and surveillance over IP networks, offering DVD-quality video and power over Ethernet. The transmitter in the series offers one video input and web access.

S1708e Series The newest SmartSight series of wired video transmitters designed for a variety of video monitoring and surveillance applications in which a high concentration of cameras terminates within the same area. The transmitters in the series offer 8, 12, or 24 video inputs.

S3100 The outdoor, wireless, digital SmartSight video bridging unit. It has many uses, including linking video servers (wireless or wired) to an Ethernet LAN and acting as a range extender.

SConfigurator A proprietary graphical program used to configure and update the firmware of video server and outdoor wireless bridge units.

Serial Port An interface that can be used for serial communication, in which only one bit is transmitted at a time. A serial port is a general-purpose interface that can be used for almost any type of device.

SSL (Secure Sockets Layer) A commonly used protocol developed by Netscape for transmitting private documents via the Internet. SSL works by using a public key to encrypt data that is transferred over the SSL connection. The SSL protocol secures the following data: I/O, serial port, and VSIP communication; it does not apply to audio and video transmission.

Transceiver (Transmitter/Receiver) A device that both transmits and receives analog or digital signals.

Transmitter A device sending video signals captured with a connected camera or dome to a receiver. The transmitter converts the analog signal into a digital form before transmitting it. Also called *encoder*.

Video Server A unit transmitting or receiving video signals through an IP network. The SmartSight wireless servers are the S1000w and S1100w units; the wired servers are the S1500e series, S1600e, S1700e series, and S1708e series units.

VSIP (Video Services over IP) A proprietary communication protocol for sending messages between a computer and a SmartSight unit, or between two units.

WAN (Wide Area Network) A computer network that spans a relatively large geographical area. Typically, a WAN consists of two or more local area networks (LANs).

WEP (Wired Equivalent Privacy) A security protocol for wireless local area networks (WLANs) defined in the 802.11b standard. It is designed to afford wireless networks the same level of protection as a comparable wired network.

Wireless Cell A group of wireless devices that communicate together on the same radio frequency channel and share the same wireless passkey.

Wireless Transmission A technology in which electronic devices send information to receivers using radio waves rather than wiring.

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Compliance

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the effective isotropic radiated power (EIRP) is not more than that required for successful communication.

Note: The S1100 units require professional installation. They should be installed in a location that would prevent the general population from approaching from 3 feet (1 meter) of the radiating element.

USA

This device complies with part 15 of the FCC (Federal Communications Commission) rules (see http://www.fcc.gov/).

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation of the device.

This equipment has been tested and found to comply with the limits for Class B Digital Device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. This equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the S1100 unit
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Any changes or modifications not expressly approved by Verint Video Solutions could void the user's authority to operate the equipment.

Canada

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

Italia

L'uso di questo apparato in Italia è regolamentato da:

- D.Lgs 1.8.2003, n.259, articoli 104 (attività soggette ad autorizzazione generale) e 105 (libero uso), per uso privato;
- D.M. 28.5.03, per la fornitura al pubblico dell'accesso alle reti e ai servizi di telecomunicazioni (R-LAN or R-LAN and Hiperlan).

Europe

Declaration of Conformity

Manufacturer:

Verint Systems Inc.
1800 Berlier
Laval, Québec
H7L 4S4
Canada

Declares under sole responsibility that the product:

Product name: Wireless video transceiver
Model number: S1100-CE-5x, S1100-CE-24

To which this declaration relates is in conformity with the following standards or other documents:

R&TTE Directive 1999/5/EC

EN 300 328-2 V1.2.1 (2001-12)
EN 301 893 V1.2.3 (2003-08)
EN 301 489-01 V1.4.1 (2002-08)
EN 301 489-17 V1.2.1 (2002-08)
EN 60950:2000

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

May 6th, 2004
Laval, Canada

Willie Kouncar
Vice President, Product development
Verint Video Solutions

Turkey

Declaration of Conformity

Manufacturer:

Verint Systems Inc.
1800 Berlier
Laval, Québec
H7L 4S4
Canada

Declares under sole responsibility that the product:

Product name: Wireless video transceiver
Model number: S1100-TR-12VDC-24, S1100-TR-24VAC-24

To which this declaration relates is in conformity with the following standards or other documents:

R&TTE Directive 1999/5/EC

EN 300 328-2 V1.2.1 (2001-12)
EN 301 489-01 V1.4.1 (2002-08)
EN 301 489-17 V1.2.1 (2002-08)
EN 60950:2000

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

December 14th, 2004
Laval, Canada

Willie Kouncar
Vice President, Product development
Verint Video Solutions

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