RTS Digital Matrix Intercom

SNMP

&

AZedit

Application Note

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CHAPTER 1

Introduction and Installation

General Description

The **SNMP** (Simple Network Management Protocol) protocol is used by network management systems to communicate with network devices. Bosch Security Systems, Inc. networked devices (intercom controllers, TM-2000, RVON devices etc.) include an SNMP agent that allows them to be queried by an SNMP manager.

SNMP Messages

SNMP messages may be initiated by either the **NMS** (Network Management System) or by the network device.

An **SNMP get** is a message initiated by the NMS when it wants to retrieve some data from a network device. For example, the network management system might query a router for the utilization on a **WAN** (Wide Area Network) link every five (5) minutes. It could then create charts and graphs from that data, or it could warn the operator when the link is overutilized.

An **SNMP set** is a message initiated by the NMS when it wants to change data on a network device. For example, the NMS may alter a static route on a router.

An **SNMP trap** is a message initiated by a network device and sent to the NMS. For example, a router could send a message if one of its redundant power supplies fails, or a printer could send an SNMP trap when it is out of paper.

SNMP MIB

The SNMP **MIB** (Management Information Base) module documents the information available to SNMP. The agent implements the MIB. For example, when a manager queries an OID, the agent generates a response which includes the value of the object with that OID. Each object is identified by an object ID. The manager reads the MIB to know what can be queried and how to interpret the results.

The MIB is extensible, which means hardware and software manufacturers can add new variables to the MIB. The MIB defines what objects are implemented by the network device. The NMS reads the MIB files to determine what objects can be read and monitored.

Installation

Requirements

The following are the minimum firmware versions with SNMP support.

- ZEUS-III v1.0.0 or later
- Cronus v1.3.0 or later
- ADAM MCII-e (single-frame) v1.3.0 or later
- ADAM MCII-e (Tri-Bus support) v2.2.0 or later
- ADAM PeriphII-e (with DBX) v1.17.0 or later
- TM-2000 v8.7.0 or later
- RVON (all variants) v2.0.0 or later

To **configure the SNMP environment**, do the following:

Step 1 Verify your SNMP Monitor software is installed properly.

NOTE: Bosch Security Systems, Inc does not supply, nor recommend, any specific SNMP monitoring/managing software. It is the user's responsibility to acquire and install a third-party SNMP monitoring/managing software.

Step 2 Install the supplied Bosch Security Systems, Inc MIB files. These files include:

- Telex-REG.mib
- Telex-Icom-MIB.mib
- Telex-Icom-TC.mib
- Telex-RVON-CAP.mib
- Telex-RVON-MIB.mib
- Telex-TM-CAP.mib
- Telex-TM-MIB.mib
- Telex-ADAM-CAP.mib

Step 3 Configure SNMP via AZedit.

Step 4 Configure SNMP via RVONedit, if desired.

Step 5 Configure SNMP via TrunkEdit, if desired.

SNMP Configuration Window

The **SNMP Configuration** window in AZedit, shown in Figure 1, is used to configure SNMP for your intercom system.

NAVIGATION: From the menu bar in AZedit, select **Options|SNMP Configuration**.

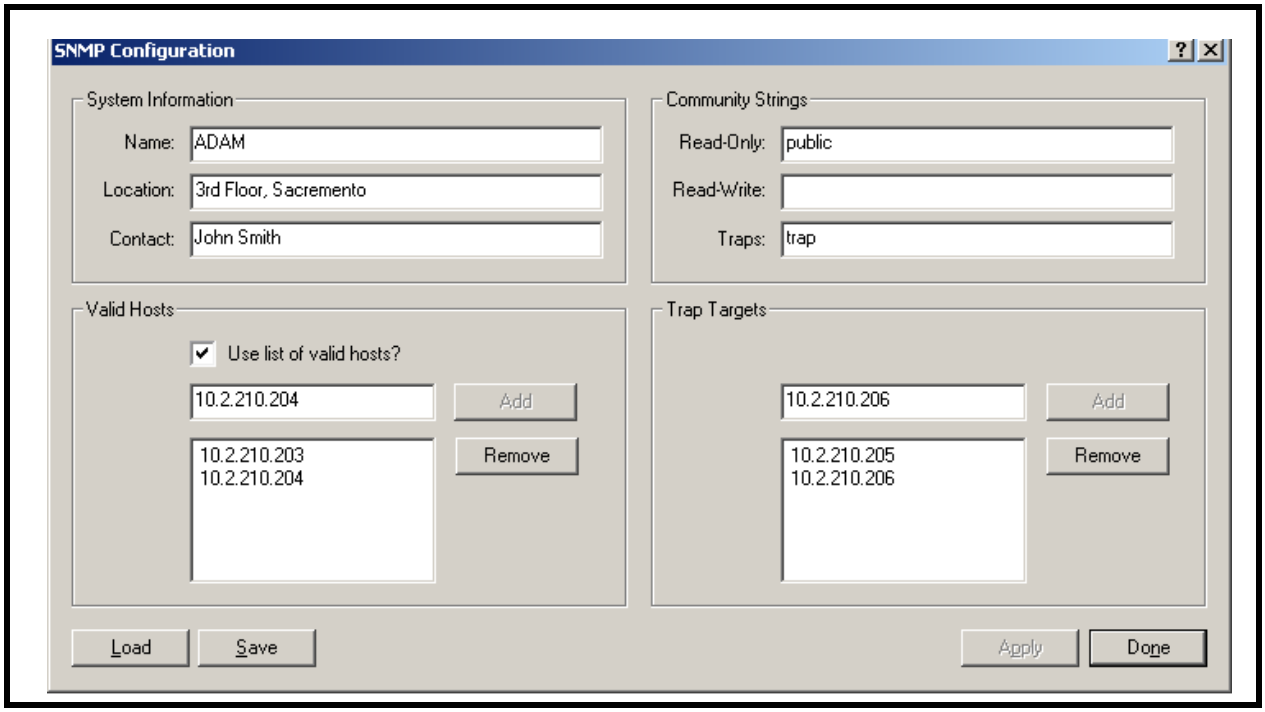

FIGURE 1. SNMP Configuration Window

System Information Group Box

The **System Information** group box is used for documentation purposes. This is so the user knows which device is configured and where it is physically located.

Name Field

The **Name** field identifies the name of the intercom system in which SNMP is configured.

This field can contain up to *255 characters*.

Location Field

The **Location** field identifies the physical location of the intercom system (for example, 3rd floor, Sacramento).

This field can contain up to *255 characters*.

Contact Field

The **Contact** field identifies the name of the person responsible for the specified SNMP device.

This field can contain up to *255 characters*.

Community Strings Group Box

The Community Strings group box is used to define the level of security to use when queries are submitted. SNMP Community Strings are like passwords for network devices.

Most often, there is one (1) community string used for read-only access to a network device. The default value for this community string is often *public*. Using this community string like a password, the NMS retrieves data from network devices.

Read-Only Field

The **Read-Only** field displays the password that provides read-only access via SNMP.

This field can contain up to *64 characters*.

The default entry is *public*.

Read-Write Field

The **Read-Write** field displays the password that provides read-write access via SNMP. If the Read-Write field is empty, SNMP is limited to read-only access.

This field can contain up to *64 characters*.

Traps Field

The **Traps** field displays the trap identifier for the SNMP event monitor. The traps community string specifies the community string included in all SNMP traps generated by the intercom.

This field can contain up to *64 characters*

The default entry is *trap*.

NOTE: An SNMP trap is a notification event issued by a managed device (the intercom system) to the network management system when an event or error occurs. When an event or error occurs, the notification includes the trap community string.

Valid Hosts Group Box

Use List of Valid Hosts? Check Box

The **Use List of Valid Hosts?** check box is used to allow queries by the specified SNMP monitoring machines. You can specify the IP Address of these machines in the Valid Host list.

- If this box is selected, then only devices included in the list of valid hosts are allowed to send SNMP requests to the device. If the device (TM-2000, MCII-e, etc.) receives an SNMP request, and the sender's IP address does not appear in the list of valid hosts, then the request is silently discarded.
- If the box is not selected, then the targeted device responds to any and all SNMP requests, no matter the sender's IP address.

Valid Host Entry Field

The **Valid Host** entry field is used to add up to five (5) IP Addresses of host machines that accept SNMP requests.

NOTE: You must enter a valid IP Address structure for the Add button to become active.

Valid Host List

The **Valid Host** list displays the IP Addresses of the machines that are allowed to generate SNMP queries.

Add Button

The **Add** button adds the specified IP Address structure for the Add button to become active.

NOTE: You must enter a valid IP Address structure for the Add button to become active.

Remove Button

The **Remove** button removes the selected IP Address from the trap target list. You can only remove one (1) IP Address at a time.

Trap Targets Group Box

Trap Target Entry Field

The **Trap Target** entry field displays the IP Address of the computers where the trap messages are sent. You can have up to five (5) devices configured to accept these messages.

NOTE: You must enter a valid IP Address for the Add button to become active.

Trap Target List

The **Trap Target** list displays a list of all the IP Addresses (computers) where you want trap messages sent.

Add Button

The **Add** button adds the IP Address in the trap target entry field to the trap target list.

NOTE: You must enter a valid IP Address for the Add button to become active.

Remove Button

The **Remove** button removes the selected IP Address from the Trap Target list. You can only remove one (1) IP Address at a time.

Load Button

The **Load** button is used to read an SNMP file. Once the file has been read, you can modify the settings and save or apply them.

Save Button

The **Save** button is used to save the current SNMP settings to a disk file. The default directory for SNMP files is defined in Preferences, on the Advanced page (Options | Preferences | Advanced).

Apply Button

The **Apply** button sends all changes to the intercom. It does not close the active window.

Done Button

The **Done** button closes the current window after an Apply has been made. The Done button is the default button seen on the SNMP configuration window.

Cancel Button

The **Cancel** button closes the current window without saving or applying any modifications made. The Cancel button appears only after you modify the settings or load new settings from a file. Otherwise, the Done button is shown.

CHAPTER 2

Object IDs

Introduction

An **OID** (Object ID) is a numeric string used to identify an object. Company-specific OIDs are created by building upon the private enterprise number, which is always 1.3.6.1.4.1. The Bosch Security System (Telex) private enterprise number is 24287 (see Figure 2). Everything below this number are customized OIDs that elicit specific information pertaining to Bosch Security Systems intercoms.

The standard Bosch Security Systems (Telex) SNMP kickoff structure is: 1.3.6.1.4.1.24287

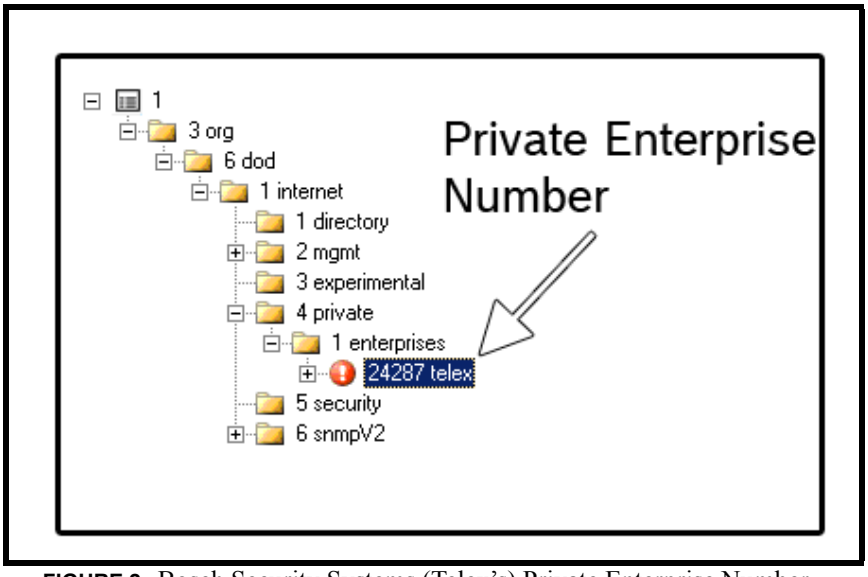

FIGURE 2. Bosch Security Systems (Telex's) Private Enterprise Number

NOTE: The following object folders are contained within the 24287 Telex enterprise:

6.2 Intercom objects
6.3 RVON objects
6.4 TM-2000 objects

Matrix OID Table

TABLE 1. Matrix

OID	ID	Description
Architecture - 1.3.6.1.4.1.24287.6.2.1		
6.2.1.2	icNumFrames	The total number of frames in the system
6.2.1.3	icNumLinks	The total number of interframe links in the intercom. For a single frame ADAM intercom, this is zero (0). For a DBX system, with X number of frames, with X number of DBX cards per frame, this number would be X number of frames multiplied by X number of frames. For Cronus, this is 3. Cronus supports up to four (4) frames, linked in a linear chain.
6.2.1.4	icNumDeviceTypes	The number of different device types.
icDeviceTable – This table shows the number of devices in the intercom for each device type. The number of entries in this table is given by the value of icNumDeviceTypes.		
6.2.1.5.1.1	dtIndex	The device type.
6.2.1.5.1.2	dtCount	The number of devices of that type.
6.2.1.5.1.3	dtQryVersion	Indicates whether the intercom supports the ability to query the device for its firmware version.
portHWTable – For each port, information about where that port connects (frame, I/O card number, port number on that I/O card).		
6.2.1.6.1.1	hwPortNum	The port number.
6.2.1.6.1.2	hwFrame	The frame in which the I/O card for this card resides.
6.2.1.6.1.3	hwIoCard	The card number within the frame in which the port resides. The card number is 0, if it does not apply (i.e., Zeus III).
6.2.1.6.1.4	hwPortOnCard	The port number on the I/O card (or the intercom port number if the I/O card number is 0).
Capabilities -1.3.6.1.4.1.24287.6.2.2		
6.2.2.1	icNumCapabilities	The number of entries in the Capabilities table (the number of possible resource types).
CapabTable – Capabilities Table -A flag indicating whether a specific capability exists. The number of entries is given by the value of icNumCapabilities.		
6.2.2.2.1.1	capabIndex	The capability.
6.2.2.2.1.2	capabPresent	Is the specified capability present in the intercom?
6.2.2.3	icNumResources	The number of entries in the Resources table (the number of possible resource types).
icRsrcTable – A list of features for a particular resource. The number of entries is given by the value of icNumResources.		
6.2.2.4.1.1	rsrcIndex	The resource type.
6.2.2.4.1.2	rsrcCount	The number of resources of the specified type. **NOTE:** Some entries may have item counts of zero (0), indicating there are no resources of that type in the current configuration.
6.2.2.4.1.3	rsrcHasAlphas	Are there any alphas associated with items of this resource type? In general, alphas are associated with those resources which can exist as key assignments.

TABLE 1. Matrix

OID	ID	Description
6.2.2.4.1.4	rsrcHasDescription	Are there any textual descriptions associated with items of this resource type?
Configuration - 1.3.6.1.4.1.24287.6.2.3		
icAlphaTable – A table, indexed by resource type and number, used to look up the corresponding alpha. If the Unicode capability is not present, then the icAlpha8u column returns the same data as the icalpha8 column.		
6.2.3.1.1.1	alphaType	The resource type.
6.2.3.1.1.2	alphaNum	The resource instance of the specified type.
6.2.3.1.1.3	icAlpha4	The 4-character alpha for the specified resource.
6.2.3.1.1.4	icAlpha6	The 6-character alpha for the specified resource.
6.2.3.1.1.5	icAlpha8	The 8-character alpha for the specified resource.
6.2.3.1.1.6	icAlpha8u	The Unicode alpha for the specified resource.
6.2.3.2	icDescrLength	The number of characters in a description. Depending on the firmware in the intercom, each character may be a single byte or it may be a UCS-2 Unicode character. In either case, the descriptions are transmitted via UTF-8 encoding. The number of characters in a description is a fixed length; in some intercoms this length may be configurable, but in that case requires shutting down and restarting.
icDescrTable – A table, indexed by resource type and number, used to look up the corresponding description.		
6.2.3.3.1.1	descrType	The resource type.
6.2.3.3.1.2	descrNum	The instance of a resource of the specified type.
6.2.3.3.1.3	descr	The description for the specified resource.
6.2.3.4.1	icName4	The 4-character intercom name.
6.2.3.4.2	icName6	The 6-character intercom name.
6.2.3.4.3	icName8	The 8-character intercom name.
6.2.3.4.4	icName8U	The Unicode intercom name.
ioIpTable – A table, indexed by I/O card number, specifying the IP Address of the corresponding card. An IP Address of 0.0.0.0 may indicate the card has never been configured, or there is a non-RVON card in that slot; look at the dsInfo entry of the devStatusTable to determine which case applies.		
6.2.3.5.1.1	ioNum	The I/O card number.
6.2.3.5.1.2	ioIp	The IP Address of the corresponding I/O card. The IP Address is 0.0.0.0 if the card has never been configured or if a non-RVON card is plugged into the slot.
Status - 1.3.6.1.4.1.24287.6.2.4		
6.2.4.1.1	thisMcSlot	Which controller slot (if applicable) this controller is plugged into.
6.2.4.1.3	thisMcActive	Is this controller card the active one?
6.2.4.2.1	otherMcSlot	Which controller slot (if applicable) the other controller is plugged into.
6.2.4.2.2	otherMcIp	The IP Address (if known) of the other controller card.
6.2.4.2.3	otherMcActive	Is the other controller card the active one?

TABLE 1. Matrix

OID	ID	Description
6.2.4.3	errorsCleared	Indicates the value of the sysUpTime when any error counters were last cleared. This can cause a discontinuity in error counter values (dsErrorsFrom/To) and error rates (dsErrorRateFrom/To).
devStatusTable – For each possible device, information about that device: • whether it is communicating • the device subtype (if known and applicable) • the firmware version (if applicable) • communications errors from and to that device • error rates from and to that device. The table is indexed by device type and device number.		
6.2.4.4.1.1	dsType	The device type.
6.2.4.4.1.2	dsNum	The instance for a specific device type.
6.2.4.4.1.3	dsTalking	Is the device currently communicating?
6.2.4.4.1.4	dsInfo	Specific information about the device type for the indicated device, if available. For example, for I/O cards, this indicates the type of I/O card (AIO-8, RVON-16, etc.) that is plugged into a particular slot.
6.2.4.4.1.5	dsVersion	A text string describing the device's firmware version. If the version is unavailable (e.g., the device is not communicating, or does not report its firmware version), the string may be empty, or it may display the string *n/a*.
6.2.4.4.1.6	dsErrorsFrom	A count of the number of errors which have occurred in messages received from that device. Errors from/to a device are those occurring between that device and the next device upstream (towards the active controller). errorsCleared can be used to determine whether there has been a possible discontinuity because some error counters were cleared.
6.2.4.4.1.7	dsErrorsTo	A count of the number of errors which have occurred in messages sent to that device. Errors from/to a device are those occurring between that device and the next device upstream (towards the active controller). errorsCleared can be used to determine whether there has been a possible discontinuity because some error counters were cleared.
6.2.4.4.1.8	dsErrorRateFrom	A gauge indicating how many errors have occurred recently in messages received from the device.
6.2.4.4.1.9	dsErrorRateTo	A gauge indicating how many errors have occurred recently in messages sent to the device.
errorThresholdTable – A table containing the error rate threshold for each device type in the system. The threshold determines when an event notification is generated to indicate that there are excessive errors being generated in communicating with a particular device.		
6.2.4.6.1.1	threshType	The resource type.

TABLE 1. Matrix

OID	ID	Description
6.2.4.6.1.2	threshValue	The threshold for the error rate for this type of device. A notification is generated only when the error rate for a device exceeds the threshold value for the corresponding device type. **NOTE:** The error rate is prorated for the first 10 minutes after start up or after the errors are cleared. If a single error occurs within a minute after the errors are cleared, the corresponding error rate is 10. The threshold should be set to a value greater than 10 if it is desired that isolated errors do not trigger a notification.
linkStatusTable – A table containing the status of all inter-frame links in the system. A link goes between two (2) frames. In certain systems, the links go between specific cards, in which case lsCard1 and lsCard2 identify the card numbers within the frames. Otherwise, when the links endpoints are just the frames, lsCard1 and isCard2 is 0. A frame or a card typically has two (2) links (A and B), in which case lsWhichLink1 and lsWhichLink2 identify the connection at each end. Some systems have fully redundant audio links. In this case, lsRedundant identifies the table entry of the redundant link. A link carries audio in both directions. Normally, when a link is up, the audio in both directions is used. However, in a system with (full or partial) audio redundancy, it is possible for the link audio to be used in one (1) direction but not the other. The lsAudio1to2 and lsAudio2to1 indicates the direction the audio is being used. This table is indexed by the link number. The total number of entries is the total number of links, which is available in icNumLinks.		
6.2.4.7.1.1	lsLinkNum	The link number.
6.2.4.7.1.2	lsFrame1	The lower-numbered frame to which this link connects.
6.2.4.7.1.3	lsCard1	The I/O card number to which this link connects in the lower-numbered frame. If the link goes between frames, but not between specific cards, this value is 0.
6.2.4.7.1.4	lsWhichLink1	Which of the two (2) connections on lsFrame1/lsCard1 this link uses.
6.2.4.7.1.5	lsFrame2	The high-numbered frame to which this link connects.
6.2.4.7.1.6	lsCard2	The I/O card number to which this link connects in the higher-numbered frame. If this link goes between frames, but not between cards, this value is zero (0).
6.2.4.7.1.7	lsWhichLink2	Which of the two (2) connections on lsFrame2/lsCard2 this link uses.
6.2.4.7.1.8	lsRedundant	Identifies the link which provides full audio redundancy for this link. If the intercom doesn't support fully redundant audio, this field is 0.
6.2.4.7.1.9	lsLinkUp	Indicates whether the link is currently up or down.
6.2.4.7.1.10	lsAudio1to2	Indicates whether the link is currently passing audio from lsFrame1 to lsFrame2.
6.2.4.7.1.11	lsAudio2to1	Indicates whether the link is currently passing audio from lsFrame2 to lsFrame1.

RVON OID Table

TABLE 2. RVON

OID	ID	Description
Configuration - 1.3.6.1.4.1.24287.6.3.1		
6.3.1.2	numGpioInputs	The number of general purpose inputs supported by the device.
6.3.1.3	numGpioOutputs	The number of general purpose outputs supported by the device.
ChanCfgTable – A table defining the configuration of each audio channel.		
6.3.1.4.1.1	ccChan	The VOIP channel number.
6.3.1.4.1.2	ccPartnerIp	The IP Address of the RVON device to which this channel connects.
6.3.1.4.1.3	ccPartnerType	The type of RVON device to which this channel connects.
6.3.1.4.1.4	ccPartnerChan	The VOIP channel of the RVON device to which this channel connects.
6.3.1.4.1.5	ccCodec	The preferred codec to use.
6.3.1.4.1.6	ccPktSizeMsec	The preferred packet size to use (in mSec).
6.3.1.4.1.7	ccPktSizeBytes	The preferred packet size to use (in Bytes).
6.3.1.4.1.8	ccVad	Should VAD be enabled for this channel?
6.3.1.4.1.9	ccVadThreshold	The VAD threshold. The valid range is *-60dBm to -30dBm*. A value of -99 indicates the threshold is set to adaptive.
6.3.1.4.1.10	ccDescription	A text string used to provide identifying information about the channel.
ioGainTable – The current gain setting for each channel.		
6.3.1.5.1.1	iogChan	The VOIP channel number.
6.3.1.5.1.2	iogGainNetRx	The gain (or loss) applied to audio received from the network. A loss of 2.5dB would be represented as a value of -25.
6.3.1.5.1.3	iogGainNetTx	The gain (or loss) applied to audio transmitted to the network. A loss of 2.5dB would be represented as a value of -25.
passthroughCfgTable – A table defining the configuration of the pass-through serial port.		
6.3.1.6.1.1	ptcfgPort	The pass-through channel number.
6.3.1.6.1.2	ptcfgIp	The IP Address of the partner RVON device for serial pass-through data.
6.3.1.6.1.3	ptcfgSpeed	The configured speed of the serial port.
6.3.1.8	deviceDescription	A text string used to provide identifying information about the RVON device.
6.3.1.9	numPassthroughPorts	The number of pass-through serial ports in this device.
Status - 1.3.6.1.4.1.24287.6.3.2		
chanStatTable – A table giving the current connection status of all channels.		
6.3.2.1.1.1	csChan	The VOIP channel number.
6.3.2.1.1.2	csPortNum	The intercom port number, if known; otherwise 0. For devices that do not plug into an intercom frame, such as RVON-1 and RVON-I/O, csPortNum reports 0.
6.3.2.1.1.3	csIsUp	Is the VOIP channel up?
6.3.2.1.1.4	csPanelPresent	Is there a keypanel connected on this channel?

TABLE 2. RVON

OID	ID	Description
6.3.2.1.1.5	csUpTime	How long the VOIP channel has been up. If the VOIP channel is not currently up, csUpTime reports 0.
6.3.2.1.1.6	csCodec	The codec in use. This may differ from ccCodec if the devices at the two (2) ends of the channel are not configured with the same codec.
6.3.2.1.1.7	csPktSizeMsec	The size of each packet expressed in mSec. This may differ from ccPktSizeMsec if the devices at the two (2) ends of the channel are not configured identically.
6.3.2.1.1.8	csPktSizeBytes	The number of bytes of audio data in each packet. This depends purely on csCodec and csPktSizeMsec.
6.3.2.1.1.9	csVad	Is VAD currently in use for this channel?
6.3.2.1.1.10	csNumConnects	The number of times the VOIP connection has been established.
6.3.2.1.1.11	csNumUnderruns	The number of times an underrun occurred because there is no packet available to play. **NOTE:** If VAD is enabled, packet underruns occur continuously during periods of low audio level.
6.3.2.1.1.12	csNumOverruns	The number of packets discarded because the playout buffer is full.
6.3.2.1.1.13	csNumMissedSeqPkts	The number of packets missed, calculated based on packet sequence numbers.
6.3.2.1.1.14	csNumReplayedPkts	The number of packets replayed.
6.3.2.1.1.15	csAvgJitter	The average jitter time, which is an indication of how much variation there is in packet arrival time.
6.3.2.1.1.16	csPlayoutBufferSize	The playout buffer size. This indicates how many packets can be received and held pending playout before an overrun error occurs.
6.3.2.1.1.17	csNomPlayoutDelay	How much audio must be received before playout begins.
6.3.2.1.1.18	csAvgPlayoutDelay	The average delay between when an audio sample is received and when it starts playing.
6.3.2.1.1.19	csVoicePktsTxd	The number of audio packets transmitted.
6.3.2.1.1.20	csVoicePktsRxd	The number of audio packets received.
6.3.2.1.1.21	csDtmfRelayPktsTxd	The number of DTMF relay packets transmitted. DTMF relay packets are used to transmit DTMF information, reducing the required audio bandwidth.
6.3.2.1.1.22	csDtmfRelayPktsRxd	The number of DTMF relay packets received. DTMF relay packets are used to transmit DTMF information, reducing the required audio bandwidth.
6.3.2.1.1.23	csSilenceDetectedPktsTxd	The number of times a silence packet is transmitted instead of a normal audio packet. Silence packets are only sent if VAD is enabled.
6.3.2.1.1.24	csSilenceDetectedPktsRxd	The number of silence packets received. Silence packets are only sent if VAD is enabled.
6.3.2.1.1.25	csSuppressedSilencePktsTx	The number of audio packets discarded instead of being sent because they only contain silence.
6.3.2.1.1.26	csMinPktIntervalTimeRx	The minimum arrival time between consecutive received audio packets.
6.3.2.1.1.27	csMaxPktIntervalTimeRx	The maximum arrival time between consecutive received audio packets.

TABLE 2. RVON

OID	ID	Description
passthroughStatTable – A table providing statistics for the pass-through serial ports (serial to network and network to serial)		
6.3.2.3.1.1	ptstatPort	The pass-through port channel number.
6.3.2.3.1.2	ptstatSnBytes	The number of bytes received from the serial port and forwarded on the network to another RVON device.
6.3.2.3.1.3	ptstatSnErrors	The number of errors that occurred in trying to receive data on the serial port.
6.3.2.3.1.4	ptstatNsBytes	The number of bytes received from the serial port and forwarded on the network and transmitted on the serial port.
6.3.2.3.1.5	ptstatNsErrors	The number of errors that occurred in trying to transmit data (received from the network) on the serial port.
6.3.2.4.1	gsInputs	The status of the local general purpose inputs. The status is sent as a sequence of octets. The mapping of octet string bits to GPI status is as follows: Octet #1 Octet #2 ... MSB ... LSB MSB ... LSB ... -- -- -- -- -- -- -- -- -- GPI #: 8 ... 1 16 ... 9 ... numGpioInputs can be used to determine the total number of octets in the response, and the number of significant bits in the last octet.
6.3.2.4.2	gsOutputs	The status of the local general purpose outputs. The status is sent as a sequence of octets. The mapping of octet string bits to GPI status is as follows: Octet #1 Octet #2 ... MSB ... LSB MSB ... LSB ... -- -- -- -- -- -- -- -- -- GPI #: 8 ... 1 16 ... 9 ... numGpioOutputs can be used to determine the total number of octets in the response, and the number of significant bits in the last octet.
nwErrTable – A table listing various network-related errors for each channel.		
6.3.2.5.1.1	nwChan	The VOIP channel.
6.3.2.5.1.2	nweBadHeader	The number of packets discarded due to invalid data in the message header.
6.3.2.5.1.3	nweBadMAC	The number of packets discarded because of an invalid authentication code in the header.
6.3.2.5.1.4	nweBadSSRC	The number of packets discarded because of an invalid SSRC field.
6.3.2.5.1.5	nweBadPayload	The number of packets discarded because the data is formatted incorrectly.
6.3.2.5.1.6	nweBadDest	The number of packets discarded because they specified no destination.
6.3.2.5.1.7	nweLostPkts	The number of packets never received from the network.
6.3.2.5.1.8	nweMicroOverrun	The number of packets which were handled by the DSP but then lost because the processor is too busy to handle them.

Trunk Master OID Table

TABLE 3. Trunk Master

OID	ID	Description
TM Architecture - 1.3.6.1.4.1.24287.6.4.1		
6.4.1.1	tmStdbyIpAddr	The IP Address of the Trunk Master which is the active/standby partner of this device. If the TM is configured for standalone operation tmStdbyIpAddr is 0.
6.4.1.2	tmNumIcomPorts	The number of physical RS-485 ports available for communications with intercoms. This is determined by the number of installed serial cards; also, VDP support (if enabled) uses the first channel of the first serial card.
6.4.1.3	tmVdpEnabled	Indicates whether or not VDP support is enabled. If enabled, the first RS-485 port normally used for communications with intercoms is instead reserved for communications with a VDP controller.
6.4.1.4	tmVersion	A text string describing the TM-2000 firmware version.
TM Capabilities - 1.3.6.1.4.1.24287.6.4.2		
6.4.2.1	tmNumIcoms	The maximum number of intercoms that can be trunked together.
6.4.2.2	tmNumTrunks	The maximum number of trunks that can be defined.
6.4.2.3	tmNumFnTypes	The number of scrollable function types supported by the Trunk Master.
6.4.2.4	tmNumGroups	The number of intercom groups supported. Intercom groups are used in connection with the keypanel's trunk priorities for controlling access to remote scroll lists. A keypanel with a trunk priority of 0 cannot access any remote scroll lists. A keypanel with a trunk priority of 10 can access any remote scroll list. A keypanel connected to intercom X, with a trunk priority between 1 and 9, can access scroll lists for intercom Y if there is at least one (1) intercom group of which both X and Y are members.
6.4.2.5	tmNumCapabs	The number of entries in the Capabilities table.
tmCapabTable – A table indicating which capabilities are supported by the Trunk Master.		
6.4.2.6.1.1	tmCapabIndex	The capability.
6.4.2.6.1.2	tmCapabPresent	Does the Trunk Master support the specified capability?
TM Configuration - 1.3.6.1.4.1.24287.6.4.3		
tmIcomTable – A table of intercom definitions. Each entry contains one (1) intercom definition. The entry contains the alphas for the intercom as well as details of how it connects to the Trunk Master (the COM port and the baud rate). If the intercom is not defined, icomAlpha4 is 4 bytes of 0.		
6.4.3.1.1.1	icomIndex	The intercom number.
6.4.3.1.1.2	icomAlpha4	The 4-character intercom name. An intercom is undefined if the 4-character name is all 0s.
6.4.3.1.1.3	icomAlpha6	The 6-character intercom name.
6.4.3.1.1.4	icomAlpha8	The 8-character intercom name.
6.4.3.1.1.5	icomAlpha8u	The Unicode intercom name.
6.4.3.1.1.6	icomComPort	The RS-485 port this intercom is connected. It is possible for an intercom to be defined but for the COM port to be 0 (not defined), in which case the intercom communication status isTalking is false.

TABLE 3. Trunk Master

OID	ID	Description
6.4.3.1.1.7	icomBaudRate	The baud rate at which the Trunk Master communicates with the intercom. Typical baud rates are 38400 for a locally connected intercom and 9600 baud for a remote intercom.
tmTrunkTable – A table of trunk definitions. A trunk is a bi-directional audio connection between one (1) port in one (1) intercom and one (1) port in a different intercom. The two (2) ends of the trunk are arbitrarily designated *from* and *to*. The ends correspond to how the trunk is defined in TrunkEdit. A trunk is not defined unless there are (non-0) definitions for tkFromIcom, tkFromPort, tkToIcom, and tkToPort. TrunkEdit can partially define trunks; however, only complete trunk definitions appear in tmTrunkTable. Trunks can be marked as cascadable. A trunk from intercom A to intercom B can be cascaded with a trunk from intercom B to intercom C, to create a virtual trunk going from intercom A to intercom C.		
6.4.3.2.1.1	tkNum	The trunk number.
6.4.3.2.1.2	tkFromIcom	The intercom number to which the first end of the trunk is connected.
6.4.3.2.1.3	tkFromPort	The port to which the first end of the trunk is connected.
6.4.3.2.1.4	tkToIcom	The intercom number to which the second end of the trunk is connected.
6.4.3.2.1.5	tkToPort	The port to which the second end of the trunk is connected.
6.4.3.2.1.6	tkCanCascade	A flag indicating whether this trunk can be cascaded with another trunk to create a virtual trunk.
6.4.3.2.1.7	tkFixed	A flag indicating whether this trunk is fixed at either end. If a trunk is fixed at one (1) end, it can only be used for that specific assignment. (Most trunks are not fixed.) The tmTrunkTable does not provide a method of querying what functions a trunk is fixed to.
tmAlphaTable – The table of alphas for scrollable intercom resources. This table is sparse. For a given intercom and function type, the various entries need not have contiguous function numbers.		
6.4.3.3.1.1	taIcomNum	The intercom number.
6.4.3.3.1.2	taFnType	The function type.
6.4.3.3.1.3	taFnNum	The function number.
6.4.3.3.1.4	taAlpha4	The 4-character alpha.
6.4.3.3.1.5	taAlpha6	The 6-character alpha.
6.4.3.3.1.6	taAlpha8	The 8-character alpha.
6.4.3.3.1.7	taAlpha8u	The Unicode alpha.
tmGroupNameTable – A table of intercom group names.		
6.4.3.4.1.1.1	gnNum	The intercom group number.
6.4.3.4.1.1.2	gnName	The intercom group name. This is a sequence of characters, either ASCII or Unicode, transmitted via ASCII or UTF-8 encoding.
tmGroupMembTable – The intercom group membership table. Membership of one (1) intercom in one (1) group. One (1) intercom can be a member of zero (0), one (1) or multiple groups. See the description of tmNumGroups.		
6.4.3.4.2.1.1	gmGroupNum	The intercom group number.
6.4.3.4.2.1.2	gmIcomNum	The intercom number.
6.4.3.4.2.1.3	gmIsMember	Indicates whether the specified intercom is a member of the specified group.

TABLE 3. Trunk Master

OID	ID	Description
6.4.3.5.1	optWaitForTalk	Indicates if wait-for-talk is enabled. If wait-for-talk is enabled, then an audio path is not necessarily established when a listen key is turned on.
6.4.3.5.2	optDynamicAlloc	Indicates if dynamic allocation is enabled, then a trunk is deallocated as soon as it stops being used (trunks never have allocations on them unless they are actively being used).
6.4.3.5.3	optAutoClear	Indicates if auto-clear is enabled. If auto-clear is enabled, once a trunk stops being used, the allocations on that trunk are automatically cleared after a time-out. This flag is ignored if Dynamic Allocation is in effect.
6.4.3.5.4	optClearAllocTimeOut	The time-out after a trunk allocation stops being used before the trunk allocation is cleared. This time-out is ignored if dynamic allocation is enabled (trunks are cleared immediately) or if auto-clear is disabled (trunks aren't automatically cleared).
6.4.3.5.5	optLogEnabled	Indicates whether trunk logging is enabled. If logging is enabled, there must be a TrunkEdit session connected to the Trunk Master via the serial port in order to upload the log messages and save them to disk.
TM Status - 1.3.6.1.4.1.24287.6.4.4		
6.4.4.1	tmErrorsCleared	Indicates the value of sysUpTime when any error counters were last cleared. This can cause a discontinuity in error counter values (ot/isErrorsFrom/To) and error rates (ot/isErrorRateFrom/To).
6.4.4.2.1	thisTmActive	Is this the active Trunk Master?
6.4.4.3.2	otPresent	Is the other Trunk Master (if any defined) communicating?
6.4.4.3.3	otActive	Is the other Trunk Master (if any defined) active?
6.4.4.3.4	otErrorsFrom	A count of the number of errors which have occurred in messages received from the other Trunk Master. tmErrorsCleared can be used to determine whether there has been a possible discontinuity because some error counters were cleared.
6.4.4.3.5	otErrorsTo	A count of the number of errors which have occurred in messages sent to the other Trunk Master. tmErrorsCleared can be used to determine whether there has been a possible discontinuity because some error counters were cleared.
6.4.4.3.6	otErrorRateFrom	A gauge indicating how many errors have occurred recently in messages sent to the other Trunk Master.
6.4.4.3.7	otErrorRateTo	A gauge indicating how many errors have occurred recently in messages received from the other Trunk Master.

TABLE 3. Trunk Master

OID	ID	Description
6.4.4.3.8	otThreshValue	The error rate threshold for communications with the other Trunk Master. A notification is generated only when the error rate to/from the other Trunk Master exceeds the threshold value. The error rate is prorated for the first 10 minutes after start up or after the errors are cleared. If a single error occurs within a minute after the errors are cleared, the corresponding error rate is 10. The threshold should be set to a value greater than 10 if it is desired that isolated errors do not trigger a notification.
icomStatusTable – Status of various intercoms.		
6.4.4.4.1.1	isIndex	The intercom number.
6.4.4.4.1.2	isTalking	Is the Trunk Master communicating with the intercom?
6.4.4.4.1.3	isNewProtocol	Does the intercom support the new trunking protocol? A new trunking protocol introduced in June 2000, beginning with ADAM MC version 9.10.1
6.4.4.4.1.4	isSize	The number of ports in the intercom.
6.4.4.4.1.5	isErrorsFrom	A count of the number of errors that occurred in messages received from the intercom. tmErrorsCleared can be used to determine whether there has been a possible discontinuity because some error counters were cleared.
6.4.4.4.1.6	isErrorsTo	A count of the number of errors that occurred in messages sent to the intercom. tmErrorsCleared can be used to determine whether there has been a possible discontinuity because some error counters were cleared.
6.4.4.4.1.7	isErrorRateFrom	The recent error rate for messages received from the intercom.
6.4.4.4.1.8	isErrorRateTo	The recent error rate for messages sent to the intercom.
tkStatusTable – The status of all trunks.		
6.4.4.5.1.1	tsNum	The trunk number.
6.4.4.5.1.2	tsState	The current state of the trunk.
6.4.4.6	icomThreshValue	The threshold for the error rate for intercoms. A notification is generated only when the intercom error rate exceeds the threshold value. The error rate is prorated for the first 10 minutes after start up or after the errors are cleared. If a single error occurs within a minute after the errors are cleared, the corresponding error rate is 10. The threshold should be set to a value greater than 10 if it is desired that isolated errors do not trigger a notification.

Traps OID Table

OID	ID	Description	Included OIDs
Intercom Traps – 6.2.5.0			
6.2.5.0.1	devStatusChgd	A notification that a device has started or stopped responding. The dsTalking and dsInfo instances refers to the same row in devStatTable, and can be used to identify which device's status has changed. This notification is sent whenever a device starts or stops talking. However, for each distinct icDeviceType, at most one (1) notification is sent each minute. For example, if an I/O card (with 4 panels connected to it) is removed, the controller would generate just two (2) notifications: one (1) with a dsType of ioCard, and one (1) with dsType of keypanel.	dsTalking - 6.2.4.4.1.3 dsInfo - 6.2.4.4.1.4
6.2.5.0.2	errorRateExceeded	A notification the error rate for a device (either messages to or from the device) has exceeded the corresponding threshold. The dsInfo, dsErrorRateFrom and dsErrorRateTo instances refer to the same row in devStartTable, and can be used to identify which devices status has changed. This notification is sent whenever the error rate for a device exceeds the corresponding threshold.	dsInfo - 6.2.4.4.1.4 dsErrorRateFrom - 6.2.4.4.1.8 dsErrorRateTo - 6.2.4.4.1.9
6.2.5.0.3	linkStatusChgd	A notification a link between frames has gone up or down. The instance of isLinkUp identifies which entry in linkStatusTable (i.e., which link) has changed. This notification is sent whenever a link status changes; however, it is sent at most once per minute. **NOTE:** The status of multiple links may change simultaneously (i.e., if a frame is powered on or off), but would only generate a single notification.	isLinkUp - 6.2.4.7.1.9
RVON Traps – 6.3.3.0			
6.3.3.0.1	rvLinkStatChgd	A notification an audio connection was established or terminated.	csIsUp - 6.3.2.1.1.3
6.3.3.0.2	rvPanelStatChgd	A notification a locally connected keypanel started or stopped.	csPanelPresent - 6.3.2.1.1.4
Trunk Traps – 6.4.5.0			
6.4.5.0.1	otStatusChgd	A notification the other Trunk Master has started or stopped communicating. This notification is generated at most once per minute.	otPresent - 6.4.4.3.2

OID	ID	Description	Included OIDs
6.4.5.0.2	otErrorRateExceeded	A notification otErrorRateFrom or otErrorRateTo has exceeded the threshold set in otThreshValue. This notification is sent whenever the error rate exceeds the threshold.	otErrorRateFrom - 6.4.4.3.6 otErrorRateTo - 6.4.4.3.7
6.4.5.0.3	icomStatusChgd	A notification the Trunk Master has started or stopped communicating with an intercom. The specific intercom can be determined based on the isTalking instance. This notification is generated at most once per minute.	isTalking - 6.2.4.4.1.3
6.4.5.0.4	icomErrorRateExceeded	A notification isErrorRateFrom or isErrorRateTo has exceeded the threshold set in icomThreshValue. The specific intercom can be determined based on the isErrRate instance. This notification is sent whenever the error rate exceeds the threshold.	isErrorRateFrom - 6.4.4.4.1.7 isErrorRateTo - 6.4.4.4.1.8
6.4.5.0.6	noTrunksTrap	This notification is generated when a trunking request cannot be satisfied because there are no available trunks. noTksFromIcom identifies which intercom initiated the request; noTksToIcom identifies the target intercom that cannot be reached. This notification is generated at most once per minute.	noTksFromIcom - 6.4.5.0.5.1 no_TksToIcom - 6.4.5.0.5.2

Notes

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