

VCom Inc.
(formerly WaveCom Electronics Inc.)

CableVista EAS Details and Setup Guide

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Table of Contents

1.0 Introduction.....	3
2.0 SCTE-18 Requirements	3
3.0 Audio Descriptor (0xE1).....	5
4.0 Usage of Audio Descriptor 0xE1	6
5.0 Force Tune Descriptor (0xE2)	7
6.0 Usage of Force Tune Descriptor 0xE2.....	7
7.0 Message Priority Handling	8
8.0 SCTE-18 Working Group.....	9
9.0 Timeline for Complete EAS Functionality	Error! Bookmark not defined.
10.0 CableVista In-band Configuration.....	10
11.0 CableVista Out-Of-Band Configuration.....	11
12.0 Configuring the CableVista for EAS	12

1.0 Introduction

The VCom CableVista supports EAS insertion in-band, via the GbE port, or out-of-band, via the Fast Ethernet Port (FE). This document briefly describes EAS setup and operation.

2.0 SCTE-18 Requirements

The CableVista receives EAS messages via the SCTE-18 protocol and depending on the type of message, inserts into the analog video a crawl, a crawl with audio or performs a force tune to full screen video and audio on a channel.

The `cable_emergency_alert()` message is delivered to CableVista in packets with either a PID value of 0x1FFB or 0x1FFC. Packets containing the 0x1FFB PID are in-band and packets containing the 0x1FFC are out-of-band.

The 0x1FFB PID is referenced in the PMT (program map table) for the program currently being decoded. The CableVista interprets these packets as EAS messages and sends them to all channels. Any output channel that has in-band EAS enabled will decode them and insert the appropriate message on the video. In-band EAS messages are delivered to the CableVista via the GbE input port.

Packets containing the 0x1FFC PID are out-of-band and enter the CableVista via the Fast Ethernet Port (FE). The CableVista adds these packets to all channels and any output channel that has out-of-band EAS enabled will decode them. Out-of-band packets are delivered to the Cablevista by means of the Fast Ethernet Port (FE).

The follow table describes the entire contents of an EAS message.

Table 1 - Syntax for an EAS message as defined by SCTE-18.

Syntax	Bits	Description
cable_emergency_alert(){		
table_ID	8	uimsbf value 0xD8
section_syntax_indicator	1	'1'
zero	1	'0'
reserved	2	'11'
section_length	12	uimsbf
table_id_extension	16	uimsbf '0x0000'
reserved	2	'11'
sequence_number	5	uimsbf
current_next_indicator	1	bslbf
section_number	8	uimsbf
last_section_number	8	uimsbf
protocol_version	8	uimsbf
EAS_event_ID	16	uimsbf
EAS_originator_code	24	uimsbf three ASCII
EAS_event_code_length	8	characters
EAS_event_code	8*N	uimsbf (N)
nature_of_activation_text_length	8	uimsbf N ASCII characters
nature_of_activation_text()	var	uimsbf
alert_message_time_remaining	8	uimsbf
event_start_time	32	uimsbf seconds range
event_duration	16	0..120
reserved	12	uimsbf
alert_priority	4	minutes range 15..6000
detail_OOB_source_ID	16	bslbf
reserved	6	uimsbf
details_major_channel_number	10	uimsbf
reserved	6	'111111'
details_minor_channel_number	10	uimsbf
audio_OOB_source_ID	16	'111111'
alert_text_length	16	uimsbf
alert_text()	var	uimsbf
location_code_count	8	uimsbf
		Per ATSC A/65 1, Sec.6.10
		uimsbf range 1..31

Syntax	Bits	Description
for(i=0; i<location_code_count;i++){		
state_code	8	uimsbf range
county_subdivision	4	0..99
reserved	2	uimsbf range 0..9
county_code	10	'11'
}		uimsbf range
exception_count	8	0.999
for(i=0;i<exception_count; i++){		
in_band_reference	1	uimsbf
reserved	7	
if (in_band_reference){		bslbf
reserved	6	'1111111'
exception_major_channel_number	10	
reserved	6	'111111'
exception_minor_channel_number	10	uimsbf
}		'111111'
else {		uimsbf
reserved	16	
exception_OOB_source_ID	16	
}		bslsbf
}		uimsbf
reserved	6	
descriptors_length	10	
for (i=0;i<N;i++) {		'111111'
descriptor()	var	uimsbf
}		
CRC_32	32	Optional
}		rpchhof

3.0 Audio Descriptor (0xE1)

The current SCTE-18 specification does not account for a method of informing the edge decoders how to obtain the audio stream.

VCom, with the cooperation of three EAS vendors, has added a private descriptor that handles passing the required data to insert audio with an EAS crawl message.

This information is sent in the private descriptor section of the SCTE-18 protocol.

Table 2 – CableVista Audio Descriptor.

Syntax	Bits	Description
user_private_descriptor()		
{	8	0xE1
descriptor_tag	8	0x10
descriptor_length	24	a company ID
company_ID	3	0x000
reserved	13	PID of audio stream
audio_pid	8	0x00=Initialize, 0x01=Start, 0x02=Stop
start_stop_byte	32	IGMPv2 multicast group address
igmp_group_ip	32	a single IGMPv3 include group source address
igmpv3_source_ip	16	UDP port
port_num		
}		

4.0 Usage of Audio Descriptor 0xE1

The functionality of this descriptor is limited to the implementation of the EAS device that the CableVista is working with. This descriptor is proprietary to VCom and different equipment vendors may decide to implement it in slightly different methods leading to slightly different results.

This private descriptor requires an EAS message with the same event ID to be sent to the CableVista a minimum of 3 times. The first message will inform the CableVista to initialize the audio. When the CableVista receives this message it will search for and queue up the audio. The second message will inform the CableVista to start the audio and the third message will inform the CableVista to stop the audio. This allows flexibility for starting audio and duration of the audio. It also allows flexibility for when the crawl will commence relative to the audio. This is described in more detail in the following paragraphs.

When the crawl is to commence is determined by when the alert_text_length is no longer 0. This feature is not currently defined by SCTE-18 and is handled by VCom and the EAS vendor's additions to SCTE-18 using the private descriptor. If the user wishes to send audio before the crawl commences, the user must set the alert_text_length to 0 and set no alert_text. The first packet to arrive containing alert_text and an alert_text_length > 0 will initiate the crawl.

The first time an EAS message is sent, the start_stop_byte must be set to Initialize (0x00). This is to allow the Cablevista time to set up the audio PID and prepare for the message. Since EAS messages are delivered as a best effort attempt, it is typical that multiple initialize packets may be sent.

When the audio is set to commence, a packet is sent with the start_stop_byte set to Start (0x01). This tells the Cablevista to switch to the EAS audio. Since EAS messages are delivered as a best effort attempt, it is typical that multiple start packets may be sent.

When the audio is to stop, a packet is sent with the start_stop_byte set to Stop (0x02). This tells the Cablevista to resume the original audio. Since EAS messages are delivered as a best effort attempt, it is typical that multiple stop packets may be sent.

The crawl may or may not be finished when the audio is done. The audio may be repeated if necessary. The EAS system and the user have control of this timing and may adjust it to suit their requirements.

5.0 Force Tune Descriptor (0xE2)

VCom, with the cooperation of the EAS vendors, has added a second private descriptor that handles passing the required data to force tune to a details channel on a different IP and UDP port.

This is also handled in the descriptor section of the SCTE-18 message.

Table 3 - Force Tune Descriptor

Syntax	Bits	Description
user_private_descriptor()		
{	8	0xE2
descriptor_tag	8	0x0F
descriptor_length	24	a company ID
company_ID	32	IGMPv2 multicast group address
igmp_group_ip	32	a single IGMPv3 include group source address
igmpv3_source_ip	16	UDP port
port_num	16	program number containing force tune channel
program_number		
}		

6.0 Usage of Force Tune Descriptor 0xE2

If descriptor 0xE2 is present and the alert_priority is greater than 11, all CableVista output channels that have EAS enabled are set to the specified program_number on the

specified IP address and udp port number until the alert_message_time_remaining expires. When the time expires, the channels will revert back to their original programs.

7.0 Message Priority Handling

How the CableVista is to process an EAS message is defined in the SCTE-18 specification in the following table.

Table 4 - SCTE-18 Message Priority Handling

<i>Alert Priority</i>	<i>Meaning</i>	<i>Processing</i>
0	Test message	Ignored by system.
1-2	Reserved	Treated as priority 3
3	Low priority	Alert text scroll. Supported SCTE-18 generators may accompany scroll with alert audio when the CableVista is in Gigabit ethernet mode.
4-6	Reserved	Treated as priority 7
7	Medium priority	Alert text scroll. Supported SCTE-18 generators may accompany scroll with alert audio when the CableVista is in Gigabit ethernet mode.
8-10	Reserved	Treated as priority 11
11	High priority	Alert text scroll. Supported SCTE-18 generators may accompany scroll with alert audio when the CableVista is in Gigabit ethernet mode.
12-14	Reserved	Treated as priority 15
15	Maximum priority	Tune to details channel specified in SCTE-18 message. Supported SCTE-18 generators may tune to an alternate transport stream for details channel when the CableVista is in Gigabit ethernet mode.

8.0 SCTE-18 Working Group

VCom is currently a participating member of the SCTE-18 Working Group and is actively involved in the changes that are being made to the SCTE-18 specifications. VCom is committed to supporting the final implementation of the SCTE-18 specification on the CableVista edge decoder product, as defined by the working group.

10.0 CableVista In-band Configuration

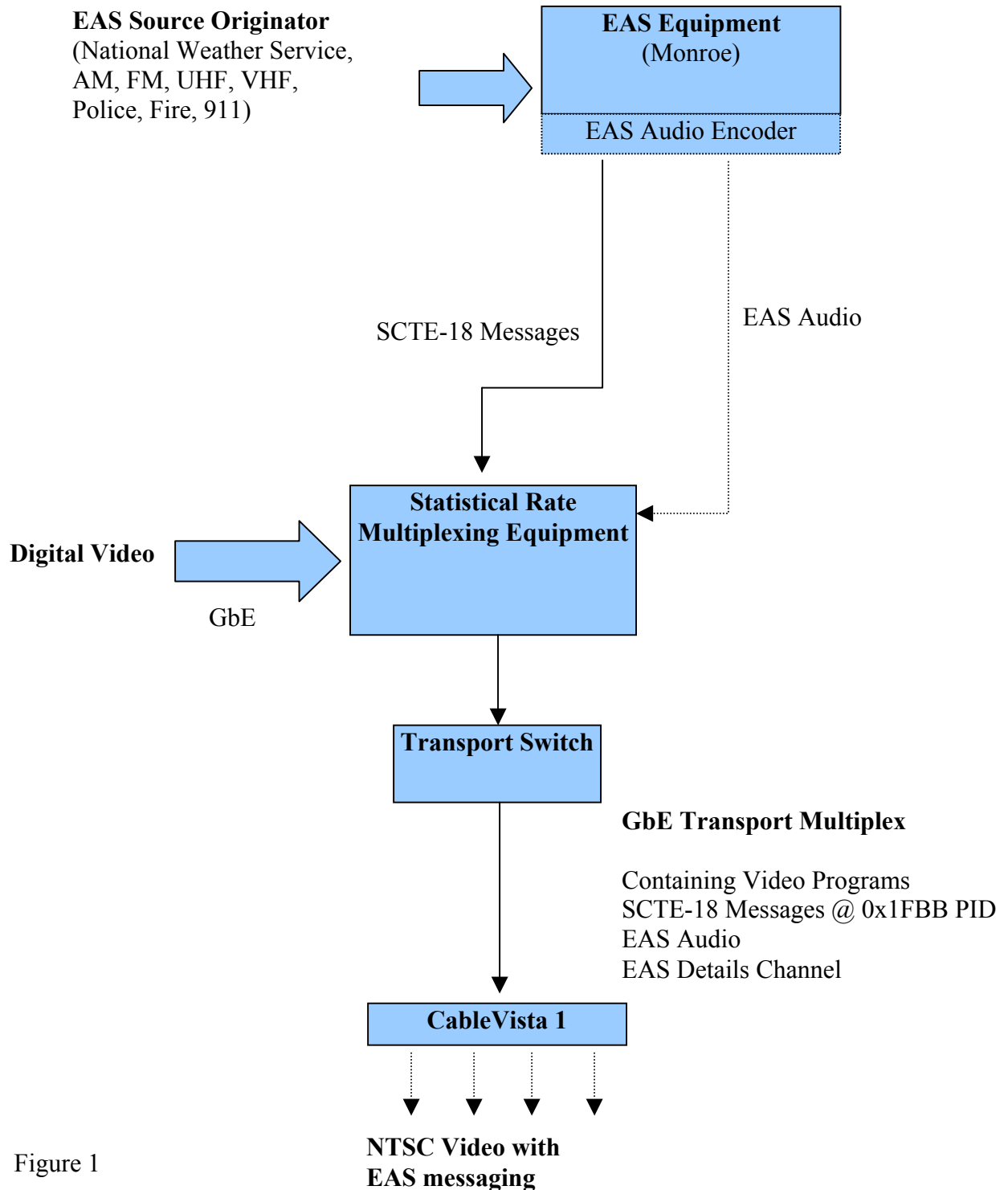


Figure 1

11.0 CableVista Out-Of-Band Configuration

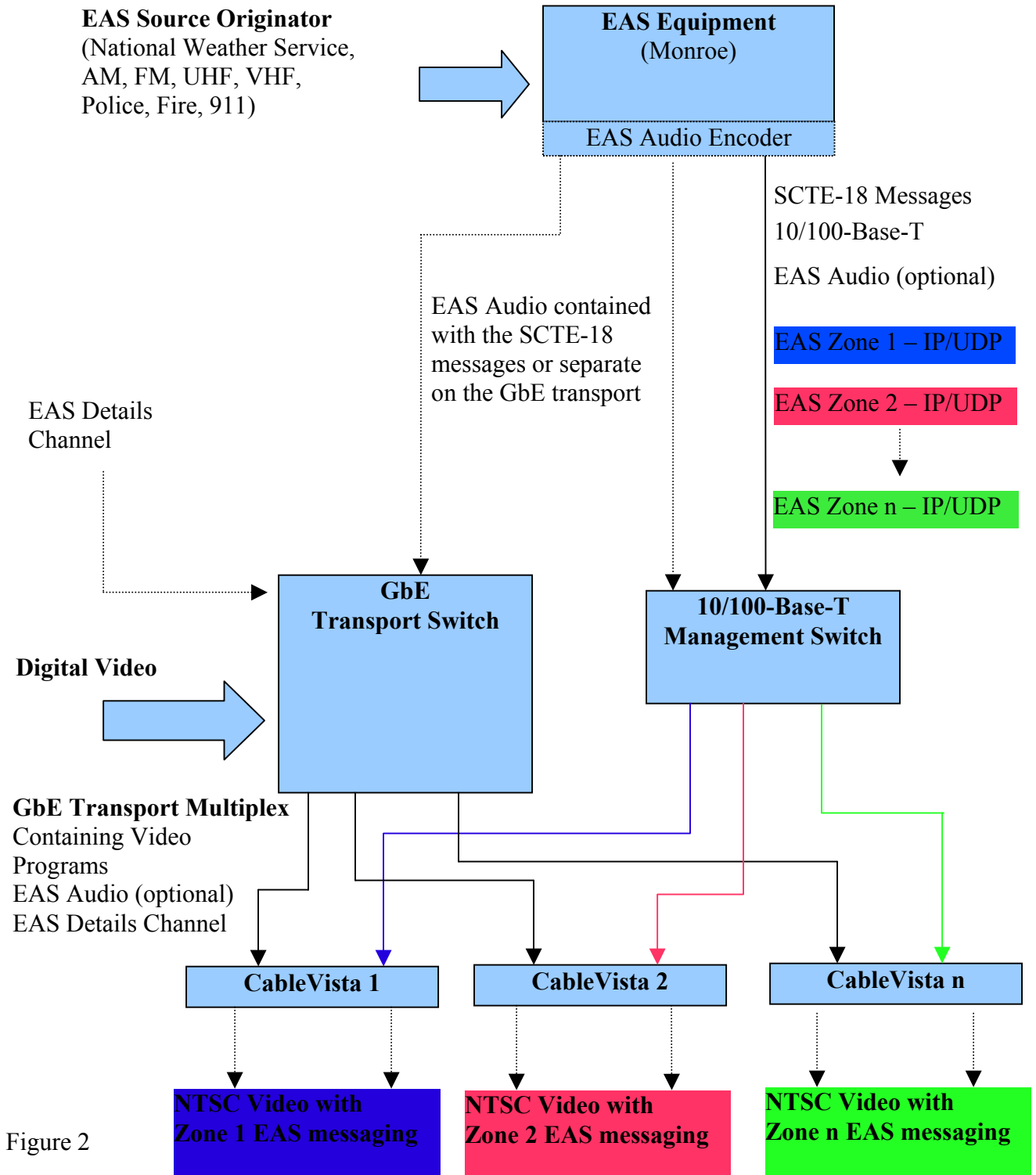


Figure 2

12.0 Configuring the CableVista for EAS

1. To Enable and setup out-of-band EAS:

From the CableVista web interface menu, select

CV Home

-> Network Interfaces

-> Fast Ethernet 0/1 Settings

VCom Inc. - CableVista - Fast Ethernet Interface 0/1 Settings - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://192.168.154.77/cgi/fe_settings.cgi

Getting Started Latest Headlines

CableVista VCom Inc.

CV Home

- Network Interfaces
 - Summary
 - Gigabit Ethernet Settings
 - Gigabit Ethernet 0/1 Status
 - Gigabit Ethernet 0/2 Status
 - Fast Ethernet 0/1 Settings
 - Fast Ethernet 0/1 Status
 - IGMP Memberships
 - SNMP
- Input Settings
- Output Ports
- System

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Fast Ethernet Interface 0/1 Settings

Network Settings for FE 0/1

IP Assignment Method	☒ DHCP ☐ Static
IP Address	192.168.154.77
Netmask	255.255.254.0
MAC Address	00:50:c2:06:c3:ac
Default Gateway	192.168.154.1
Domain Search Suffix and DNS Servers	search corp.vcom.com nameserver 192.168.147.10 nameserver 192.168.147.41 nameserver 192.168.154.1
SCTE-18 Enabled	☒
SCTE-18 Multicast Group IP Address	224.9.9.9
SCTE-18 UDP Port	345

Submit

Done

SCTE-18 Enabled

Enables/Disables SCTE-18 processing on Fast Ethernet Interface 0/1.

SCTE-18 Multicast Group IP Address

If the SCTE-18 equipment is configured to use IGMPv2 multicast, then the multicast group to receive SCTE-18 messages from is configured here. If the SCTE-18 messages are sent unicast, then this field will be configured blank.

SCTE-18 UDP Port

Configures the system to listen for SCTE-18 messages on the given UDP port.

2. To enable Individual Channels:

From the CableVista web interface menu, select

CV Home

-> Output Ports

-> Slot X/Port Y.Channel Z for the desired output channel

The screenshot shows the CableVista web interface in a Mozilla Firefox browser window. The address bar displays the URL: `http://192.168.154.188/cgi/output_slot_port.cgi?slot=1&port=1&channel=1`. The page title is "CV1120BB #1/1.1 Status Summary".

On the left, a navigation tree under "CV Home" includes "Output Ports" > "Slot 1/Port 1.Channel 1".

The main content area is titled "CV1120BB #1/1.1 Status Summary" and contains two sections:

- Status:** A table with three rows: Main (0), Video (0), and Audio (0). A "Details" link is below it.
- Channel Output Configuration:** A table with various settings, including "System SCTE-18 Support" which has "Out Of Band" and "In Band" checkboxes both checked. This section is circled in the image.

At the bottom of the configuration table are buttons for "Submit", "Reset Tuning Parameters", and "Reboot Card".

System SCTE-18 Support:

Out Of Band

If this check box is selected, then the output card is configured to

process & display SCTE-18 messages received on Fast Ethernet Interface 0/1.

In Band

If this check box is selected, then the output card is configured to process & display SCTE-18 messages received in the input transport stream configured to this output.