

Avitech ASCII Z Commands

(Sequoia 2H2U/4H; Pacific C-HSS/C-SHS/C-A/C-AG; Rainier Essentials; Titan 8000)

ABOUT THIS REFERENCE GUIDE

This reference guide contains information about how to use the Avitech ASCII Protocol (AAP) of Pacific C-HSS/C-SHS/C-A/C-AG and Sequoia 2H2U/4H. Also included are supports of some older Avitech multiviewer models.

The following conventions are used to distinguish elements of text throughout the reference guide.



Provides additional hints or information that requires special attention.



Identifies warnings which must be strictly followed.

Any name of a menu, command, icon or button on the screen is shown in a bold typeset. For example: On the **Start** menu select **Settings**.

To assist us in making improvements to this reference guide, we welcome any comments and constructive criticism. Please send all such – in writing to: sales@avitechvideo.com.

WARNING

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1. ASCII Z Command

Pacific C-HSS/C-SHS/C-A/C-AG and Sequoia 2H2U/4H support the ASCII Z command prompt interface through Ethernet port (IP).

Titan 8000 and Rainier 4U/4U1V support the ASCII Z command prompt interface through serial port (RS-232) and Ethernet port (IP).

This chapter discusses using the Avitech ASCII Protocol (AAP) of Pacific C-HSS/C-SHS/C-A/C-AG and Sequoia 2H2U/4H, as well as Titan 8000 and Rainier 4U/4U1V.

1.1 ASCII Z Command Format

The ASCII Z command is comprised of the following parts:

Header	Group/Module/Window Assignment	Parameter 1	Parameter 2	...
--------	--------------------------------	-------------	-------------	-----

Figure 1-1 Parts of ASCII Z Command

The following is a list of rules to follow when entering the ASCII Z command:

- ❖ *It is acceptable to enter a command in both lowercase and uppercase letters; a space is required between any parts of a command*
- ❖ **Header = Z + command character**
- ❖ **Group/Module/Window assignment (GGMMPP)**
 - ✓ **Group** is comprised of the first two digits (01-99). "00" is used to pertain to all group assignments.
 - ✓ **Module** is comprised of the middle two digits (01-15). "00" is used to pertain to all module assignments.
 - ✓ **Window** is comprised of the last two digits (01–08), "00" is used to pertain to all window assignments.



1. For the Pacific C-HSS/C-SHS/C-A/C-AG, the GGMMPP assignment is fixed at "000000" as the device only supports one signal in and out.
2. For the Sequoia 2H2U/4H, the GGMM assignment is fixed at "0000" as the device has no group or module designation.
3. For the Titan 8000/Rainier Essentials, each of their Z command is comprised of six Arabic numerals and used in designating the device's Group/Module/Window assignment.

- ❖ **Parameter** is for advance setting of each Z command

1.2 Entering the ASCII Z Command Interface

1.2.1 Using the ASCII Test Utility

The proprietary Avitech ASCII Test utility can simplify the creation of BIN file, load previously saved BIN file, as well as generating three types of text files (for third-party programs).

To use the ASCII Test utility, perform the following steps:

Step 1. Double-click the “ASCII_Test.exe” file.

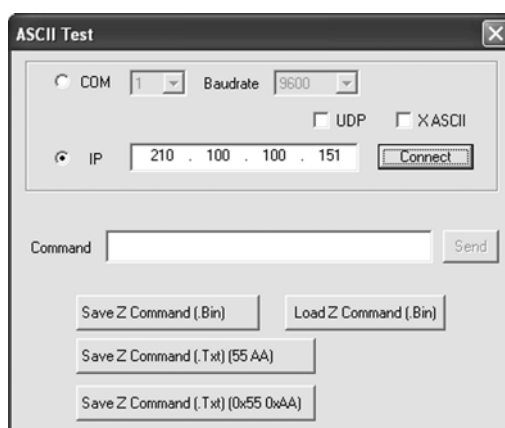


Figure 1-2 ASCII Test Utility

*Step 2. For Sequoia 2H2U/4H only – Select **UDP** (User Datagram Protocol) or **TCP/IP** (Transmission Control Protocol – default).*



PC's software can communicate via Ethernet with control board's firmware. During PC software communication with control board firmware via TCP or UDP, control board firmware functions as TCP or UDP server while PC software functions as TCP or UDP client. The TCP port number is fixed at 20036. The UDP port number is fixed at 20037.

TCP is a connection-oriented protocol, which means that it requires handshaking to set up end-to-end communications. Once a connection is set up user data may be sent bi-directionally over the connection.

✓ **Reliable** – TCP manages message acknowledgment, retransmission and timeout. Multiple attempts to deliver the message are made. If it gets lost along the way, the server will re-request the lost part. In TCP, there's either no missing data, or, in case of multiple timeouts, the connection is dropped.

✓ **Ordered** – if 2 messages are sent over a connection in sequence, the first message will reach the receiving application first. When data segments arrive in the wrong order, TCP buffers delay the out-of-order data until all data can be properly re-ordered and delivered to the application.

✓ **Heavyweight** – TCP requires 3 packets to set up a socket connection, before any user data can be sent. TCP handles reliability and congestion control.

✓ **Streaming** – Data is read as a byte stream, no distinguishing indications are transmitted to signal message (segment) boundaries.

UDP is a simpler message-based connectionless protocol. Connectionless protocols do not set up a dedicated end-to-end connection. Communication is achieved by transmitting information in one direction from source to destination without verifying the readiness or state of the receiver. However, one primary benefit of UDP over TCP is the application to voice over internet protocol (VoIP) where latency and jitter are the primary concerns. It is assumed in VoIP UDP that the end users provide any necessary real time confirmation that the message has been received.

✓ **Unreliable** – When a message is sent, it cannot be known if it will reach its destination; it could get lost along the way. There is no concept of acknowledgment, retransmission, or timeout.

✓ **Not ordered** – If 2 messages are sent to same recipient, the order of arrival cannot be predicted.

✓ **Lightweight** – There is no ordering of messages, no tracking connections, etc. It is a small transport layer designed on top of IP.

✓ **Datagrams** – Packets are sent individually and are checked for integrity only if they arrive. Packets have definite boundaries which are honored upon receipt, meaning a read operation at the receiver socket

will yield an entire message as it was originally sent.


✓ No congestion control – UDP itself does not avoid congestion, and it's possible for high bandwidth applications to trigger congestion collapse, unless they implement congestion control measures at the application level.

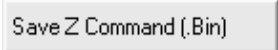
Step 3. Enter the correct **IP** address assigned to the Avitech device.


Step 4. Click **Connect**.

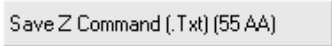
Step 5. Type **ZA 000000** (automatically arrange all windows to optimum size and position) in **Command** window.

Step 6. Click **Send**.

 Performing the following action allows user to save and load often-used Z commands for later use:

* Click  to generate and save the **ZA 000000.bin** file for re-use or use with third-party utility.

* Click  to load a previously saved Bin file. The **ZA 000000** command will automatically appear in the **Command** window. Then click **Send**.

* Click  to generate the sample (first type) binary text string (text file) as shown below for use with a third-party utility.

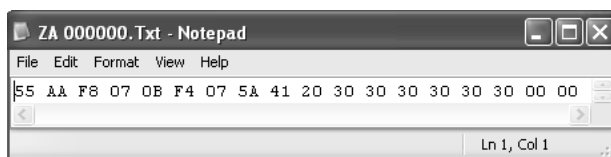
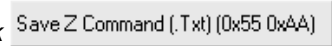


Figure 1-3 Sample Binary Text String – (First Type)

* Click  to generate the sample (second type) binary text string (text file) as shown below for use with a third-party utility.

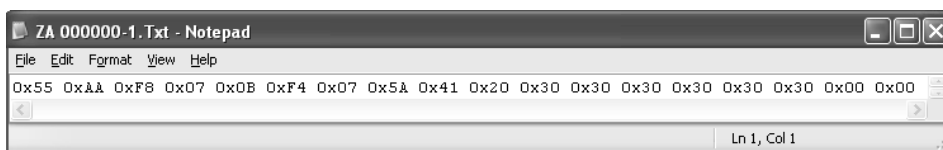
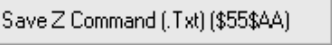


Figure 1-4 Sample Binary Text String – (Second Type)

* Click  to generate the sample (third type) binary text string (text file) as shown below for use with a third-party utility.

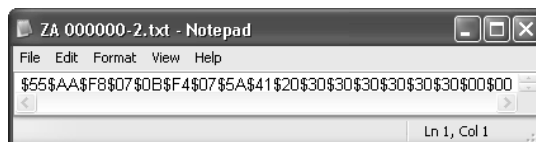


Figure 1-5 Sample Binary Text String – (Third Type)

1.2.2 Creating BIN File for Third-Party Application

To create a BIN file for a third-party program other than the proprietary Avitech ASCII Test utility, perform the following steps:

Step 1. Install a binary file editing program in the computer
(example: HexEdit, <http://www.hexedit.com>).

Step 2. Run the binary file editing program and use the following command syntax to create and save the sample binary file.

Example 1:

Execute "ZA 000000" = arranges all windows to its proper size and position.
0x55 0xAA 0x08 0xF7 0x0B 0xF4 0x07 "ZA 000000" 0x00



The double-quote "" of sample string "ZA 000000" is for string expression; there are no quote characters (0x22) in the command contents (actual memory dump of command).

The command is composed of the following parts–

```

0x55 0xAA           //command head
0x08 0xF7           //command ID
0x0B = (A) + (B) = 11 bytes //command length
0xF4 = 0xff - [(A) + (B)]
0x07 = 1 byte (A)
ZA 000000 = 0x5A 0x41 0x20 0x30 0x30 0x30 0x30 0x30 0x30 0x30 0x00(end of string)
              = 10 bytes (B) //Avitech ASCII Z command
0x00               //command tail
  
```

Example 2:

Execute "ZA 000000 2 1" = arranges all windows to a 2x2 map, position 1
0x55 0xAA 0x08 0xF7 0x0F 0xF0 0x07 "ZA 000000 2 1" 0x00



The double-quote "" of sample string "ZA 000000 2 1" is for string expression; there are no quote characters (0x22) in the command contents (actual memory dump of command).

The command is composed of the following parts–

```

0x55 0xAA           //command head
0x08 0xF7           //command ID
0x0F = (A) + (B) = 15 bytes //command length
0xF0 = 0xff - [(A) + (B)]
0x07 = 1 byte (A)
ZA 000000 2 1 = 0x5A 0x41 0x20 0x30 0x30 0x30 0x30 0x30 0x30 0x30 0x20 0x32 0x20
                  0x31 0x00(end of string)
                  = 14 bytes (B) //Avitech ASCII Z command
0x00               //command tail
  
```


1.2.3 Release the Ethernet Connection from Avitech Device

In the case where the third-party program that is currently connected (through Ethernet) to the Avitech device needs to be disconnected (e.g., to be able to use the Phoenix-G program to connect to the Avitech device), use the below binary text string:

Execute "exit" to release the Ethernet connection from Avitech device.
0x55 0xAA 0x08 0xF7 0x06 0xF9 0x07 "exit" 0x00



The double-quote "" of sample string "exit" is for string expression; there are no quote characters (0x22) in the command contents (actual memory dump of command).

The command is composed of the following parts—

0x55 0xAA	//command head
0x08 0xF7	//command ID
0x06 = (A) + (B) = 6 bytes	//command length
0xF9 = 0xff - [(A) + (B)]	
0x07 = 1 byte (A)	
exit = 0x65 0x78 0x69 0x74 0x00(end of string)	
= 5 bytes (B)	//Avitech ASCII Z command
0x00	//command tail

1.3 ASCII Z Command Summary

The followings are lists of ASCII Z commands for each supported Avitech device.

1.3.1 Sequoia 2H2U/4H

ZA	
Function	Set to automatically arrange window layout.
Format	ZA GGMMPP [NByN(2,3,.....)] [Nth(1,2,.....)]
Example	ZA 00000 2 1 Place all windows to a 2x2 map, position 1, 2, 3, and 4 (quad-split).
	ZA 00002 3 2 Place window 2 to a 3x3 map, position 2.
	ZA 00000 6 13 Place all windows to a 6x6 map, position 13, 14, 15, and 16.
	ZA 000000 Automatically arrange all windows to the optimum size and position.

Table 1-1 ZA Command

ZB	
Function	Set the border width of a window(s).
Format	ZB GGMMPP width
Example	ZB 00000 2 Set the border width of all windows as 2 pixels.
	ZB 00002 4 Set the border width of window 2 as 4 pixels.

Table 1-2 ZB Command

ZC	
Function	Set the border color (with/without dimming effect) and the label's background color of a window. <i>[NoDimColor] (ndc) signifies removal of the border's dimming effect.</i>
Format	ZC GGMMPP B [order]/L[abel] RRRGGGBBB NoDimColor
Example	ZC 00001 B 000255000 set the border color of window 1 as dim green.
	ZC 00002 B 255000000 ndc set the border color of window 2 as pure red.
	ZC 00003 L 00000255 set the label's background color of window 3 as dim blue.

Table 1-3 ZC Command

ZF	
Function	Turn on/off a video window's full screen mode (choice of setting the window as background).
Format	ZF GGMMPP [full screen mode 1 (on) / 0 (off)] [background 1 (on) / 0 (off)]
Example	ZF 00004 1 set window 4 to full screen.
	ZF 00004 0 disable full screen mode for window 4 and revert it back to its former display size.
	ZF 00003 1 1 set window 3 to full screen and set it as background.

Table 1-4 ZF Command

ZH	
Function	Display device information.
Format	ZH GGMMPP
Example	ZH 000000 display device information (IP address, module name, output mode, and BIOS version).

Table 1-5 ZH Command

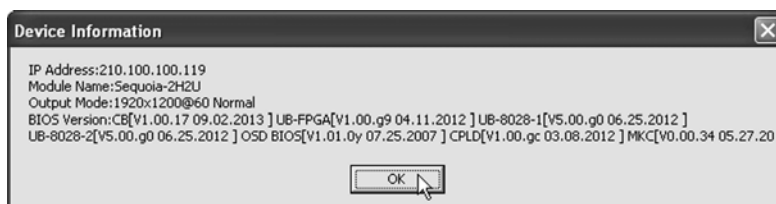


Figure 1-6 Device Information

ZL	
Function	Set label transparency, text color, label color, and text string.
Format	ZL GGMMPP 0 (transparency) 00000000 (text color RRRGGGBBB) 00000000 (label color RRRGGGBBB) "TEXT"
	Label text is always center-aligned; text string contains 32 ASCII characters maximum and will be dependent on the font size. For example, upon entering label text "0123456789" with font size 3, Sequoia 2H2U/4H will only display "012345678" on the corresponding window. Please note that even though Sequoia 2H2U/4H does not support transparent label, it is necessary to include this parameter in the command.
Example	ZL GGMMPP 0 255000000 000000255 "CNN News Station" set GGMMPP's text color as red, label color as blue, with text string "CNN News Station".

Table 1-6 ZL Command

ZM

Change the output resolution. The resolution number corresponds to the list of resolutions/frequency Avitech device supports.

Function	Resolution	Vertical Frequency			
		50 Hz	59.94 Hz	60 Hz	75 Hz
	640 × 480	N/A	N/A	69	N/A
	800 × 600	42	N/A	1	47
	1024 × 768	31	N/A	2	11
	1280 × 720	30	68	15	48
	1280 × 768	32	N/A	22	49
	1280 × 1024	29	N/A	9	12
	1360 × 768	38	N/A	20	21
	1400 × 1050	34	N/A	35	50
	1440 × 900	46	N/A	45	51
	1600 × 1200	39	N/A	10	52
	1680 × 1050	41	N/A	40	53
	1920 × 1080	28	N/A	26	N/A
	1920 × 1200	37	N/A	36	N/A

Format **ZM GGMMPP ##** (resolution number) **NoAuto** arrangement

Example
ZM 000000 10
 set to display at 1600×1200/60Hz, and automatically arrange all windows to the optimum size and position.
ZM 000000 9 NA
 set to display at 1280×1024/60Hz without automatic window arrangement.

Table 1-7 ZM Command

ZN

Function Turn on/off the OSD/border/label/tally/window/background/audio meter (Sequoia 2H2U only)/remove black bar/lock window priority.
 Turn on/off aspect ratio auto detection/display following aspect ratio.

Format **ZN GGMMPP** option (O[SD]/B[order]/L[abel]/T[ally] /B[ack]G[round] /W[indow]/M[eter]/R[emove]B[lack bar] /W[indow]P[riority]) **1** (on)/**0** (off)
ZN GGMMPP A[spect]R[atio]D[etection]/D[isplay]F[ollow]A[spect]R[atio] **1** (auto detect)/**0** (custom)

Example
ZN 000000 O 0
 turn off the OSD (On-Screen-Display) of all windows.
ZN 000001 O 1
 turn on the OSD of window 1.
ZN 000002 B 0
 turn off the border of window 2.
ZN 000003 L 1
 turn on the label of window 3.
ZN 000000 W 0
 turn off all windows.
ZN 000004 T 0
 turn off the tally of window 4.
ZN 000000 BG 1
 turn on the background.

ZN
ZN 00001 RB 1

turn on automatic black bar removal for window 1.

ZN 00001 M 1 (only applicable for Sequoia 2H2U)

turn on the audio meter of window 1.

ZN 00000 WP 1

turn on lock window priority for all windows.

ZN 00000 ARD 1

auto detect aspect ratios of all input sources.

ZN 00000 DFAR 1

auto detect aspect ratios of all input sources and display following the aspect ratios.

Table 1-8 ZN Command

ZO

Function	Set the audio output. Volume control is not available for audio signal from the HDMI OUT port of the Sequoia device to the monitor's speakers. Due to video/image processing delays, one could achieve audio/video sync by adjusting audio delay.
Format	ZO GGMMPP [1 (on) / 0 (off)] [In 0 (analog) / 1 (digital) / Out 0 (analog) / 1 (digital)] [volume 0–9 where 0 is mute] [delay 0–9 where 0 is no delay]
Example	<p>ZO 00001 1 turn on the audio of window 1.</p> <p>ZO 00002 1 1 1 5 9 turn on the audio of window 2 (digital input signal, digital output signal, volume set at level 5, and audio delay set at level 9).</p> <p>ZO 00002 0 turn off the audio of window 2.</p>

Table 1-9 ZO Command

ZP

Function	Load a previously saved preset/background file or save the current layout to a preset. If the filename includes a space(s), use double quotation marks to signify the complete filename.
Format	ZP GGMMPP L[oad] / S[ave] "filename.GP#" / "filename.bmp"
Example	<p>ZP 00000 L "File 1.GP1" set all windows to load the previously saved "File 1.GP1" preset file.</p> <p>ZP 00000 S "File 2.GP1" save the current layout of all windows to a preset file "File 2.GP1".</p> <p>ZP 00000 L "File 1.bmp" set the module to load the "File 1.bmp" background file.</p>

Table 1-10 ZP Command

ZR	
Function	Lock and adjust the aspect ratio of SD and HD input source.
Format	ZR GGMMPP SD [width ratio] [height ratio] HD [width ratio] [height ratio] (for Sequoia 2H2U)
Example	<p>ZR GGMMPP HD [width ratio] [height ratio] (for Sequoia 4H)</p> <p>ZR 000001 4 3 16 9 (for Sequoia 2H2U) set window 1's SD aspect ratio as 4:3, HD aspect ratio as 16:9.</p> <p>ZR 000001 4 3 (for Sequoia 4H) set window 1's aspect ratio as 4:3.</p> <p>ZR 000000 16 9 4 3 (for Sequoia 2H2U) set all windows' SD aspect ratio as 16:9, HD aspect ratio as 4:3.</p> <p>ZR 000000 16 9 (for Sequoia 4H) set all windows' aspect ratio as 16:9.</p> <p>ZR GGMMPP 7 12 7 12 (for Sequoia 2H2U) set GGMMPP's SD and HD aspect ratio as 7:12.</p> <p>ZR GGMMPP 7 12 (for Sequoia 4H) set GGMMPP's aspect ratio as 7:12.</p> <p>ZR GGMMPP 0 0 0 0 disable the function by setting the width ratio or height ratio as 0.</p>

Table 1-11 ZR Command

ZS	
Function	Display information of an input source(s).
Format	ZS GGMMPP
Example	ZS 000000 display information (signal type, horizontal/vertical frequency, and total/start timing flag) of all sources.

Table 1-12 ZS Command

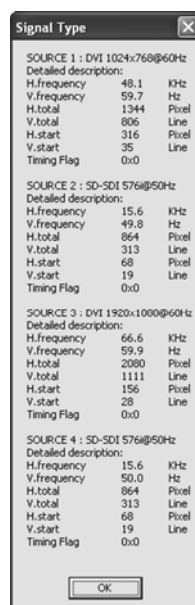


Figure 1-7 Signal Type Information

ZW	
Function	<p>Get position and size information of all windows.</p> <p>Set the position and size of a window; set window priority for overlapped windows (set the topmost window); or crop a window. When cropping, the width and height are calculated based on the output resolution. For example, if the output resolution is 1280×1024 at 60Hz, to display the bottom-right quarter of the input image:</p> <p>Crop X = 1280 / 2 = 640 (crop width = 1280 / 2 = 640) Crop Y = 1024 / 2 = 512 (crop height = 1024 / 2 = 512)</p> <p>There is no need to take the input image size/position or the window size into account. The cropping function always presumes that the input image size is equal to the output resolution.</p>
Format	<p>ZW GGMMPP</p> <p>ZW GGMMPP X position Y position W(idth) H(eight)</p> <p>ZW GGMMPP C[rop] 1 (on) / 0 (off) X position Y position W(idth) H(eight)</p> <p>ZW GGMMPP P[priority] source window 1 2 3 4 (order based on priority; must include "space" between numbers)</p>
Example	<p>ZW 000000 get the position and size information of all windows.</p> <p>ZW 000001 set window 1 as the topmost window.</p> <p>ZW 000001 100 200 300 400 set window 1 at (100, 200) top-left position with (300, 400) width and height respectively.</p> <p>ZW 000001 0 0 0 0 turn off window 1 by setting its width or height as 0.</p> <p>ZW 000002 C 1 100 100 320 240 crop window 2 at (100, 100) top-left position with (320, 240) width and height respectively.</p> <p>ZW 000004 C 0 disable the cropping function of window 4.</p> <p>ZW 000000 P 4 3 2 1 set window 4 to be the topmost window, followed by window 3, window 2, and window 1(overlapped).</p> <p>ZW 000000 P 2 3 4 1 set window 2 to be the topmost window, followed by window 3, window 4, and window 1 (overlapped).</p>

Table 1-13 ZW Command

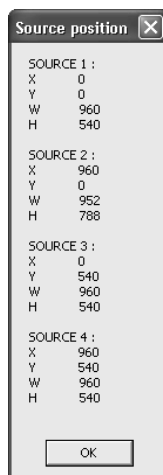


Figure 1-8 Source (Window) position/Window size information

ZX	
Function	<p>Change the label text and font size of a window(s). Include quotation marks when entering the label text string (32 characters maximum; center-aligned). The width of the label's background is fixed (following the width of the window).</p> <p>When entering Swedish other than the 26-letter English on a non-Swedish keyboard, enter the label text by typing (Alt+196) (Alt+197) (Alt+214) (Alt+228) (Alt+229) (Alt+246).</p> <p><i>Note:</i></p> <ol style="list-style-type: none"> 1. Modern Swedish is written with a 29-letter alphabet consisting of the modern 26-letter Latin alphabet plus 3 other letters: å, ä and ö. 2. The Swedish characters will not appear on the Phoenix-G utility "Control" window's label but will appear on the output display.
Format	<p>ZX GGMPP "label text" (supports ASCII characters only – include the quotation marks or Swedish) # (font size 1 to 4)</p>
Example	<p>ZX 00000 "Input 1" Input 1 will appear as the label on all windows.</p> <p>ZX 00000 3 set the label font size to 3.</p> <p>ZX 00004 "<type Alt+196 Alt+197 Alt+214 Alt+228 Alt+229 Alt+246>" ÄÅÖääö will appear as the label on window 4.</p>

Table 1-14 ZX Command

Upper case letters																												
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Å	Ä	Ö
Lower case letter																												
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	å	ä	ö

Figure 1-9 Swedish Alphabet

															ÿ
															00EF
															191
À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF
192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF
208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF
224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ
00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF
240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Figure 1-10 “ISO 8859-1” (Decimal System) Character Text (Alt+191 to Alt+255)

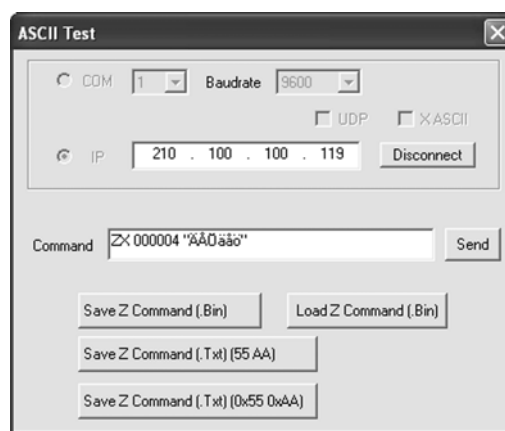


Figure 1-11 Sample ZX Swedish Label Text (Type ZX 00004 “Alt+196 Alt+197 Alt+214 Alt+228 Alt+229 Alt+246”)

1.3.2 Pacific C-HSS

ZB																
Function	Turn on/off PiP (Picture-in-Picture) and select the input source for the PiP window.															
Format	<p>ZB GGMMPP [PiP window 1 (on) / 0 (off) source X position Y position W(idth) H(eight)]</p> <ul style="list-style-type: none"> ❖ The source values are assigned as follows: <ul style="list-style-type: none"> 2 = HDMI 3 = DVI 4 = VGA 5 = YPbPr 6 = SDI <p>The values of W(idth) and H(eight) must be greater than 20% of the input signal resolution width and height.</p> <p>For example, if the module's input signal resolution is 1280×1024 @ 60Hz, then the width is 1280 and the height is 1024. The cropped window size must be greater than 256 (20% of 1280) × 204 (20% of 1024).</p> <p><i>Note:</i></p> <ol style="list-style-type: none"> 1. When DVI is selected as the input source for the Main window, HDMI cannot be assigned to the PiP window. 2. When HDMI is selected as the input source for the Main window, DVI cannot be assigned to the PiP window. 3. Window size is limited by the output resolution as follows: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Output resolution</th> <th>Max. Width</th> <th>Max. Height</th> </tr> </thead> <tbody> <tr> <td>1080p</td> <td>1920</td> <td>1080</td> </tr> <tr> <td>720p</td> <td>1280</td> <td>720</td> </tr> <tr> <td>SD_525</td> <td>720</td> <td>487</td> </tr> <tr> <td>SD_625</td> <td>720</td> <td>576</td> </tr> </tbody> </table>	Output resolution	Max. Width	Max. Height	1080p	1920	1080	720p	1280	720	SD_525	720	487	SD_625	720	576
Output resolution	Max. Width	Max. Height														
1080p	1920	1080														
720p	1280	720														
SD_525	720	487														
SD_625	720	576														
Example	<p>ZB 000000 0 turn off PiP.</p> <p>ZB 000000 1 turn on PiP.</p> <p>ZB 000000 1 2 turn on PiP and set HDMI as the input.</p> <p>ZB 000000 0 2 turn off PiP and set HDMI as the input.</p> <p>ZB 000000 1 6 50 100 1000 1000 turn on PiP and set SDI as the input; position the PiP window at (50, 100) with window width and height = (1000, 1000) respectively.</p> <p>ZB 000000 1 6 0 0 960 540 turn on PiP and set SDI as its input source; position the PiP window at (0, 0) with window width and height = (960, 540) respectively.</p>															

Table 1-15 ZB Command

ZG	
Function	The genlock feature allows frame synchronization of video sources (DVI-I IN , SDI/CVBS IN , and HDMI IN ports' signals synchronized to the REF IN signal).
Format	<p>ZG GGMMPP L(ock) [1 (on) / 0 (off)] [timing type] [delay lines]</p> <ul style="list-style-type: none"> ❖ Timing Type <ul style="list-style-type: none"> ✓ SD 20 (SD_525) / 21 (SD_625) ✓ 720p 1 (30Hz) / 2 (29.97Hz) / 3 (25Hz) / 4 (24Hz) / 5 (23.98Hz) / 8 (60Hz) / 22 (59.94Hz) / 23 (50Hz) ✓ 1080i 11 (60Hz) / 18 (50Hz) / 30 (59.94Hz) ✓ 1080PsF 6 (24Hz) / 7 (23.98Hz) ✓ 1080p 17 (60Hz) / 19 (50Hz) / 24 (59.94Hz) / 25 (30Hz) / 26 (29.97Hz) / 27 (25Hz) / 28 (24Hz) / 29 (23.98Hz) ❖ Delay Lines <ul style="list-style-type: none"> Must not exceed the output resolution's "V-total": ✓ For SD 525 signal up to 524 delay lines ✓ For SD 625 signal up to 624 delay lines ✓ For 720p signal up to 749 delay lines ✓ For 1080p/1080i/2048x1080p signal up to 1124 delay lines
Example	<p>ZG 000000 L 0 turn off genlock.</p> <p>ZG 000000 L 1 11 120 turn on genlock; set the output signal at 1080i/60Hz with 120 delay lines.</p>

Table 1-16 ZG Command

ZI	
Function	Select the input source for the Main window.
Format	<p>ZI GGMMPP source</p> <ul style="list-style-type: none"> ❖ The input source values are assigned as follows: <ul style="list-style-type: none"> 1 = automatic scan 2 = HDMI 3 = DVI 4 = VGA 5 = YPbPr 6 = SDI
Example	<p>ZI 000000 1 set to automatically scan the input source.</p> <p>ZI 000000 2 set HDMI as the input source.</p>

Table 1-17 ZI Command

ZJ	
Function	Automatically adjust the analog VGA signal entering the Input port. I [image] will automatically perform image alignment adjustment. G [ain] will automatically adjust image gain.
Format	ZJ GGMMPP I [image] / G [ain]
Example	<p>ZJ 00000 I automatically perform image alignment adjustment.</p> <p>ZJ 00000 G automatically adjust image gain.</p>

Table 1-18 ZJ Command

ZM																																																		
Function	Change the output resolution. The resolution number corresponds to the list of resolutions/vertical frequency that Avitech device supports (as well as enabling/disabling SDI output).																																																	
Function	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Vertical Frequency</th> <th colspan="4">Resolution</th> </tr> <tr> <th>720p</th> <th>1080i</th> <th>1080p</th> <th>1080PsF</th> </tr> </thead> <tbody> <tr><td>23.98 Hz</td><td>5</td><td>N/A</td><td>29</td><td>7</td></tr> <tr><td>24 Hz</td><td>4</td><td>N/A</td><td>28</td><td>6</td></tr> <tr><td>25 Hz</td><td>3</td><td>N/A</td><td>27</td><td>N/A</td></tr> <tr><td>29.97 Hz</td><td>2</td><td>N/A</td><td>26</td><td>N/A</td></tr> <tr><td>30 Hz</td><td>1</td><td>N/A</td><td>25</td><td>N/A</td></tr> <tr><td>50 Hz</td><td>23</td><td>18</td><td>19</td><td>N/A</td></tr> <tr><td>59.94 Hz</td><td>22</td><td>30</td><td>24</td><td>N/A</td></tr> <tr><td>60 Hz</td><td>8</td><td>11</td><td>17</td><td>N/A</td></tr> </tbody> </table> <p>SD_525 = 20 SD_625 = 21</p>	Vertical Frequency	Resolution				720p	1080i	1080p	1080PsF	23.98 Hz	5	N/A	29	7	24 Hz	4	N/A	28	6	25 Hz	3	N/A	27	N/A	29.97 Hz	2	N/A	26	N/A	30 Hz	1	N/A	25	N/A	50 Hz	23	18	19	N/A	59.94 Hz	22	30	24	N/A	60 Hz	8	11	17	N/A
Vertical Frequency	Resolution																																																	
	720p	1080i	1080p	1080PsF																																														
23.98 Hz	5	N/A	29	7																																														
24 Hz	4	N/A	28	6																																														
25 Hz	3	N/A	27	N/A																																														
29.97 Hz	2	N/A	26	N/A																																														
30 Hz	1	N/A	25	N/A																																														
50 Hz	23	18	19	N/A																																														
59.94 Hz	22	30	24	N/A																																														
60 Hz	8	11	17	N/A																																														
Format	ZM GGMMPP [1 (on) / 0 (off)] ##(resolution number)																																																	
Example	<p>ZM 00000 8 Set to display at 720p/60Hz.</p> <p>ZM 00000 1 8 Set to display at 720p/60Hz with SDI output enabled.</p> <p>ZM 00000 0 8 Set to display at 720p/60Hz with SDI output disabled.</p>																																																	

Table 1-19 ZM Command

ZN	
Function	Turn on/off the color bar and set the pattern.
Format	ZN GGMMPP C [olor bar] 1 (on) / 0 (off) [pattern 0 (color bar) / 1 (2×2 crosshatch)]
Example	<p>ZN 00000 C 0 turn off the color bar.</p> <p>ZN 00000 C 1 1 turn on the color bar and select the 2×2 crosshatch pattern.</p>
	<i>Note: The color bar can only be turned on/off when there is no input signal.</i>

Table 1-20 ZN Command

ZO	
Function	Set the audio output. Due to video/image processing delays, one could achieve audio/video sync by adjusting audio delay.
Format	ZO GGMMPP [1 (on) / 0 (off)] [input type 1 (analog) / 2 (digital/SDI) / 3 (digital/HDMI)] [audio delay 1 to 170 millisecond; 0 is no audio delay]
Example	<p>ZO 000000 0 turn off audio.</p> <p>ZO 000000 1 turn on audio-</p> <p>ZO 000000 1 2 170 turn on audio; set audio source to SDI and maximize delay time.</p>

Table 1-21 ZO Command

ZP	
Function	Load a previously saved preset or save the current layout to a preset. If the filename includes a space(s), use double quotation marks to signify the complete filename.
Format	ZP GGMMPP L[oad] / S[ave] "filename.GP#"
Example	<p>ZP 000000 load "Stage 1.GP1" set all modules to load the previously saved preset file "Stage 1.GP1".</p> <p>ZP 000000 s "file2.GP1" save the current layout to preset file "File 2.GP1".</p>

Table 1-22 ZP Command

ZR	
Function	Lock and adjust the aspect ratio. If the width is greater than the height, the value of width ratio must not exceed 6 times the value of height ratio (6:1 ratio). Similarly, if the height is greater than the width, the value of height ratio must not exceed 6 times the value of width ratio (1:6 ratio).
Format	ZR GGMMPP [1 to 20 width ratio] [1 to 20 height ratio]
Example	<p>ZR 000000 4 3 set windows' aspect ratio as 4:3.</p> <p>ZR 000000 16 9 set windows' aspect ratio as 16:9.</p> <p>ZR 000000 7 12 set windows' aspect ratio as 7:12.</p> <p>ZR 000000 0 0 disable the function by setting the width or height ratio as 0.</p>

Table 1-23 ZR Command

ZS	
	Set the video source's sampling structure and bit depth.
Function	<i>Note: Map structure is not supported in the case where output resolution is at SD_525, SD_625, 1080p 50Hz/59.94Hz/60Hz.</i>
Format	ZS GGMMPP S (structure) [0 (YCbCr 4:2:2) / 1 (YCbCr 4:4:4) / 2 (RGB 4:4:4)]
Example	<p>ZS 000000 S 0 set all windows to YCbCr 4:2:2 sampling structure.</p> <p>ZS 000000 S 1 set all windows to YCbCr 4:4:4 sampling structure.</p>

Table 1-24 ZS Command

ZW	
	Set window position and size, or crop a window. For cropping, the X/Y position, width, and height are calculated based on the input signal resolution.
Function 1	<p>The value of W(idth) and H(eight) must be greater than 20% of the input signal resolution width and height.</p> <p>For example, if the module's input signal resolution is 1280×1024 @ 60Hz, then the width is 1280 and the height is 1024. The cropped window size must be greater than 256 (20% of 1280) × 204 (20% of 1024).</p>
Format	ZW GGMMPP C [rop] 1 (on) / 0 (off) X position Y position W (idth) H (eight) panel width panel height
Example	<p>ZW 000000 C 1 0 0 320 240 1280 1024 crop from (0, 0) top-left position, 320×240 window size, 1280×1024 input signal resolution.</p> <p>ZW 000000 C 0 disable the cropping function.</p>
	Set the keying parameter. When cropping with keying, the X/Y position, width, and height are calculated based on the module's input signal resolution.
Function 2	<p>The value of W(idth) and H(eight) must be greater than 20% of the input signal resolution width and height.</p> <p>For example, if the module's input signal resolution is 1280×1024 @ 60Hz, then the width is 1280 and the height is 1024. The cropped window size must be greater than 256 (20% of 1280) × 204 (20% of 1024).</p>
Format	ZW GGMMPP K [eying] 1 (on) / 0 (off) X (window's starting position) Y (window's starting position) W (idth of window) H (eight of window) X (output window's starting position) Y (output window's starting position) W (idth of output window) H (eight of output window) 0 to 31 (red background color) 0 to 63 (green background color) 0 to 31 (blue background color)
Example	<p>ZW 000000 K 1 0 0 1280 1024 0 0 100 70 0 0 0 enable keying from (0, 0) top-left position, 1280×1024 window size, output window from (0, 0) top-left position, 100×70 output window size, and black (0, 0, 0) background color.</p> <p>ZW 000000 K 0 disable the keying function.</p>

Table 1-25 ZW Command

ZY	
Function	Enable or disable automatic color correction.
Format	ZY GGMPP C [olor correction] 1 (on) / 0 (off)
Example	ZY 00000 C 1 enable automatic color correction. ZY 00000 C 0 disable automatic color correction.

Table 1-26 ZY Command

1.3.3 Pacific C-SHS

ZC	
Function	Set the label's background color. L[label] signifies the label's background color.
Format	ZC GGMMPP L[label] RRRGGGBBB (red, green, and blue ratio ranges from 000 to 255).
Example	ZC 000000 L 255000000 set the label's background color as red.

Table 1-27 ZC Command

ZL	
Function	Set label transparency, text string and text color.
Format	ZL GGMMPP 0 to 15 (transparency) 000000000 (RRRGGGBBB set text color) "TEXT" (label text string 30 ASCII characters maximum; center aligned)
Example	ZL GGMMPP 0 255000000 "CNN News Station" set GGMMPP's label as opaque (zero transparency), text color as red, with text string "CNN News Station".

Table 1-28 ZL Command

ZM																																																												
Function 1	Change the output resolution. The resolution number corresponds to the list of resolutions/vertical frequency that Avitech device supports.																																																											
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Resolution</th> <th colspan="3">Vertical Frequency</th> </tr> <tr> <th>50 Hz</th> <th>60 Hz</th> <th>75 Hz</th> </tr> </thead> <tbody> <tr> <td>640 × 480</td> <td>N/A</td> <td>69</td> <td>N/A</td> </tr> <tr> <td>800 × 600</td> <td>42</td> <td>1</td> <td>47</td> </tr> <tr> <td>1024 × 768</td> <td>31</td> <td>2</td> <td>11</td> </tr> <tr> <td>1280 × 720</td> <td>30</td> <td>15</td> <td>48</td> </tr> <tr> <td>1280 × 768</td> <td>32</td> <td>22</td> <td>49</td> </tr> <tr> <td>1280 × 1024</td> <td>29</td> <td>9</td> <td>12</td> </tr> <tr> <td>1360 × 768</td> <td>38</td> <td>20</td> <td>21</td> </tr> <tr> <td>1400 × 1050</td> <td>34</td> <td>35</td> <td>50</td> </tr> <tr> <td>1440 × 900</td> <td>46</td> <td>45</td> <td>51</td> </tr> <tr> <td>1600 × 1200</td> <td>39</td> <td>10</td> <td>52</td> </tr> <tr> <td>1680 × 1050</td> <td>41</td> <td>40</td> <td>53</td> </tr> <tr> <td>1920 × 1080</td> <td>28</td> <td>26</td> <td>N/A</td> </tr> <tr> <td>1920 × 1200</td> <td>37</td> <td>36</td> <td>N/A</td> </tr> </tbody> </table> <p>252: VESA timing 255: normal timing</p>	Resolution	Vertical Frequency			50 Hz	60 Hz	75 Hz	640 × 480	N/A	69	N/A	800 × 600	42	1	47	1024 × 768	31	2	11	1280 × 720	30	15	48	1280 × 768	32	22	49	1280 × 1024	29	9	12	1360 × 768	38	20	21	1400 × 1050	34	35	50	1440 × 900	46	45	51	1600 × 1200	39	10	52	1680 × 1050	41	40	53	1920 × 1080	28	26	N/A	1920 × 1200	37	36	N/A
Resolution	Vertical Frequency																																																											
	50 Hz	60 Hz	75 Hz																																																									
640 × 480	N/A	69	N/A																																																									
800 × 600	42	1	47																																																									
1024 × 768	31	2	11																																																									
1280 × 720	30	15	48																																																									
1280 × 768	32	22	49																																																									
1280 × 1024	29	9	12																																																									
1360 × 768	38	20	21																																																									
1400 × 1050	34	35	50																																																									
1440 × 900	46	45	51																																																									
1600 × 1200	39	10	52																																																									
1680 × 1050	41	40	53																																																									
1920 × 1080	28	26	N/A																																																									
1920 × 1200	37	36	N/A																																																									
Format	ZM GGMMPP ## (resolution number)																																																											
Example	ZM 000000 10 set to display at 1600×1200/60Hz. ZM 000000 9 set to display at 1280×1024/60Hz.																																																											

ZM	
Function 2	Set the DVI output mode. Automatic detection of EDID data (HDMI or DVI signal) is enabled when set to automatic mode. Please note that when both HDMI and non-HDMI monitors are connected, both outputs would follow the EDID data from the HDMI monitor.
Format	ZM GGMMPP D [Vl mode] 1 (DVI mode) / 0 (automatic mode)
Example	<p>ZM 000000 D 0 enable automatic EDID data detection under DVI mode.</p> <p>ZM 000000 D 1 set to DVI mode.</p>

Table 1-29 ZM Command

ZN	
Function	Turn on/off the OSD/label/signal type/safe area/4:3 aspect ratio/audio meter/color bar/VPID. The “/A[rea]” (safe area) and “/M[eter]” (audio meter) functions will have no effect on NTSC/PAL input signal. VPID includes display of sampling structure and bit depth information as well as AFD (active format description).
Format	ZN GGMMPP option (O [SD] / L [abel] / S [ignal type] / A [rea] / D [isplay 4:3 ratio] / M [eter] / C [olor bar] / V [PID] 1 (on) / 0 (off)
Example	<p>ZN 000000 O 0 turn off the OSD (On-Screen-Display).</p> <p>ZN 000000 O 1 turn on the OSD.</p> <p>ZN 000000 L 1 turn on the label.</p>

Table 1-30 ZN Command

ZO	
Function	Set the audio output. Due to video/image processing delays, one could achieve audio/video sync by adjusting audio delay.
Format	ZO GGMMPP [1 (on) / 0 (off)] [1 (supports digital only)] [output channel to monitor through headset 1 to 4 (digital and analog will output simultaneously)] [mix mode 1 (right channel) / 2 (left channel) / 3 (stereo)] [volume 0 to 127 ; 0 is mute] [audio delay 1 to 170 millisecond; 0 is no audio delay]
Example	<p>ZO 000000 1 turn on audio.</p> <p>ZO 000000 1 1 1 3 109 9 turn on audio (digital input source, monitor output channel 1, stereo mode, volume set at 109, and audio delay set at 9 ms).</p> <p>ZO 000000 0 turn off audio.</p>

Table 1-31 ZO Command

ZP	
Function	Load a previously saved preset or save the current layout to a preset. If the filename includes a space(s), use double quotation marks to signify the complete filename.
Format	ZP GGMPP L[load] / S[ave] "filename.GP#"
Example	ZP 00000 L "Stage 1.GP1" load previously saved "Stage 1.GP1" preset file.
	ZP 00000 S "File 2.GP1" save the current layout to a preset file "File 2.GP1".

Table 1-32 ZP Command

ZR	
Function 1	Lock and adjust the aspect ratio. If the width is greater than the height, the value of width ratio must not exceed 6 times the value of height ratio (6:1 ratio). Similarly, if the height is greater than the width, the value of height ratio must not exceed 6 times the value of width ratio (1:6 ratio).
Format	ZR GGMPP [1 to 20 width ratio] [1 to 20 height ratio]
Example	ZR 00000 4 3 set window's aspect ratio as 4:3.
	ZR 00000 16 9 set window's aspect ratio as 16:9.
	ZR 00000 7 12 set window's aspect ratio as 7:12.
	ZR 00000 0 0 disable the function by setting the width or height ratio as 0.
Function 2	Enable AFD (Active Format Description) detection.
Format	ZR GGMPP AFD detect 1 (on) / 0 (off)
Example	ZR 00000 0 turn off AFD detection.
	ZR 00000 1 turn on AFD detection.

Table 1-33 ZR Command

ZS	
Function	Set the video source's sampling structure for video signal source.
Format	ZS GGMPP S(structure) 0 (video channel A) / 1 (video channel B)
Example	ZS 00000 S 0 select video channel A.
	ZS 00000 S 1 select video channel B.

Table 1-34 ZS Command

ZW	
Function	Set window position and size, or crop a window. When cropping, the X/Y position, width, and height are calculated based on the module's input signal resolution. The value for W (idth) and H (eight) must be greater than 20% of the input signal resolution width and height. For example, if the module's input signal resolution is 1280×1024 @ 60Hz, then the width is 1280 and the height is 1024. The cropped window size must be greater than 256 (20% of 1280) × 204 (20% of 1024).
Format	ZW GGMPP C [rop] 1 (on) / 0 (off) X position Y position W (idth) H (eight) panel width panel height
Example	ZW 000000 C 1 0 0 320 240 1280 1024 crop from (0, 0) top-left position, 320×240 window size, 1280×1024 input signal resolution. ZW 000000 C 1 0 0 320 240 crop from (0, 0) top-left position, 320×240 window size. ZW 000000 C 0 disable the cropping function.

Table 1-35 ZW Command

ZX	
Function	Change the label text and font size. Include the quotation marks when entering the label text string (30 characters maximum for each label; center-aligned). The width of the label's background is fixed (following the width of the window).
Format	ZX GGMPP "label text" (supports ASCII characters only – include the quotation marks) # (font size 1 to 4)
Example	ZX 000000 "Input 1" Input 1 will appear as the label. ZX 000000 3 set the label font size to 3.

Table 1-36 ZX Command

ZY	
Function	Enable or disable automatic color correction.
Format	ZY GGMPP C [olor correction] 1 (on) / 0 (off)
Example	ZY 000000 C 1 enable automatic color correction. ZY 000000 C 0 disable automatic color correction.

Table 1-37 ZY Command

1.3.4 Pacific C-A/C-AG

ZB																
Function	<p>Turn on/off PiP(Picture-in-Picture) and select the input source for the PiP window.</p> <p>ZB GGMPP [PiP window 1 (on) / 0 (off) source X position Y position W(idth) H(eight)]</p> <p>❖ The input source values are assigned as follows: 2 = HDMI 3 = DVI 4 = VGA 5 = YPbPr 6 = SDI</p> <p>The values of W(idth) and H(eight) must be greater than 20% of the input signal resolution width and height.</p> <p>For example, if the module's input signal resolution is 1280×1024 @ 60Hz, then the width is 1280 and the height is 1024. The cropped window size must be greater than 256 (20% of 1280) × 204 (20% of 1024).</p>															
Format	<p><i>Note:</i></p> <ol style="list-style-type: none"> When DVI is selected as the input source for the Main window, HDMI cannot be assigned to the PiP window. When HDMI is selected as the input source for the Main window, DVI cannot be assigned to the PiP window. Window size is limited by the output resolution as follows: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Output resolution</th> <th>Max. Width</th> <th>Max. Height</th> </tr> </thead> <tbody> <tr> <td>1080p</td> <td>1920</td> <td>1080</td> </tr> <tr> <td>720p</td> <td>1280</td> <td>720</td> </tr> <tr> <td>SD_525</td> <td>720</td> <td>487</td> </tr> <tr> <td>SD_625</td> <td>720</td> <td>576</td> </tr> </tbody> </table>	Output resolution	Max. Width	Max. Height	1080p	1920	1080	720p	1280	720	SD_525	720	487	SD_625	720	576
Output resolution	Max. Width	Max. Height														
1080p	1920	1080														
720p	1280	720														
SD_525	720	487														
SD_625	720	576														
	<p>ZB 000000 0 turn off PiP.</p> <p>ZB 000000 1 turn on PiP.</p> <p>ZB 000000 1 2 turn on PiP and set HDMI as the input.</p>															
Example	<p>ZB 000000 0 2 turn off PiP and set HDMI as the input.</p> <p>ZB 000000 1 6 50 100 1000 1000 turn on PiP and set SDI as the input; position the PiP window starting at (50, 100) with window width and height = (1000, 1000) respectively.</p> <p>ZB 000000 1 6 0 0 960 540 turn on PiP and set SDI as the input; position the PiP window starting at (0, 0) with window width and height = (960, 540) respectively.</p>															

Table 1-38 ZB Command

ZG	
Function	The genlock feature allows frame synchronization of video sources (DVI-I IN , SDI/CVBS IN , and HDMI IN ports' signals synchronized to the REF IN signal).
Format	<p>ZG GGMPP L(ock) [1 (on) / 0 (off)] [timing type] [delay lines]</p> <ul style="list-style-type: none"> ❖ Timing Type <ul style="list-style-type: none"> ✓ SD 20 (SD_525) / 21 (SD_625) ✓ 720p 1 (30Hz) / 2 (29.97Hz) / 3 (25Hz) / 4 (24Hz) / 5 (23.98Hz) / 8 (60Hz) / 22 (59.94Hz) / 23 (50Hz) ✓ 1080i 11 (60Hz) / 18 (50Hz) / 30 (59.94Hz) ✓ 1080PsF 6 (24Hz) / 7 (23.98Hz) ✓ 1080p 17 (60Hz) / 19 (50Hz) / 24 (59.94Hz) / 25 (30Hz) / 26 (29.97Hz) / 27 (25Hz) / 28 (24Hz) / 29 (23.98Hz) ✓ 2048x1080p 15 (23.98Hz) / 16 (24Hz) ❖ Delay Lines <ul style="list-style-type: none"> <i>Must not exceed the output resolution's "V-total":</i> ✓ For SD 525 signal up to 524 delay lines ✓ For SD 625 signal up to 624 delay lines ✓ For 720p signal up to 749 delay lines ✓ For 1080p or 1080i or 2048x1080p signal up to 1124 delay lines
Example	<p>ZG 00000 L 0 turn off genlock.</p> <p>ZG 00000 L 1 11 120 turn on genlock and set the output signal at 1080i 60Hz with 120 delay lines.</p>

Table 1-39 ZG Command



Make sure that the following conditions are met before using the ZG ASCII command –

1. Pacific C-AG must have the genlock feature (**Ref IN** port).
2. The LCD panel must be set to the following: Output Port → SDI "On" → Standard "SMPTE".

ZH	
Function	Display input and output information.
Format	ZH GGMPP
Example	ZH 00000 display the Main/PIP source information (signal type, horizontal/vertical frequency, and total/starting timing flag) and output information (signal type, audio, color correction, source sampling, and color depth).

Table 1-40 ZH Command

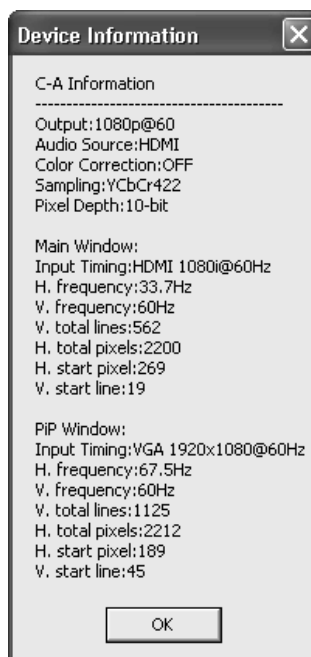


Figure 1-12 Input and Output Information

ZI	
Function	Select the input source for the Main window.
Format	ZI GGMPP source ❖ The source values are: 1 = automatic scan 2 = HDMI 3 = DVI 4 = VGA 5 = YPbPr 6 = SDI.
Example	ZI 00000 1 set to automatically scan the input source. ZI 00000 2 set HDMI as the input source.

Table 1-41 ZI Command

ZJ	
Function	Automatically adjust the analog VGA signal entering the Input port. I [image] will automatically perform image alignment adjustment. G [ain] will automatically adjust image gain.
Format	ZJ GGMMPP 0 [main window] / 1 [PiP window] I [image] / G [ain]
Example	<p>ZJ 00000 0 I automatically perform image alignment adjustment for the Main window.</p> <p>ZJ 00000 1 G automatically adjust image gain for the PiP window.</p>

Table 1-42 ZJ Command

ZM																																																												
Change the output resolution. The resolution number corresponds to the list of resolutions/vertical frequency that Avitech device supports.																																																												
For "SMPTE" standard –																																																												
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Vertical Frequency</th> <th colspan="5">Resolution</th> </tr> <tr> <th>720p</th> <th>1080i</th> <th>1080p</th> <th>1080PsF</th> <th>2048p</th> </tr> </thead> <tbody> <tr><td>23.98 Hz</td><td>5</td><td>N/A</td><td>29</td><td>7</td><td>15</td></tr> <tr><td>24 Hz</td><td>4</td><td>N/A</td><td>28</td><td>6</td><td>16</td></tr> <tr><td>25 Hz</td><td>3</td><td>N/A</td><td>27</td><td>N/A</td><td>N/A</td></tr> <tr><td>29.97 Hz</td><td>2</td><td>N/A</td><td>26</td><td>N/A</td><td>N/A</td></tr> <tr><td>30 Hz</td><td>1</td><td>N/A</td><td>25</td><td>N/A</td><td>N/A</td></tr> <tr><td>50 Hz</td><td>23</td><td>18</td><td>19</td><td>N/A</td><td>N/A</td></tr> <tr><td>59.94 Hz</td><td>22</td><td>30</td><td>24</td><td>N/A</td><td>N/A</td></tr> <tr><td>60 Hz</td><td>8</td><td>11</td><td>17</td><td>N/A</td><td>N/A</td></tr> </tbody> </table>		Vertical Frequency	Resolution					720p	1080i	1080p	1080PsF	2048p	23.98 Hz	5	N/A	29	7	15	24 Hz	4	N/A	28	6	16	25 Hz	3	N/A	27	N/A	N/A	29.97 Hz	2	N/A	26	N/A	N/A	30 Hz	1	N/A	25	N/A	N/A	50 Hz	23	18	19	N/A	N/A	59.94 Hz	22	30	24	N/A	N/A	60 Hz	8	11	17	N/A	N/A
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60 Hz	8	11	17	N/A	N/A																																																							
SD_525 = 20 SD_625 = 21																																																												
Function	For "VESA" standard –																																																											
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Resolution	Vertical Frequency																																																											
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1400 × 1050	34	35	50																																																									
1440 × 900	46	45	51																																																									
1600 × 1200	39	10	52																																																									
1680 × 1050	41	40	53																																																									
1920 × 1080	28	26	N/A																																																									
1920 × 1200	37	36	N/A																																																									
Format	ZM GGMMPP [1 (on) / 0 (off)] SDI output] ## (resolution number) [1 (VESA) / 0 (SMPTE) standard]																																																											
Example	<p>ZM 000000 1 8 0 turn on SDI output; set to display at 720p/60Hz compliant to SMPTE standard.</p> <p>ZM 000000 0 8 0 turn off SDI output; set to display at 720p/60Hz compliant to SMPTE standard.</p> <p>ZM 000000 1 15 1 turn on SDI output; set to display at 1280×720/60Hz compliant to VESA standard.</p> <p>ZM 000000 0 15 1 turn off SDI output; set to display at 1280×720/60Hz compliant to VESA standard.</p>																																																											

Table 1-43 ZM Command

ZN	
Function	Turn on/off the color bar and set the pattern. <i>Note: The color bar can only be turned on/off if there is no input signal.</i>
Format	ZN GGMMPP [C[olor bar] 1 (on) / 0 (off)] [1 (rectangle) / 0 (color bar) pattern]
Example	ZN 000000 C 0 turn off the color bar. ZN 000000 C 1 1 turn on the color bar and set to rectangle pattern.

Table 1-44 ZN Command

ZO	
Function 1	Set the audio output. Due to video/image processing delays, one could achieve audio/video sync by adjusting audio delay.
Format	ZO GGMMPP [A[udio] [1 (on) / 0 (off)] [input type 0 (follow video) / 1 (analog) / 2 (digital, SDI) / 3 (digital, HDMI)] [audio delay 1 to 170 millisecond, 0 is no audio delay]
Example	ZO 000000 A 1 turn on audio (analog audio source). ZO 000000 A 1 2 170 turn on audio; select SDI input source, and maximize audio delay time. ZO 000000 A 0 turn off audio. ZO 000000 A 1 0 170 turn on audio; set audio source to follow video source, and maximize audio delay time.
Function 2	Set the headphone's audio output.
Format	ZO GGMMPP [H[eadphone] [1 (on) / 0 (off)] [input type 0 (analog) / 1 (Pacific, digital only)] [output channel to monitor through headset 1 to 4] [mix mode 1 (right channel) / 2 (left channel) / 3 (stereo)] [volume 0 to 127 , 0 is mute]
Example	ZO 000000 H 1 turn on headphone. ZO 000000 H 1 1 1 3 109 turn on headphone (digital input source, monitor output channel 1, stereo mode, and volume set at 109). ZO 000000 H 0 turn off headphone.

Table 1-45 ZO Command

ZP	
Function	Load a previously saved preset or save the current layout to a preset. If the filename includes a space(s), use double quotation marks to signify the complete filename.
Format	ZP GGMMPP L[oad] / S[ave] "filename.GP#"
Example	ZP 000000 L "Stage 1.GP1" set all modules to load the previously saved "Stage 1.GP1" preset file. ZP 000000 S "File 2.GP1" save the current layout to a preset file "File 2.GP1".

Table 1-46 ZP Command

ZR	
Function	Lock and adjust the aspect ratio. If the width is greater than the height, the value of width ratio must not exceed 6 times the value of height ratio (6:1 ratio). Similarly, if the height is greater than the width, the value of height ratio must not exceed 6 times the value of width ratio (1:6 ratio).
Format	ZR GGMPP 0 [Main window] / 1 [PiP window] [1 to 20 width ratio] [1 to 20 height ratio]
Example	<p>ZR 00000 0 4 3 set the Main window's aspect ratio as 4:3.</p> <p>ZR 00000 1 16 9 set the PiP window's aspect ratio as 16:9.</p> <p>ZR 00000 0 7 12 set the Main window's aspect ratio as 7:12.</p> <p>ZR 00000 0 0 0 disable the aspect ratio by setting the width or height ratio as 0.</p>

Table 1-47 ZR Command

ZS	
Function	Set the video channel's sampling structure and bit depth for video signal source. <i>Note:</i> 1. Map structure is not supported in the case where output resolution is at SD_525, SD_625, 1080p 50Hz/ 59.94Hz/60Hz. 2. The LCD panel must be set to the following: Output Port → SDI "On" → Standard "SMPTE".
Format	ZS GGMPP S (structure) [0 (YCbCr 4:2:2) / 1 (YCbCr 4:4:4) / 2 (RGB 4:4:4) / 3 (XYZ 4:4:4)] [1 (10) / 2 (12) bit depth] [SMPTE 425M Level 0 (A) / 1 (B)]
Example	<p>ZS 00000 S 0 1 1 select YCbCr 4:2:2 sampling structure, 10-bit pixel depth, and SMPTE 425M Level B.</p> <p>ZS 00000 S 1 2 0 select YCbCr 4:4:4 sampling structure, 12-bit pixel depth, and SMPTE 425M Level A.</p>

Table 1-48 ZS Command

Category	Source Image Format	Reference SMPTE Standard	Image Format	Sampling Structure / Pixel Depth	Frame/Field Rate
SMPTE 425 Level A	Mapping Structure 1	274M	1920 x 1080	4:2:2 YcbCr/10bit	60, 59.94, 50 Progressive
	Mapping Structure 2	296M	1280 x 720	4:4:4 RGB; 4:4:4 YcbCr	60, 59.94, 50 Progressive 25, 24, 23.98 Progressive
		274M	1920 x 1080	4:4:4 RGB; 4:4:4 YcbCr	60, 59.94, 50 Field Interlaced 30, 29.97, 25, 24, 23.98 Progressive 30, 29.97, 25 PsF
	Mapping Structure 3	274M	1920 x 1080	4:4:4 RGB/12bit; 4:4:4 YcbCr/12bit;	60, 59.94, 50 Field Interlaced 30, 29.97, 25, 24, 23.98 Progressive
		428-1	2048 x 1080	4:4:4 XYZ/12bit	24 Progressive
SMPTE 425 Level B	Mapping Structure 5	372M	1920 x 1080	4:2:2 YcbCr/10bit	60, 59.94, 50 Progressive
	Mapping Structure 6	372M	1920 x 1080	4:4:4 RGB; 4:4:4 YcbCr	60, 59.94, 50 Field Interlaced 30, 29.97, 25, 24, 23.98 Progressive 30, 29.97, 25 PsF
	Mapping Structure 7	372M	1920 x 1080	4:4:4 RGB/12bit; 4:4:4 YcbCr/12bit;	60, 59.94, 50 Field Interlaced 30, 29.97, 25, 24, 23.98 Progressive 30, 29.97, 25 PsF

Table 1-49 Mapping Structure

ZW	
	Set the window position and size, or crop a window. When cropping, the X/Y position, width, and height are calculated based on the module's input signal resolution.
Function 1	<p>The value of W(idth) and H(eight) must be greater than 20% of the input signal resolution width and height. For example, if the module's input signal resolution is 1280×1024 @ 60Hz, then the width is 1280 and the height is 1024. The cropped window size must be greater than 256 (20% of 1280) × 204 (20% of 1024).</p> <p>To put it simply, the smallest valid crop size is 20% the total height by 20% the total width.</p>
Format	ZW GGMPP C [rop] 1 (on) / 0 (off) X position Y position W (idth) H (eight) panel width panel height
Example	<p>ZW 000000 C 1 0 0 320 240 1280 1024 crop from (0, 0) top-left position, 320×240 window size, 1280×1024 input signal resolution.</p> <p>ZW 000000 C 1 0 0 320 240 crop from (0, 0) top-left position, 320×240 window size.</p> <p>ZW 000000 C 0 disable the cropping function.</p>
	Keying Crop values: set the keying (overlay) parameters to superimpose the inputted computer image on top of an existing video signal.
	When cropping, the X/Y position, width, and height are calculated based on the module's output resolution. The value of crop W (idth) and crop H (eight) must be greater than 20% of the output resolution's width and height.
Function 2	<p>The value of X output position, Y output position, output resolution width, and output resolution height pertains to the output window's starting position and size. For example, if the module's input display timing is 1280×1024 @ 60Hz, then the output resolution width is 1280 and the output resolution height is 1024. The cropped window size must be greater than 256 (20% of 1280) × 204 (20% of 1024).</p> <p>To put it simply, the smallest valid crop size is 20% the total height by 20% the total width.</p>
Format	ZW GGMPP [K (eying) 1 (on) / 0 (off)] [X crop position Y crop position crop W (idth) crop H (eight)] [X output position Y output position output panel width output panel height] [(0 to 31) red (0 to 63) green (0 to 31) blue background color]
Example	<p>ZW 000000 K 1 0 0 1280 1024 0 0 100 70 0 0 0 crop from (0,0) top-left position, 1280×1024 window size, output window (0,0) top-left position, 100×70 output display size, 0,0,0 RGB value of background color.</p> <p>ZW 000000 K 0 disable the keying function.</p>

Table 1-50 ZW Command

ZY	
Function	Enable or disable automatic color correction.
Format	ZY GGMPP C [olor correction] 1 (on) / 0 (off)
Example	<p>ZY 000000 C 1 enable automatic color correction.</p> <p>ZY 000000 C 0 disable automatic color correction.</p>

Table 1-51 ZY Command

1.3.5 Rainier 4U/4U1V

ZC	
Function	Set window border and label's background color. B [order] signifies window border. L [label] signifies label's background color. K [ey] signifies color key for compositing two images together [NoDimColor] signifies removal of border's gradient effect.
Format	ZC GGMMPP [B[order]/L[label]/K[key] RRRGGGBBB (red, green and blue ratio ranges from 000 to 255) (NoDimColor)
Example	<p>ZC 010101 B 000255000 set border color for window 1 of module 1, group 1 as green with gradient effect.</p> <p>ZC 010101 B 000255000 ndc set border color for window 1 of module 1, group 1 as green without gradient effect.</p> <p>ZC 200101 L 255000000 set label's background color for window 1 of module 1, group 20 as red with gradient effect.</p> <p>ZC 000000 K 000000255 set the color key as blue for compositing the images.</p>

Table 1-52 ZC Command

ZF	
Function	Turn on/off a video window's full screen mode.
Format	ZF GGMMPP 1 (on) / 0 (off)
Example	<p>ZF 010104 1 set window 4 of module 1, group 1 to full screen.</p> <p>ZF 010104 0 disable full screen mode for window 4 of module 1, group 1, and revert it back to its former display size.</p> <p>ZF 010105 1 set group 1, module 1, cascade-in source (DVI-I Input port) to full screen.</p>

Table 1-53 ZF Command

ZJ	
Function	Automatically adjust the analog VGA signal entering the DVI-I Input port. I [image] will automatically perform image alignment adjustment (position and size). G [ain] will automatically adjust the image gain.
Format	ZJ GGMMPP I [image] / G [ain]
Example	<p>ZJ 000000 I automatically perform image alignment adjustment (position and size).</p> <p>ZJ 020000 G automatically adjust the image gain for all modules in group 2.</p>

Table 1-54 ZJ Command

ZM

Change the output resolution. The resolution number corresponds to the list of resolutions/vertical frequency that Avitech device supports.

Function	Resolution	Vertical Frequency		
		50 Hz	60 Hz	75 Hz
	800 × 600	42	1	47
	1024 × 768	31	2	11
	1280 × 720	30	15	48
	1280 × 768	32	22	49
	1280 × 1024	29	9	12
	1360 × 768	38	20	21
	1400 × 1050	34	35	50
	1440 × 900	46	45	51
	1600 × 1200	39	10	52
	1680 × 1050	41	40	53
	1920 × 1080 (1080p)	28	26	N/A
	1920 × 1200	37	36	N/A

Format **ZM GGMMPP ##** (resolution number)

Example **ZM 010000 10**
set all modules in group 1 to display at 1600×1200/60Hz.

Example **ZM 000000 9**
set to display at 1280×1024/60Hz.

Table 1-55 ZM Command



Maximum resolution supported by Rainier-4a/-4d is 1440×900.

ZN

Function 1	Turn on/off Rainier DVI Cascade In Mode. By default, the DVI input on the Rainier fills the entire screen behind the video windows (Cascade In mode). To enable the DVI input as a scalable window, turn off the Rainier Cascade In Mode.
Format	ZN GGMMPP C[ascade] [1 (on) / 0 (off)]
Example	ZN 010100 C 0 turn off cascade in mode of module 1 of group 1.
Function 2	Turn on/off the window.
Format	ZN GGMMPP (DVI Cascade In window if PP = 05) W[indow] [1 (on) / 0 (off)]
Example	ZN 010104 W 0 turn off the window 4 of module 1, group 1.
Function 3	Turn on/off the OSD of all window of the Rainier module.
Format	ZN GGMMPP O[SD] [1 (on) / 0 (off)]
Example	ZN 010100 OSD 0 turn off the OSD of all windows of module 1, group 1. <i>Note: Value of PP should be "0" when turning on/off the OSD</i>

Table 1-56 ZN Command

ZO	
Function 1	Set audio meter properties.
Format	ZO GGMPP M [eter] 1–4 (group) 0 (main channel) / 1 (sub channel) 0 (PPM) / 1 (VU ballistics)
Example	ZO 010203 M 1 0 0 set group 1 main channel as the audio meter source for window 3 of module 2, group 1; display mode is set to PPM.
Function 2	Turn on/off audio output and set output mode. <i>Note: Value of MMPP should not be "0" when turning on audio output.</i>
Format	ZO GGMPP [O[output] 1 (on) / 0 (off)] [mode 1 (stereo) / 2 (mono left) / 3 (mono right)]
Example	ZO 020000 0 0 turn off audio output for group 2. ZO 010101 0 1 turn on audio output for window 1 of module 1, group 1. ZO 020202 0 1 1 turn on audio output for window 2 of module 2, group 2, and select stereo mode.

Table 1-57 ZO Command

ZP	
Function	Load a previously saved preset or save the current layout to a preset. If the filename includes a space(s), use double quotation marks to signify the complete filename.
Format	ZP GGMPP L[oad] / S[ave] "filename.GP#"
Example	ZP 010000 L "Stage 1.GP1" set all modules in group 1 to load the previously saved "Stage 1.GP1" preset file. ZP 020000 S "File 2.GP2" save the current layout of all modules in group 2 to a preset file "File 2.GP2".

Table 1-58 ZP Command

ZT	
Function	Turn on/off tally for a window(s) in a group. Color index number corresponds to the list of colors that tally supports.
Format	ZT GGMPP [(1/2 = tally 1/2) 1 (on) / 0 (off) # (color index number)]
Example	ZT 000000 2 1 6 activate tally 2 with color pink for all windows. ZT 010203 1 0 deactivate tally 1 for window 3 of module 2, group 1.

Index	Color	Index	Color
1	Null	5	Blue
2	Red	6	Pink
3	Green	7	Light Blue
4	Yellow	8	White

Table 1-59 ZT Command



Upon changing the color of a tally, the same color will be applied to other tally(s) of the same module.

ZW	
Function	Set window position and size; set window priority (set the topmost window).
Format	ZW GGMMPP (DVI Cascade In window if PP = 05) X position Y position W (idth) H (eight)
Example	<p>ZW GGMM01 set GGMM window 1 as the topmost window.</p> <p>ZW 010105 10 20 400 300 set DVI Cascade In window of module 1, group 1at (10, 20) top-left position with size 400x300.</p> <p>ZW 010102 600 500 350 460 set window 2 of module 1, group 1 at (600, 500) top-left position with size 350x460.</p> <p>ZW 010101 0 0 0 0 turn off window 1 of module 1, group 1 by setting its width or height as 0.</p>

Table 1-60 ZW Command

ZX	
Function	Change the label text and font size (label text will be center-aligned; maximum of 32 characters for each label).
Format	ZX GGMMPP ["label text" (supports ASCII characters only – include the quotation marks) # (font size; 1 to 4 = available size)]
Example	<p>ZX 000000 "Input 1" Input 1 will appear as the label for all windows.</p> <p>ZX 000000 3 set all windows' label font size to 3.</p>

Table 1-61 ZX Command

1.3.6 Titan 8000

ZA	
Function	Set to automatically arrange window and clock layout.
Format	ZA GGMMP [NByN(2,3,.....)] [Nth(1,2,.....)]
Example	ZA 010900 2 1 Place all windows of module 9, group 1 to a 2×2 map, position 1, 2, 3, and 4 (quad-split).
	ZA 010000 2 1 Place all windows of group 1 to a 2×2 map, position 1, 2, 3, and 4 (quad-split).
	ZA 010202 3 2 Place window 2 of module 2, group 1 to a 3×3 map, position 2.
	ZA 010200 6 13 Place all windows of module 2, group 1 to a 6×6 map, position 13, 14, 15, and 16.
	ZA 000000 Automatically arrange all windows to the optimum size and position.
	ZA 010199 3 9 Place the clock of module 1, group 1 to a 3×3 map, position 9.

Table 1-62 ZA Command

ZC	
Function	Set window border, clock, and label's background color. B[order] signifies window border. L[label] signifies label's background color. [NoDimColor] signifies removal of border's gradient effect.
Format	ZC GGMMP (clock window if PP = 99) [B[order]/L[label] RRRGGGBBB (red, green, and blue ratio ranges from 000 to 255) (NoDimColor)
Example	ZC 010101 B 000255000 set border color for window 1 of module 1, group 1 as green with gradient effect.
	ZC 010101 B 000255000 ndc set border color for window 1 of module 1, group 1 as green without gradient effect.
	ZC 200101 L 255000000 set label's background color for window 1 of module 1, group 20 as red with gradient effect.
	ZC 010101 B 000000000 turn off border for window 1 of module 1, group 1.
	ZC 020299 B 255000255 set digital clock color for module 2 of group 2 as pink.
	ZC 010199 L 255000255 set clock label's background color for module 1 of group 1 as pink.

Table 1-63 ZC Command

ZE	
Function	Turn on/off echo (command response would be faster when echo is turned off).
Format	ZE GGMM 1 (on) / 0 (off)
Example	ZE GGMM 0 turn off echo.

Table 1-64 ZE Command

ZF	
Function	Turn on/off the video window's full screen mode.
Format	ZF GGMMPP 1 (on) / 0 (off)
Example	ZF 010104 1 set window 4 of module 1, group 1 to full screen. ZF 010104 0 disable full screen mode for window 4 of module 1, group 1, and revert it back to its former display size.

Table 1-65 ZF Command

ZH	
Function	Display the device's connection status.
Format	ZH GGMMPP
Example	ZH 000000 display the device's connection status. <i>Note:</i> <i>If the RS-485 cascade cables are loose between modules, or if one of the cascaded modules is powered down, then the connection status from that module would not have responded.</i>

Table 1-66 ZH Command

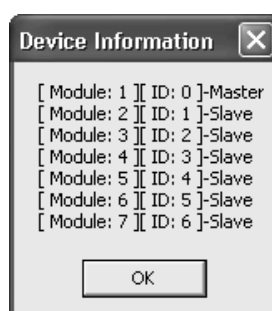


Figure 1-13 Connection Status

ZI	
Function	Set the input channel for clock. The input channel values for clock are 1 = internal (also known as “free run” – set per module; or 6 = NTP (Network Time Protocol).
Format	ZI GGMMPP (clock window if PP = 99) channel
Example	ZI GGMM99 1 set GGMM's clock time to synchronize with the internal.

Table 1-67 ZI Command

ZJ	
Function	Automatically adjust the analog VGA signal entering the DVI-I Input port. I[<i>image</i>] will automatically perform image alignment adjustment (position and size). G[<i>ain</i>] will automatically adjust image gain.
Format	ZJ GGMMPP I[<i>image</i>] / G[<i>ain</i>]
Example	ZJ 00000 I automatically perform image alignment adjustment. ZJ 02000 G automatically adjust the image gain on all modules of group 2.

Table 1-68 ZJ Command

ZK	
Function 1	Set the time and method of counting (free run mode only).
Format	ZK GGMM P [reset] S[<i>et</i>]/L[<i>oad</i>] Analog clock ID (1–5) Preset ID (1–8) HH MM SS
Example	ZK GGMM P S 1 11 22 33 set GGMM's preset time ID1 to 11:22:33. ZK GGMM P L 1 set GGMM's time as preset time ID1. ZK GGMM P 2 use analog clock shape #2.
Function 2	Set the time and format for control.
Format	ZK GGMM [HH MM SS 0 (count down) / 1 (count up) / 2 (pause) counting method / 3 (do not pause) / 4 (invert pause status)]
Example	ZK GGMM 11 22 33 set GGMM's time to 11:22:33. ZK GGMM 11 22 33 0 set GGMM's time to 11:22:33 and counting down. ZK GGMM 1 set GGMM's clock to start counting up.

Table 1-69 ZK Command

ZL	
Function	Set label/clock's transparency, text string, text color and label color.
Format	ZL GGMMPP [0 transparency] RRRGGBBB set text color RRRGGBBB set label color "TEXT" (label text string 32 ASCII characters maximum)]
Example	ZL GGMMPP 0 25500000 00000255 "CNN News Station" set GGMMPP's text color as red, label color as blue, with text string "CNN News Station". ZL GGMM99 0 255255255 00000255 "CLOCK" set the clock's text color as white, label color as blue, with text string "CLOCK".

Table 1-70 ZL Command



Even though Titan 8000 does not support transparent label, the parameter is necessary for compatibility with Avitech MCC 8004.

ZM

Change the output resolution. The resolution number corresponds to the list of resolutions/vertical frequency that Avitech device supports.

Resolution	Vertical Frequency		
	50 Hz	60 Hz	75 Hz
800 × 600	42	1	47
1024 × 768	31	2	11
1280 × 720	30	15	48
1280 × 768	32	22	49
1280 × 1024	29	9	12
1360 × 768	38	20	21
1400 × 1050	34	35	50
1440 × 900	46	45	51
1600 × 1200	39	10	52
1680 × 1050	41	40	53
1920 × 1080 (1080p)	28	26	N/A
1920 × 1200	37	36	N/A

252: VESA timing

255: Normal timing

Format **ZM GGMMPP ##** (resolution number) [No Automatic arrangement of all windows to optimum size and position]

Example
ZM 010000 10
 set all modules in group 1 to display at 1600×1200/60Hz and automatically arrange all windows to optimum size and position.

ZM 000000 9 NA
 set to display at 1280×1024/60Hz without automatic window arrangement.

Table 1-71 ZM Command

ZN

Function Turn on/off various options.

Format **ZN GGMMPP** (clock window if **PP = 99**) [**O**[SD – on screen display]/**B**[order]/ **I**[image automatic adjustment – VGA]/**G**[ain]/**W**[indow] **1** (on) / **0** (off)]

Example
ZN 000000 0 0
 turn off OSD (On-Screen-Display).

ZN 010100 0 1
 turn on OSD of module 1, group 1.

ZN 030303 L 1
 turn on label for window 3 of module 3, group 3.

ZN 030399 L 1
 turn on clock label for module 3, group 3.

ZN 050505 I 1
 turn on automatic image adjustment for VGA window 5 of module 5, group 5.

ZN 050505 G 0
 turn off automatic gains for VGA window 5 of module 5, group 5.

ZN 020202 B 0
 turn off border for window 2 of module 2, group 2.

ZN
ZN 020299 B 0 turn off clock border for module 2, group 2.
ZN 040400 W 0 turn off all windows of module 4, group 4.
ZN 040499 W 0 turn off clock for module 4, group 4.

Table 1-72 ZN Command



1. Turning on automatic image adjustment and automatic gain will only affect window with VGA source.
2. Image window will be positioned at (0, 0) and be 1/16 of display size upon turning on a closed image window.

ZP	
Function	Load a previously saved preset or save the current layout to a preset. If the filename includes a space(s), use double quotation marks to signify the complete filename.
Format	ZP GGMMPP L[oad] / S[ave] "filename.GP#"
Example	ZP 010000 L "Stage 1.GP1" set all modules in group 1 to load the previously saved "Stage 1.GP1" preset file. ZP 020000 S "File 2.GP2" save the current layout of all modules in group 2 to a preset file "File 2.GP2".

Table 1-73 ZP Command

ZR	
Function	Lock and adjust the aspect ratio.
Format	ZR GGMMPP [SD video width ratio SD video height ratio HD video width ratio HD video height ratio]
Example	ZR GGMM01 4 3 16 9 set GGMM01's SD video aspect ratio as 4:3 and HD video aspect ratio as 16:9. ZR 000000 16 9 4 3 set all windows' SD video aspect ratio as 16:9 and HD video aspect ratio as 4:3. ZR GGMMPP 7 12 7 12 set GGMMPP's SD and HD video aspect ratio as 7:12. ZR 000000 0 0 0 0 disable the function by setting the width or height ratio as 0.

Table 1-74 ZR Command

ZT																					
	Turn on/off tally for a window(s) in a group. Color index number corresponds to the list of colors that tally supports.																				
Function	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Index</th> <th>Color</th> <th>Index</th> <th>Color</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Null</td> <td>5</td> <td>Blue</td> </tr> <tr> <td>2</td> <td>Red</td> <td>6</td> <td>Pink</td> </tr> <tr> <td>3</td> <td>Green</td> <td>7</td> <td>Light Blue</td> </tr> <tr> <td>4</td> <td>Yellow</td> <td>8</td> <td>White</td> </tr> </tbody> </table>	Index	Color	Index	Color	1	Null	5	Blue	2	Red	6	Pink	3	Green	7	Light Blue	4	Yellow	8	White
Index	Color	Index	Color																		
1	Null	5	Blue																		
2	Red	6	Pink																		
3	Green	7	Light Blue																		
4	Yellow	8	White																		
Format	ZT GGMMPP [(1 = only tally 1 is available for Titan 8000) 1 (on) / 0 (off) # (color index number)]																				
Example	<p>ZT 00000 2 1 6 activate tally 2 with color pink for all windows.</p> <p>ZT 010203 1 0 deactivate tally 1 for window 3 of module 2, group 1.</p>																				

Table 1-75 ZT Command



Upon changing the color of a tally, the same color will be applied to other tally(s) of the same module.

ZW	
Function 1	Set window position and size; set window priority (set the topmost window).
Format	ZW GGMMPP (clock window if PP = 99) X position Y position W (idth) H (eight)
Example	<p>ZW GGMM01 set GGMM window 1 as the topmost window.</p> <p>ZW GGMMPP 100 200 300 400 set GGMMPP window at (100, 200) top-left position with size 300x400.</p> <p>ZW 010101 0 0 0 0 turn off window 1 of module 1, group 1 by setting its width or height as 0.</p> <p>ZW 010199 0 0 320 240 set the clock window position of module 1, group 1 at (0, 0) with size 320x240.</p>
Function 2	Set the window position and size, or crop a window. When cropping, the X/Y position, width, and height are calculated based on the module's output resolution. For example, if the module's output resolution is 1280x1024 @ 60Hz, then the width is 1280 and the height is 1024. There is no need to take the input image size/position or the window size into account. The cropping function always presumes that the input image size is equal to the output resolution.
Format	ZW GGMMPP C [rop] 1 (on) / 0 (off) X position Y position W (idth) H (eight) panel width panel height
Example	<p>ZW 000000 C 1 100 100 320 240 crop from (100, 100) top-left position, 320x240 window size.</p> <p>ZW 000000 C 1 0 0 320 240 crop from (0, 0) top-left position, 320x240 window size.</p> <p>ZW 000000 C 0 disable the cropping function.</p>

Table 1-76 ZW Command

ZX	
Function	Change the label text and font size.
Format	ZX GGMPP (clock window if PP = 99) ["label text" (supports ASCII characters only – include the quotation marks, maximum of 32 characters) # (font size; 1 to 4 = available size)]
Example	<p>ZX 00000 "Input 1" Input 1 will appear as the label for all windows.</p> <p>ZX 00000 3 set all windows' label font size to 3.</p> <p>ZX 010199 "CLOCK" 4 set clock label of module 1, group 1 as "CLOCK" and set font size to 4.</p>

Table 1-77 ZX Command

Appendix A Sending ASCII Z Command Through RS-232

Aside from the Ethernet port (**IP**), the serial port (**RS-232**) on the Titan 8000 and Rainier 4U/4U1V can also be used to interface with a third-party controller for control over RS-232.

A.1 Setting the Avitech Module's RS-232 Port

Before using the ASCII Z command interface, make sure that the COM A (RS-232) port on the Titan 8000 or Rainier 4U/4U1V is set at Normal (8-bit data, 1 stop bit, no parity, and no flow control). The default baud rate is 57600 bps. To correctly use the ASCII Z commands, use the Phoenix-G (formerly Galaxy) software's default Group and Module Number for the Titan 8000 and Rainier 4U/4U1V.



1. To set **COM A** to **Normal**, click **Settings**→**Group Parameter**→**COM A**. Select **Normal** on the **Mode** drop-down menu. Then click **OK**.
2. Disconnect the SCP keypad if it is connected.

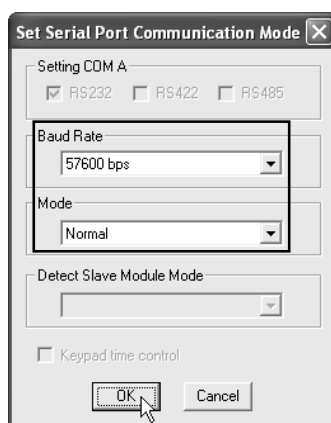


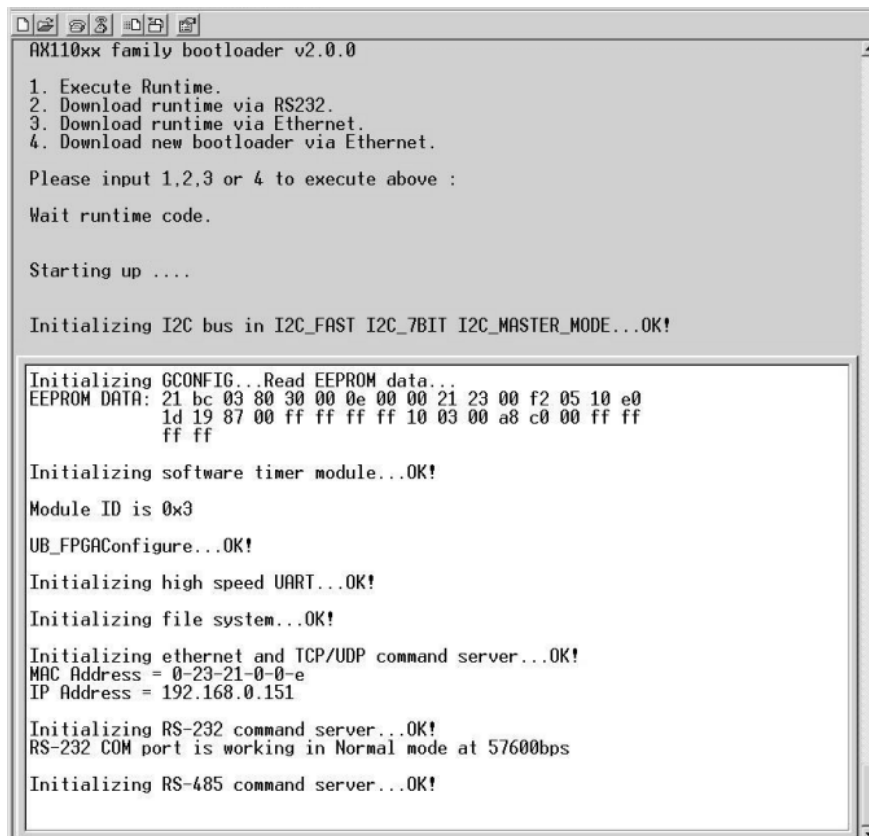
Figure A-1 Set “Baud Rate” and “Mode” for COM A

A.2 Setting the HyperTerminal's COM Port

- Step 1. Click **Start**→**All Programs**→**Accessories**→**Communications**→**HyperTerminal** to startup the Windows® HyperTerminal function.
- Step 2. Set the HyperTerminal's COM port to the following settings (same as Avitech module's RS-232 port setting):
 - ✓ Baud Rate = 57600
 - ✓ Data Bits = 8
 - ✓ Parity = None
 - ✓ Stop Bits = 1
 - ✓ Flow Control = None

A.3 Entering the ASCII Z Command Interface

Step 1. Connect the HyperTerminal's COM port (computer) to the Titan 8000 / Rainier 4U/4U1V RS-232 port, and make sure that power supply is available. The default baud rate (57600 bps) must be used to transmit the startup signal.



```

AX110xx family bootloader v2.0.0

1. Execute Runtime.
2. Download runtime via RS232.
3. Download runtime via Ethernet.
4. Download new bootloader via Ethernet.

Please input 1,2,3 or 4 to execute above :

Wait runtime code.

Starting up ....

Initializing I2C bus in I2C_FAST I2C_7BIT I2C_MASTER_MODE...OK!

Initializing GCONFIG...Read EEPROM data...
EEPROM DATA: 21 bc 03 80 30 00 0e 00 00 21 23 00 f2 05 10 e0
               1d 19 87 00 ff ff ff ff 10 03 00 a8 c0 00 ff ff
               ff ff

Initializing software timer module...OK!
Module ID is 0x3
UB_FPGAConfigure...OK!
Initializing high speed UART...OK!
Initializing file system...OK!
Initializing ethernet and TCP/UDP command server...OK!
MAC Address = 0-23-21-0-0-e
IP Address = 192.168.0.151

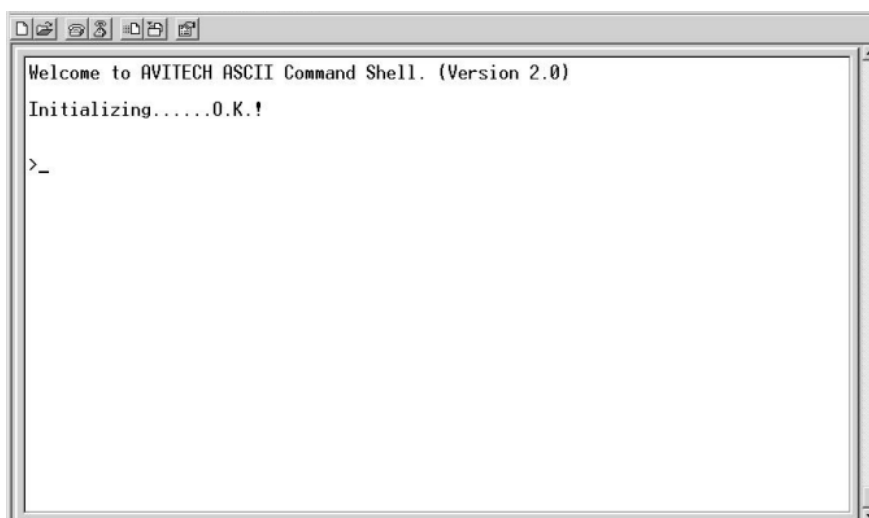
Initializing RS-232 command server...OK!
RS-232 COM port is working in Normal mode at 57600bps

Initializing RS-485 command server...OK!

```

Figure A-2 Initializing

Step 2. Press **Enter** to login to the ASCII Z command interface. When the HyperTerminal's command prompt ">" symbol appears, start entering ASCII Z commands.



```

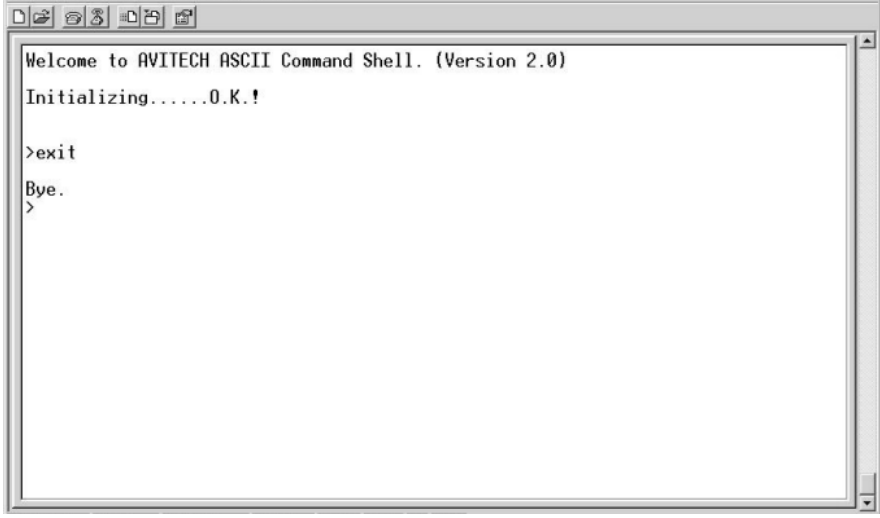
Welcome to AVITECH ASCII Command Shell. (Version 2.0)
Initializing.....O.K.!

>_

```

Figure A-3 Press "Enter" to Login

Step 3. To logout of the ASCII Z command interface, type **exit** and press **Enter**.



```
Welcome to AVITECH ASCII Command Shell. (Version 2.0)
Initializing.....O.K.!

>exit
Bye.
>
```

Figure A-4 Type “exit” and Press “Enter” to Logout