PROGRAMMING INSTRUCTIONS

Programming the Trimble Acutime 360 GPS Antenna with the STR modules

Summary: Unlike the older models of the Trimble antennas, the Acutime 360 smart antenna is no longer compatible out of the box. This Tech note outlines the required steps to ensure the latest Acutime 360 antenna works properly with the Cyber Sciences STR-100.

Note: The 360 antenna is available in two part numbers, Standard (106406-00) and GPS Only (106406-05). Cyber-Sciences can preprogram the GPS-Only model (106406-05). It is also field programmable by an installer using these instructions. The Standard Model (106406-00) will not work with the STR-100.

Note: Setup is not required for Acutime 360 Smart Antennas purchased directly from Cyber Sciences. We have performed this step before shipping it out of our factory.

Introduction

The Cyber Sciences STR modules (STR100 and STR-100/IRIG-B) have been tested with the Trimble Acutime GG GPS antenna as well as its predecessors, Acutime Gold and Acutime 2000. Since then, Trimble has discontinued these models and replaced them with the Acutime 360 antenna. Changes in the design of this antenna has also changed its compatibility with the STR modules. This document describes how to eliminate these issues for the application to work reliably.

Wiring:

All wiring for the three models of Trimble smart antennas (Gold/GG/360 GPS-Only) is the same and should be wired per the Instruction Bulletin (IB-STR-01R4) which may be found at the following link:

https://www.cyber-sciences.com/documents/IB-STR-01_STR-100_Users_Guide.pdf.

Required Software and Hardware:

Trimble Acutime 360 Starter Kit with cable (106222-00) comes with an Interface Module that is required for programming an Acutime antenna. Trimble VTS software is also required and may be found on Trimble's website at the following link:

https://www.trimble.com/timing/lab-kit.aspx

Setup

1. Use the Serial Interface box Trimble includes with the Acutime 360 Starter kit. Follow the starter kit instructions to connect the antenna to a PC and open the Trimble VTS software. The Interface box will appear as two serial ports in the VTS software as seen below.

👺 Trimble Visual Timing Studio

New Connection New Idle Connection Auto-detect USB Serial Port (COM16) USB Serial Port (COM17) Refresh COM List Device Manager	Version 2.03.12	🔎 Connect to Device 💌	New Connection ~	🔽 Data Logger [
USB Serial Port (COM16) USB Serial Port (COM17) Refresh COM List Device Manager			New Connection New Idle Connection Auto-detect	1
Refresh COM List Device Manager			USB Serial Port (COM16) USB Serial Port (COM17)	
Device Manager			Refresh COM List	
			Device Manager	

 Through the interface box , connect to Port B. Port B, is normally the second port listed in the "New Connection" drop down menu and must be used to change settings. Once connected, the following screen will appear:

12.05.12	Connect to Device	• New Cor	nection				\sim	🛃 Data	Logger 🔛 Dat	a Converter 🦉	Prefere	ences 🗿 Exit				
Acutime	360 Monitor [COM 17]	1		PO Filmentova			o] (3	Timing Rece	eiver Status and Co	ntrol [CO]	M 17]				
Monitor	🔹 🖗 Receiver 👻 🖸	COM 17 V	AUTO QUERY: ON	🛛 🔝 Map					🍥 Menu 👻							
Time [GPS	1	Receiver I	lode & Status	Sa	tellite	Data	1.116	100	GPS Status			Status				
Time	Wed 19:18:02	Mode	3-D, Auto (0 SV)	5	V C	/No	Az.	Elev.	Self-Survey P	rogress: 1%		🔵 Antenna Open				
Date	January 02, 2019	Status	no satellites usable		2 1	9.0	0.0	0.0	Pour Mode:	(0) Automatic (2D	(3D)	🔵 Antenna Short				
Week	2034 TOW 328682	Almanac	not complete & currer	nt 🦻	4 2	5.0	0.0	0.0	revisioner		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	O Satellite Tracking				
Velocity	Velocity		Status						GPS Status:	Vs	O Survey Complete					
East	m/s	PDOP	BBRAM	0					Timing		O Stored Position					
North	m/s	HDOP	RTC	○ [1 f			Bias [*]	0.00	ns	Lean Second Pendir				
Up	m/s	VDOP	ANT	ок					Dias.	0.00		Test Mode				
Speed	mille	TDOP	Osc (ppb	2					bias kate:	0.00	ppo					
speed	1 100/1	IDOP				1			PPS Quant Err	ror: -0.0	ns					
Position		Firmware	Info						Miccellaneous							
Latitude		Application	1 1.04.0 04/03/	18					Priscellaneous	·		PPS Generated				
Longitude		Monitor P	rotocols			- í	-		UTC Offset:	0 secor	nds					
Altitude	m HAE	In TS	P Out TSIP					-	Temperature:	38.18 °C						

Monitor 🔻	🕞 Re	ceiver 🕶 🛛 CO	M 17 V	AUTO Q	UERY: ON	🛛 Map 📗			
Time [GPS]	22	Configure		le & Sta	atus	Sate	llite Data	a .	1538
Time	@ s	Save Configurati	00	3-D, A	Auto (0 SV)	SV	C/No	Az.	Elev
Date		-		no sate	ellites usable	74	28.0	0.0	0.0
Week 20	(Jutput	•	ot comp	lete & current				
Velocity East North Up Speed Position Latitude		Cold Reset Warm Reset Hot Reset More Resets nitialize Get from Receive Load A-GPS Data	Ctrl+O Ctrl+W Ctrl+H • •	Fo 1.04.0	Status BBRAM O RTC O ANT OF Osc (ppb)				
		-		1.04.0	1 0-105/15				
		<u>. </u>	Monitor Pro	tocols		-			
Altitude		m HAE	In TSIP	Ou	t TSIP 🗸 🗸				

 In the new window, go to the following drop down menu, Receiver > Configure

 When the Configure window appears, go to the Port Configuration tab and select "Current" for the Receiver Port. It should change once you select current to Port B. If it goes to Port A, then disconnect and reconnect to the other COM port.

S Configuration	n Port Configur	ation Outputs SV Masks NMEA
Receiver Port:	Port B ~	Protocols Input: Output:
Baud Rate:	Port A Port B	
Parity:	Odd 🗸	
Data Bits:	8 ~	
Stop Bits:	1 ~	Change local COM settings to match device's port settings

5. Once you confirm you are connected to the correct port (Port B) it is time to send a configuration command. Keep the Receiver Configuration window open for saving the configuration that is about to be sent. From the Acutime360 Monitor window go to, "Monitor > Generic Packet".

🕘 Monitor 🔻 👺 Receiver 👻 🛛 CO	M 17 🗸 🗸	AUTO QU	JERY: ON	🔛 M	1ap			
 Auto Query Clear Window Generic Packets 	Receiver I Mode Status Almanac	Mode & Sta 3-D, A no satel not comple	tus uto (0 SV) lites usable ete & curre	e nt	Satel SV 74	C/No 22.0	Az.	Elev.
 View Position Map View Sky Plot View Satellite Tracking Info View GNSS System Data View Raw Data 	DOPs PDOP HDOP VDOP TDOP		Status BBRAM RTC ANT Osc (ppb	о ок)				
Timing Receiver Monitor DR Monitor Altitude m HAE	Firmware Application Monitor P In TS	Info n 1.04.0 rotocols IP Out	04/03/	/18				

6. The generic packet window will pop up. Enter "8E A5 10 00 00 00" into the Packet Data field as shown below. This command will change the format of the TSIP packets sent from the Acutime antenna to the STR module.

This featu supported have built-	re allows protoco in suppo	to send a ma l. It can be us ort in this prog	nually-form ed to test p ram.	atted packe backets that	t in any do not
1) Select t formatted	he proto :	col according	to which th	e packet will	be
Protocol:	TSIP	~	Presets:	<select></select>	~
by a space	e. Do not	t enter the sta	arting DLE a	ind trailing D	barated
by a space Do not stu	iff DLE b	t enter the sta ytes.	arting DLE a	ind trailing D	Darated

- Click "Send" and wait a few seconds, then go back to the Receiver Configuration window and click "Save Configuration" this will store the current configuration in the antenna's non-volatile flash memory.
- To verify the setup is correct, connect to the first serial COM port (Port A) with VTS and on the Acutime360 Monitor window go to, Monitor > View Raw Data

🔜 Monitor 🔻 👺 Receiver 👻	COM 16 \sim	AUTO QUERY: OFF	💭 Map 📗		
Auto Query Clear Window Generic Packets	Receiver I Mode Status Almanac	Yode & Status 3-D, Auto (0 SV) no satellites usable not complete & current	Sate SV	llite Data C/No	Az. Elev
 View Position Map View Sky Plot View Satellite Tracking Info View GNSS System Data View Raw Data 	DOPs PDOP HDOP VDOP r TDOP	Status BBRAM C RTC C ANT O Osc (ppb)			
 View Version Information Timing Receiver Monitor DR Monitor Altitude mH² 	Firmware Application Monitor P	Info 1 1.04.0 04/03/18 rotocols IP Out TSIP			

9. The Raw Data Monitor window will pop up and you will see TSIP packets being sent from the Acutime antenna once a second, the packets should all start with "10 8F AD" as shown in the figure below.

۲	Mer	iu	Show	: 🗹	RX		TX	P	acket	ID's	Ú) Pa	use	C	Сор	y	o d	ear								
LO	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	16	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	17	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	18	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	19	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	1A	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	18	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	1C	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	1D	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	1E	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	1F	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	20	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	21	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	22	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	23	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	24	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	25	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	26	02	01	07	E3	07	00	FF	FF	10	03	
0	8F	AD	00	00	00	00	00	00	00	00	00	00	14	1A	27	02	01	07	E3	07	00	FF	FF	10	03	

- If your monitor is showing commands that start with "10 8F AB", try the process one more time. Once "10 8F AD" packets are seen, the process is complete. If it continues to show "10 8F AB", please call Cyber-Sciences technical support at 615-890-6709 for assistance.
- 11. Now, you can disconnect from the antenna within the VTS software and install the Acutime 360 antenna as normal with a STR-100 or STR-100/IRIG. **Note, preforming a

Factory Reset command from the STR-100 or STR-100/IRIG will return the Acutime 360 antenna back to its default settings and it will need to be reprogrammed with this process to work correctly with the STR-100 or STR-100/IRIG.

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