

Acorn Instrument API					ver 0.3	
Black Oak Engineering					6-Dec-24	
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Precision Electronic Instruments						
				Recent changes		
Used in:	Bee, BlueJay, Monarchs, Wren, environmental controllers, etc.					
General:	<p>Acorn was developed by Black Oak Engineering as a simple, general purpose, human readable, efficient communications data layer for test instruments & controllers. It must be compact enough to fit into small MCUs. Other protocols such as SCPI do not meet these criteria.</p> <p>Shown here is typical case of Host & Device.</p> <p>General syntax rule is that a cmd triplet requires a control character (=, ?, +, -, *) then a possible argument.</p> <p>The protocol can be network-ized by appending a numerical index to each command triplet.</p> <p>For example, 'aqr2=100ms' addresses cmd aqr to device with index 2. Index 0 is the Host.</p> <p>By default, every command is echo responded with upper case as shown. Echo can be turned off.</p> <p>If there is a problem with a cmd, error text is returned as 'CMD!...'. Error message text should be plain and succinct.</p> <p>In general physical units must always be appended when applicable.</p> <p>Default buffer length is 41 bytes. There is a cmd to ask what is your buffer length.</p> <p>Single quotes are part of syntax; they denote strings with possible spaces.</p> <p>Baudrate 115200 8N1 is default. Lines terminated with CR/LF. There is a cmd to alter this.</p>					
License:	<p>Released under MIT License.</p> <p>Acorn API is not intended for life support functions.</p> <p>No warranty is made as to its suitability for any particular application.</p>					
Triplet	Syntax	Description, example		Typical response		Note
Data acquisition						
aqv	aqv?3	What is the voltage on Channel 3? Channel 0 is default.		AQV3=24.567V		[mV, V]
aqr	aqr=100ms	Set sample rate to 100 ms.		AQR=100ms		[us, ms, sec]
				AQR='SR too Fast'		
	aqr?			AQR=100ms		
aqd	aqd=1200hr	Set sample duration to 1200 hrs.				[sec, min, hr, day]
	aqd?					
aqm	aqm=0	Set acquisition mode. Instrument specific.				
	aqm?	There must be verbiage from device explaining any special modes.		AQM=0, 'Interleaved samples'		
aq	aq=10	Number subsamples to average		AQA=10		
	aq?			AQA=10		

aqs	aqs?	What is std dev of last sample set? Relevant units.	AQS=0.1234V	
Device				
dvc	dvc?	Basic AT cmd	DVC='Bee'	Type of device.
did	did='Boiler Room'	Device identity	DID='Boiler Room'	
	did?			
dci	dci=3,'Boiler temp oC'	Device channel ID.	DCI!'No such channel'	A device may support multiple msmt channels.
	dci?	List all channel names defined.		
dre	dre+	Reset system.	DRE?	
	dre='Y'	Required within 1 sec.		
dmo	dmo?	Model number.	DMO='BE-BLUJ'	
dbv	dbv?	Battery voltage.	DBV=3.789V	
dte	dte?	Internal temperature.	DTE=25.0oC	
dta	dti='07/18/24 14:22:00'	Set time. Registers 1 sec after last byte.		
	dti?	What is system time?		
dst	dst?	Give most timely status/error message text.	DST=0080h, 'Busy'	
	dst=0080h-	Clear that bit.	DST=0080h-	
deh	deh?	Error hex code, which requires concordance to parse.	DEH=00A3h	-h
dvf	dvf?	What is your firmware version?	DVF='1.0.1'	
dvh	dvh?	What is your hardware version?	DVH='1.3a'	
dvl	dvl?	What is your license number?	DVL='Undefined'	
dva	dva?	What is your Acorn API version?	DVA='1.0'	
dsn	dsn?	What is your serial number?	DSN='12345'	
dsp	dsp=0	Execute special cmd for instrument.	DSP=0	
	dsp?	List short descriptions of all special cmds.		
dsl	dsl='100ms,2min'	Sleep mode is wake for 100ms, then sleep for 2min.	DSL='100ms,2min'	
	dsl-	Disable sleep mode.		
Logging				
log	log=1+	Start logging channel 1 now.		[+ -]
lra	lra=100ms	Set log rate to 100 ms.	LRA=100ms	[ms, sec, min, hr]
lfm	lfm?	How much free memory is left?	LFM=12000Sa	[Sa, kB, MB]
lcl	lcl+	Clear log memory	LCL?	

	lcl='Y'	Required within 1 sec.		
	Calibration			
bts	bts*	Temperature cal series	BTS=20, '-20.0:85.0oC'	Device indicates that it has 20 cal points roughly equidistant over range.
	bts=0, '-19.87oC'	Datum 0 is ready. This continues for the 20 cal points, whereupon process terminates with save.	BTS!0, 'Out of range'	If exception occurs device-side, terminate.
	bts-	Terminate cal without save.		
bph	bph=7.02pH	Cal pH point	BPH=7.02pH	
bda	bda='Temp,05/30/24'	Store cal date	BDA='Temp, 05/30/24'	
	bda?'Temp'	What date is stored for Temp cal?		
	bda?	List your calibration type strings.	'Temp', 'pH'	
	Control			
cto	cto+1	Control output #1 on.	CTO+1	
cti	cti?2	What is control input #2?	CTI+2	
csp	csp=0, 40.0oC	Set point for controller #0 is 40.0 oC.	CSP=0, 40.0oC	Temperature control.
			CSP+	Stability reached, asynchronously, if asynch enabled (mas).
			CSP! 'Response timeout'	Asynchronous exception.
	Communications			
mec	mec-	Disable device cmd echo	MEC-	Acknowledge disable then shut up.
mbr	mbr=15200	Baud rate.	MBR=15200	Device goes immediately to that baud rate and then echoes with that.
mas	mas+	Enable asynchronous messages from Device. Eg, alarms, errors. Default is off.	MAS+	[+ -]
mfs	mfs='com-cr-lf'	Output format specifier.		[com cr lf] What exactly is a CSV format can vary.
mb1	mb1?	What is your comms buffer length in bytes?		

mco	mco+1	Turn on off Chan #1 serial output dump.	MCO+1, 2sec	[ms, sec, min, hr] Response includes the reporting rate. If possible this is the acquisition rate; how the max possible.
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