Hemisphere®

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S321 Series Command Interface

Reference Manual

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This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

This product complies with the essential requirements and other relevant provisions of Directive 2014/53/EU. The declaration of conformity may be consulted at https://hgnss.com/About-Us/Quality-Commitment.

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6397147	7142956	7429952	8018376	8217833	2002325645
6469663	7162348	7437230	8085196	8265826	2004320401
6501346	7277792	7460942	8102325	8271194	
6539303	7292185	7689354	8138970	8307535	
6549091	7292186	7808428	8140223	8311696	
6711501	7373231	7835832	8174437	8334804	
6744404	7388539	7885745	8184050	RE41358	
6865465	7400294	7948769	8190337		

Other U.S. and foreign patents pending.

Notice to Customers

Contact your local dealer for technical assistance. To find the authorized dealer near you:

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Contents

Overview

The purpose of this document is to summarize the command system for the S321 GNSS Receiver. This document is intended to provide complete instructions for an integrator.

Command System

The S321 command structure is separated into two categories: GET/SET commands and LOG commands. GET/SET commands are for configuring the receiver or querying the current configurations and LOG commands are for turning on NMEA 0183 messages or proprietary messages (ASCII and binary). The S321 configurations are organized into various ‘nodes’ (see section below).

Nodes

A node is a collection of attributes and operations. For example, the GNSS node contains the configurations of the GNSS engine whereas the NETWORK node contains network settings (TCP/IP or NTRIP configurations). For example, Elevation Mask is a property of the GNSS engine and so to access this you would use GNSS.ELE_MASK. Nodes are also sometimes organized into sub-nodes. For example, base station settings are stored in the “GNSS.BASE” node. To set the Base Station ID, you would use “GNSS.BASE.SITE_ID.”

GET/SET Commands

Command	Description
SET	Set the value of an attribute or start an operation
GET	Return the value of an attribute
GETALL	Return all attribute values of the node. The result of this command is the same as sending multiple “GET” commands for all attributes of the node branch (including nodes under the specified node)

LOG Commands

Command	Description
LOG	Setup the output of the specified message.
UNLOG	Turn off a specific message.
UNLOGALL	Turn off all messages (output the receiver)

Separators

- A carriage return/linefeed must be sent after a command. In this document, carriage return/linefeed is represented by “\r\n”
- A comma is used a separator between a command and its parameters
- A period is used as a separator between node branches
- If the parameter of a command or a return field of an output message contains multiple values, they are separated by “|”.

Checksum

The command response (including automatic status output) uses a CRC8 checksum for message integrity check. The polynomial used is 0x07. The calculation is from the first character of the message(“@”) to the last character before “*” (which is right before checksum value).

Command Description

SET

Command Structure：
SET,<PATH>,<VALUE>\r\n
<PATH>：Path of attribute. E.g. GNSS.INIT.
<VALUE>：Value of attribute. If the value contains comma, then this value must be surround by double quotation marks（”）.

SET is used to change the value of attributes or start an operation.

Return:
@GNSS,SET,<PATH>,<VALUE>,OK [,<TYPE>]*CRC8\r\n

GET

Command Structure：
GETALL,<NODE>\r\n

GETALL

Command Structure：

GETALL,<NODE>\r\n

GETALL lists all attribute values including those of sub-nodes. For ease to parse, the return formation is the same with GET but multiple lines.

Return:

@GNSS,GET,<PATH>,OK,<VALUE1>*CRC8\r\n

@GNSS,GET,<PATH>,OK,<VALUE2>*CRC8\r\n

@GNSS,GET,<PATH>,OK,<VALUE3>*CRC8\r\n…..

LOG

Command Structure：
LOG,<MSG_TYPE>,[TRIGGER],[INTERVAL]\r\n

This command outputs NMEA0183 messages or select proprietary messages

MSG_TYPE values can be: GGA, ZDA, GST, GSV, GSA, GGQ, GGK, GLL, GNS, RMC, VTG, D1, BIN3 and BIN5.
TRIGGER values can be ONCE, ONTIME
INTERVAL(Only applicable when TRIGGER is ONTIME) values can be 20HZ, 10HZ, 5HZ, 2HZ, 1HZ, 2S(2 seconds), 5S, 10S, 30S and 60S. e.g. For GPGGA message at every 1 second：LOG,GGA,ONTIME,1HZ\r\n

UNLOG

Command Structure：
UNLOG,<MSG_TYPE>\r\n

This command stops the output of select messages.

MSG_TYPE values can be GGA, ZDA, GST, GSV, GSA, GGQ, GGK, GLL, GNS, RMC, VTG, D1, BIN3 and BIN5.
E.g. to stop GPGGA output: UNLOG,GGA\r\n

UNLOGALL

Command Structure：
UNLOGALL \r\n
This command stops the output of all messages over Bluetooth, serial port, or SD card.

System Output

Command Response

Response Structure：
@GNSS,<COMMAND>,OK[,<VALUE>…] *CRC8\r\n
Or
@GNSS,<COMMAND>,ERROR,DETAIL *CRC8\r\n

The preamble is @GNSS and the command sent is included directly after the preamble.

If the command was accepted, the S321 will respond with “OK” e.g.:
@GNSS, <COMMAND>,OK,1*CRC8\r\n

If the command was not accepted (such as an unknown command), the S321 will respond with “ERROR” e.g.:
@GNSS, <COMMAND>,ERROR,1*CRC8\r\n

NMEA Output

The GNSS engine uses standard NMEA 0183 messages.

System Status Output

The system status may output without a command on following occasions:

1) The system status is changed by using another interface (e.g. from panel)
2) The system outputs a message to a data controller
3) A system error occurs or an additional warning is needed

Node Description

Device Node

The DEVICE node contains attributes and operations of the device

DEVICE.INFO.SERIAL			
Support GET	YES	Support SET	NO
Description	Receiver serial number		
Parameters			
Default			
Note			

DEVICE.INFO.MODEL			
Support GET	YES	Support SET	NO
Description	Receiver model		
Parameters			
Default			
Note			

DEVICE.INFO.HARDWARE_VER			
Support GET	YES	Support SET	NO
Description	Receiver hardware version		
Parameters			
Default			
Note			

DEVICE.INFO.BIOS_VER			
Support GET	YES	Support SET	NO
Description	Receiver bios version		
Parameters			
Default			
Note			

DEVICE.INFO.FIRMWARE_VER			
Support GET	YES	Support SET	NO
Description	Receiver firmware version		
Parameters			
Default			
Note			

DEVICE.INFO.OS_VER			
Support GET	YES	Support SET	NO
Description	Receiver system version		
Parameters			
Default			
Note			

DEVICE.INFO.MCU_VER			
Support GET	YES	Support SET	NO
Description	Receiver MCU firmware version		
Parameters			
Default			
Note			

DEVICE.INFO.MANUFACTURE_DATE			
Support GET	YES	Support SET	NO
Description	Manufacture date e.g. 2011/07/18		
Parameters			
Default			
Note			

DEVICE.INFO.GPSBOARD			
Support GET	YES	Support SET	NO
Description	Model of GNSS board		
Parameters			
Default			
Note			

DEVICE.RECORD.STATUS			
Support GET	YES	Support SET	NO
Description	Recording status, returns 05XX codes		
Parameters			
Default			
Note	See Error Codes		

DEVICE.RECORD.INTERVAL			
Support GET	YES	Support SET	YES
Description	data logging interval.		
Parameters	20HZ,10HZ,5HZ,1HZ,2S,5S,10S,30S,60S		
Default	1HZ		
Note	20HZ is available depending on receiver activations		

DEVICE.RECORD.POINTNAME			
Support GET	YES	Support SET	YES
Description	Point name		
Parameters	Maximum 128 characters		
Default			
Note	The point name will be the name of the raw data file.		

DEVICE.RECORD.PDOP_THRESHOLD			
Support GET	YES	Support SET	YES
Description	PDOP threshold for automatic logging		
Parameters	value between 1 and 99.9		
Default	3.5		
Note	Logging will not automatically start if PDOP exceeds this threshold. The receiver can still log if configured manually		

DEVICE.RECORD.AUTO_REC			
Support GET	YES	Support SET	YES
Description	If yes, start logging after startup if in static mode		
Parameters	YES/NO		
Default			
Note			

DEVICE.RECORD.STARTRECORD			
Support GET	NO	Support SET	YES
Description			
Parameters			
Default			
Note			

DEVICE.RECORD.STOPRECORD			
Support GET	NO	Support SET	YES
Description			
Parameters			
Default			
Note			

DEVICE.RECORD.INSERT			
Support GET	NO	Support SET	YES
Description	This command will insert the text message inside parameter field into the raw data logging file.		
Parameters	Text to be logged		
Default			
Note	An error will return if no logging session is ongoing.		

DEVICE.RECORD.MARKER_START			
Support GET	NO	Support SET	YES
Description	Start a static session in raw data logging file		
Parameters	empty		
Default			
Note	Only valid in rover raw data recording		

DEVICE.RECORD.MARKER_STOP			
Support GET	NO	Support SET	YES
Description	Stop the static session.		
Parameters	Empty		
Default			
Note	Only valid in rover raw data recording		

DEVICE.RECORD.MARKER_INFO			
Support GET	NO	Support SET	YES
Description	Marker name and marker number separated by |. If the marker number is not specified, use the same value as marker name		
Parameters	point1|00001		
Default			
Note			

DEVICE.RECORD.MARKER_CANCEL			
Support GET	NO	Support SET	YES
Description	Cancel the static session		
Parameters	empty		
Default			
Note			

DEVICE.RTK.STATUS			
Support GET	YES	Support SET	NO
Description			
Parameters	return 06XX codes		
Default			
Note	Refer to Error Codes Table		

DEVICE.RTK.RECORD_RAW			
Support GET	YES	Support SET	YES
Description	If yes, start logging after startup if in base/rover mode		
Parameters	YES/NO		
Default			
Note			

DEVICE.RTK.TXDATA			
Support GET	YES	Support SET	NO
Description	Transmit data counter in bytes. Reset when datalink changes.		
Parameters			
Default			
Note			

DEVICE.RTK.RXDATA			
Support GET	YES	Support SET	NO
Description	Receive data counter in bytes. Reset when datalink changes.		
Parameters			
Default			
Note			

DEVICE.BATTERY_ID.			
Support GET	YES	Support SET	NO
Description	The serial number of battery		
Parameters			
Default			
Note			

DEVICE.STATUS.			
Support GET	YES	Support SET	NO
Description	Receiver status		
Parameters			
Default			
Note			

DEVICE.SYS_MODE.			
Support GET	YES	Support SET	YES
Description	Receiver operation mode		
Parameters	STATIC/BASE/ROVER		
Default			
Note			

DEVICE.ANT_HEIGHT.			
Support GET	YES	Support SET	YES
Description	The distance between the bottom of receiver to the ARP. The unit is millimeters.		
Parameters	VALUE BETWEEN -30000 AND 30000(UNIT MM)		
Default	1000		
Note			

DEVICE.AVAILABLE_DATALINK.			
Support GET	YES	Support SET	NO
Description	Available datalink Mode		
Parameters	NETWORK|UHF|EXT|BLUE|NO_DATALINK		
Default			
Note			

DEVICE.CUR_DATALINK.			
Support GET	YES	Support SET	YES
Description	Current datalink		
Parameters	NETWORK/UHF/EXT/BLUE/ NO_DATALINK		
Default			
Note			

DEVICE.CUR_LANGUAGE.			
Support GET	YES	Support SET	YES
Description	Current language		
Parameters	ENGLISH/CHINESE		
Default			
Note			

DEVICE.POWER_SOURCE.			
Support GET	YES	Support SET	NO
Description	Power source type		
Parameters	BATTERY/EXTERNAL		
Default			
Note			

DEVICE.POWER_LEVEL.			
Support GET	YES	Support SET	NO
Description	Power level		
Parameters	PERCENTAGE VALUE FROM 0% TO 100%		
Default			
Note			

DEVICE.RESET.			
Support GET	YES	Support SET	NO
Description	Restart		
Parameters			
Default			
Note	Reboots the receiver		

DEVICE.POWER_OFF.			
Support GET	NO	Support SET	YES
Description	Command to shut off receiver		
Parameters			
Default			
Note			

DEVICE.STARTBASE.			
Support GET	NO	Support SET	YES
Description	Start base station		
Parameters			
Default	Only in base mode		
Note	Only in base mode		

DEVICE.STOPBASE.			
Support GET	NO	Support SET	YES
Description	Stop base station		
Parameters			
Default			
Note	Only in base mode		

DEVICE.TIMEZONE.			
Support GET	YES	Support SET	YES
Description	System time zone		
Parameters			
Default	8		
Note			

DEVICE.BEEP.			
Support GET	NO	Support SET	YES
Description	beep		
Parameters			
Default			
Note	Receiver will beep for one second		

DEVICE.FRESET.			
Support GET	NO	Support SET	YES
Description	Reset Receiver to factory settings		
Parameters			
Default			
Note	Reset the S321 to factory defaults. **All UHF channels will be removed from the radio and a channel table will need to be re-uploaded**. Firmware versions remain unchanged.		

GNSS Node

GNSS.INFO.SERIAL			
Support GET	YES	Support SET	NO
Description	Returns the electronic serial number (ESN) of the internal GNSS board		
Parameters			
Default			
Note			

GNSS.INFO.MODEL			
Support GET	YES	Support SET	NO
Description	GNSS board model		
Parameters	P306		
Default			
Note			

GNSS.INFO.FIRMWARE_VER			
Support GET	YES	Support SET	NO
Description	GNSS firmware version		
Parameters			
Default			
Note			

GNSS.INFO.MANUFACTURE_DATE			
Support GET	YES	Support SET	NO
Description	GNSS board manufacturing date		
Parameters			
Default			
Note			

GNSS.INFO.FUNCTIONALITY			
Support GET	YES	Support SET	NO
Description	GNSS activations		
Parameters			
Default			
Note	Returns subscriptions and activations on GNSS board		

GNSS.BASE.POSITION			
Support GET	YES	Support SET	YES
Description	Setup or read the position setting for base station		
Parameters	SINGLE/REPEAT,Lon|Lat|Hgh		
Default	SINGLE		
Note	SET,GNSS.BASE.POSITION,REPEAT, -111.8954190|33.643332|455.090 For SET command, no position needed after "SINGLE" type For GET command, if base is transmitting, then the current position is output – even for "SINGLE" type		

GNSS.BASE.AVAILABLE_DIFF_TYPE			
Support GET	YES	Support SET	NO
Description	Available differential protocols		
Parameters			
Default			
Note			

GNSS.BASE.DIFF_TYPE			
Support GET	YES	Support SET	YES
Description	Differential protocol name		
Parameters	RTCM2 RTCM3 CMR CMRPLUS ROX		
Default	RTCM3		
Note			

GNSS.BASE.SITE_ID			
Support GET	YES	Support SET	YES
Description	Base station ID		
Parameters	If set to empty, the default value will be used		
Default	The last three numbers of the S321 serial number		
Note	Should be defined after setting DIFFTYPE because different protocols have different policies on site ID		

GNSS.BASE.PDOP_THRESHOLD			
Support GET	YES	Support SET	YES
Description	If the S321 is configured as a base station and configured to start automatically after powerup, the base station will not start transmitting until the PDOP is less than this value.		
Parameters	value between 1 and 99.9		
Default	3.5		
Note			

GNSS.BASE.DELAY_START			
Support GET	NO	Support SET	YES
Description	Base station auto start restrain. Start regardless of pdop after some time The maximum number of seconds an S321 will wait before beginning to transmit as a base station (regardless if PDOP threshold has been met or not)		
Parameters	Numeric value in seconds		
Default	60		
Note			

GNSS.BASE.AUTO_BASE			
Support GET	YES	Support SET	YES
Description	If set to YES, start base station with previous settings when in base mode		
Parameters	YES/NO		
Default			
Note			

GNSS.REFSTATION.LON			
Support GET	YES	Support SET	NO
Description	Reference station longitude		
Parameters			
Default			
Note	Returns the longitude (in decimal degrees) of the reference station that the rover is receiving RTK from. If the S321 is not configured as a rover or is not receiving RTK, this value will be null		

GNSS.REFSTATION.LAT			
Support GET	YES	Support SET	NO
Description	Reference station latitude		
Parameters			
Default			
Note	Returns the latitude (in decimal degrees) of the reference station that the rover is receiving RTK from. If the S321 is not configured as a rover or is not receiving RTK, this value will be null		

GNSS.REFSTATION.HEIGHT			
Support GET	YES	Support SET	NO
Description	Reference station height		
Parameters			
Default			
Note	Returns the height (in meters) of the reference station that the rover is receiving RTK from. If the S321 is not configured as a rover or is not receiving RTK, this value will be null		

GNSS.REFSTATION.ID			
Support GET	YES	Support SET	NO
Description	Reference station ID		
Parameters			
Default			
Note	Returns the ID of the reference station. If the S321 is not configured as a rover or is not receiving RTK, this value will be null		

GNSS.REFSTATION.AGE			
Support GET	YES	Support SET	NO
Description	Differential age in seconds		
Parameters			
Default			
Note			

GNSS.ELE_MASK.			
Support GET	YES	Support SET	YES
Description	Satellite elevation constrain in RTK solution		
Parameters	numeric value 0-45		
Default	5		
Note			

GNSS.POSITION.LON			
Support GET	YES	Support SET	NO
Description	GPS longitude		
Parameters			
Default			
Note	Longitude returned in decimal degrees		

GNSS.POSITION.LAT			
Support GET	YES	Support SET	NO
Description	GPS latitude		
Parameters			
Default			
Note	Latitude returned in decimal degrees		

GNSS.POSITION.HEIGHT			
Support GET	YES	Support SET	NO
Description	GPS height		
Parameters			
Default			
Note	Height returned in meters		

GNSS.POSITION.TYPE			
Support GET	YES	Support SET	NO
Description	GPS quality indicators		
Parameters	0/1/2/4/5/7		
Default			
Note			

GNSS.DOP.PDOP			
Support GET	YES	Support SET	NO
Description	Returns PDOP value		
Parameters			
Default	N/A		
Note			

GNSS.DOP.HDOP			
Support GET	YES	Support SET	NO
Description	Returns HDOP value		
Parameters			
Default	N/A		
Note			

GNSS.DOP.VDOP			
Support GET	YES	Support SET	NO
Description	Returns VDOP value		
Parameters			
Default			
Note			

GNSS.TIME.GPSTIME			
Support GET	YES	Support SET	NO
Description	Hour:Minute:Second		
Parameters			
Default			
Note			

GNSS.TIME.GPSDATE			
Support GET	YES	Support SET	NO
Description	Year-Month-Day		
Parameters			
Default			
Note			

GNSS.RESET.			
Support GET	NO	Support SET	YES
Description	Command to reset OEM board		
Parameters	SOFT/HARD		
Default			
Note	SOFT: Resets the internal GNSS receiver to its default operating parameters. The S321 carrier board will still reconfigure the board per the settings in the WebUI HARD: Does everything that SOFT does, plus clears the almanac, clears the use of the real-time clock at startup, clears the use of backed-up ephemeris and almanacs, and reboots the GNSS board		

GNSS.GLONASS.			
Support GET	YES	Support SET	YES
Description	Enable/Disable GLONASS		
Parameters	ENABLE/DISABLE		
Default			
Note			

GNSS.BEIDOU.			
Support GET	YES	Support SET	YES
Description	Enable/Disable BEIDOU		
Parameters	ENABLE/DISABLE		
Default			
Note			

GNSS.SBAS.			
Support GET	YES	Support SET	YES
Description	Enable/Disable SBAS		
Parameters	ENABLE/DISABLE		
Default			
Note			

GNSS.RTKTIMEOUT.			
Support GET	YES	Support SET	YES
Description	Sets the length of time an RTK correction will be used by the GNSS receiver before RTK is dropped		
Parameters	Number in seconds		
Default	30		
Note			

GNSS.RTKRESET.			
Support GET	NO	Support SET	YES
Description	Reset RTK filter		
Parameters			
Default			
Note			

GNSS.DISABLEPRN.			
Support GET	NO	Support SET	YES
Description	Disable the specified PRN		
Parameters	Satellite PRN with constellation indicator Example: G1, R11, C15		
Default			
Note	The constellation indicators are as follows: G for GPS; R for GLONASS; C for Beidou; E for Galileo		

GNSS.ENABLEALLPRN.			
Support GET	NO	Support SET	YES
Description	Enable all PRNs		
Parameters			
Default			
Note	Enable all satellites on currently enabled constellations For example, if "SET,GNSS.GLONASS,DISABLE" then sending this command will not activate GLONASS PRNs.		

GNSS.COMMAND.			
Support GET	NO	Support SET	YES
Description	Send the parameter to the GNSS board		
Parameters	e.g. "$JI"		
Default			
Note	This command will directly send its parameters to the GNSS board. However, responses are not shown.		

L-band Node

LBAND.ENABLE.			
Support GET	YES	Support SET	YES
Description	Enable L-band or aRTK		
Parameters	YES/NO		
Default			
Note			

LBAND.FREQ.			
Support GET	YES	Support SET	NO
Description	L-band frequency in KHz		
Parameters			
Default			
Note			

LBAND.BAUD.			
Support GET	YES	Support SET	NO
Description	L-band baud rate in bps		
Parameters	600 only		
Default			
Note			

LBAND.SATID.			
Support GET	YES	Support SET	NO
Description	L-band satellite ID		
Parameters			
Default			
Note			

LBAND.TYPE.			
Support GET	YES	Support SET	NO
Description	L-band type		
Parameters	AUTO/MANUAL		
Default			
Note			

LBAND.CONFIG.			
Support GET	NO	Support SET	YES
Description	Set L-band config		
Parameters	AUTO/MANUAL|FREQ|BAUD		
Default			
Note			

Radio Node

RADIO.INFO.SERIAL			
Support GET	YES	Support SET	NO
Description	Radio module serial number		
Parameters			
Default			
Note			

RADIO.INFO.MODEL			
Support GET	YES	Support SET	NO
Description	Radio module model		
Parameters			
Default			
Note			

RADIO.INFO.HARDWARE_VER			
Support GET	YES	Support SET	NO
Description	Radio module hardware version		
Parameters			
Default			
Note			

RADIO.INFO.FIRMWARE_VER			
Support GET	YES	Support SET	NO
Description	Radio module firmware version		
Parameters			
Default			
Note			

RADIO.MODE.			
Support GET	YES	Support SET	YES
Description	Radio transmission protocol selection		
Parameters	Numeric value . 0 SATEL 2 PC1 12 PC5 11 TrimTalk1 3 TrimTalk2 1 PCC 4FSK		
Default			
Note	Only works when UHF is the current datalink. Otherwise returns "NOT SUPPORTED IN CURRENT MODE"		

RADIO.STATUS.			
Support GET	YES	Support SET	NO
Description	Radio module status e.g. 0300 for OK		
Parameters			
Default			
Note			

RADIO. CALLSIGN.			
Support GET	YES	Support SET	YES
Description	Call sign setting. This is requested in certain countries.		
Parameters	0 1|5|message		
Default	0		
Note	To turn off call sign feature: SET,RADIO.CALLSIGN,0 To enable call sign feature: SET,RADIO.CALLSIGN,1|1|test Only supported with "SATEL" protocol		

Network Node

NETWORK.INFO.SERIAL			
Support GET	YES	Support SET	NO
Description	Network module serial number		
Parameters			
Default			
Note			

NETWORK.INFO.MODEL			
Support GET	YES	Support SET	NO
Description	Network module		
Parameters			
Default			
Note			

NETWORK.INFO.HARDWARE_VER			
Support GET	YES	Support SET	NO
Description	Network module hardware version		
Parameters			
Default			
Note			

NETWORK.INFO.FIRMWARE_VER			
Support GET	YES	Support SET	NO
Description	Network module firmware version		
Parameters			
Default			
Note			

NETWORK.INFO.IMEI			
Support GET	YES	Support SET	NO
Description	Network module IMEI		
Parameters			
Default			
Note			

NETWORK.LOCAL_IP.			
Support GET	YES	Support SET	NO
Description	Local IP address after connecting to a network. Four zeros if not connected		
Parameters			
Default			
Note			

NETWORK.BASE_NUMBER.			
Support GET	YES	Support SET	YES
Description	Base station phone number.		
Parameters			
Default			
Note			

NETWORK.LOCAL_SP.			
Support GET	YES	Support SET	NO
Description	Service provider name. Empty if not connected		
Parameters			
Default			
Note			

NETWORK.STATUS.			
Support GET	YES	Support SET	NO
Description	Module status		
Parameters			
Default			
Note			

NETWORK.ERRORCODE.			
Support GET	YES	Support SET	NO
Description	Returns the error code for network module.		
Parameters			
Default			
Note	Records the last error code from network operation. Check the "Code" tag for details. This output will automatically pop up if a "GET,NETWORK.STATUS" is sent and the status is one of "0432,0434,0436"		

NETWORK.SIGNAL_LEVEL.			
Support GET	YES	Support SET	NO
Description	Signal strength in percentage.		
Parameters	Percentage value from 0 TO 100		
Default			
Note			

NETWORK.MODE.			
Support GET	YES	Support SET	YES
Description	Connection mode selection		
Parameters	CSD/PPP/NTRIP		
Default			
Note	PPP for IP network point to point connection (LINK);NTRIP for IP network NTRIP server connection.		

NETWORK.ADDR.			
Support GET	YES	Support SET	YES
Description	Server Address (domain or IP)		
Parameters			
Default			
Note	SET,NETWORK.ADDR,72.46.141.153		

NETWORK.PORT.			
Support GET	YES	Support SET	YES
Description	Server port		
Parameters	Numeric value		
Default			
Note	SET,NETWORK.PORT,6060		

NETWORK.APN.			
Support GET	YES	Support SET	YES
Description	APN name		
Parameters			
Default			
Note	SET,NETWORK.APN,CMNET		

NETWORK.APNUSER.			
Support GET	YES	Support SET	YES
Description	APN username		
Parameters			
Default			
Note			

NETWORK.APNPASS.			
Support GET	YES	Support SET	YES
Description	APN password		
Parameters			
Default			
Note			

NETWORK.MOUNTPOINT.			
Support GET	YES	Support SET	YES
Description	Mountpoint name		
Parameters			
Default			
Note			

NETWORK.MOUNTPOINTUSERPASS.			
Support GET	YES	Support SET	YES
Description	Mountpoint username and password. Separated by "|"		
Parameters			
Default			
Note	SET,NETWORK.MOUNTPOINTUSERPASS,USER|PASSWD		

NETWORK.RESET.			
Support GET	NO	Support SET	YES
Description	Reset the network module		
Parameters			
Default			
Note	Only changes in APN will trigger a network module reset. Other setting changes do not need a module reset.		

NETWORK.MOUNTPOINTLIST.			
Support GET	YES	Support SET	NO
Description	List Mountpoint list		
Parameters			
Default			
Note			

NETWORK.RECONNECT.			
Support GET	NO	Support SET	YES
Description	Disconnect and connect using current setting		
Parameters			
Default			
Note			

NETWORK.DISCONNECT.			
Support GET	NO	Support SET	YES
Description	Disconnect		
Parameters			
Default			
Note			

NETWORK.AUTO_CONNECT.			
Support GET	YES	Support SET	YES
Description	If YES, connect to server using current setting; if NO, only connect to network after network datalink chosen and wait for manual server connection		
Parameters	YES/NO		
Default			
Note			

NETWORK.UPLOADGGA.			
Support GET	YES	Support SET	YES
Description	Upload a GGA message to an NTRIP network at the rate specified in the parameter. Set to 0 to disable this		
Parameters	1, 5, 10, 15, 30, 60 (seconds)		
Default			
Note	If set the 5, a GGA message will be sent to the network every 5 seconds		

NETWORK.CSD_PROTOCOL.			
Support GET	YES	Support SET	YES
Description	Communication protocol for CSD call		
Parameters	ISDN110 ANALOG		
Default	ANALOG		
Note			

NETWORK.CSD_SPEED.			
Support GET	YES	Support SET	YES
Description	CSD call data transfer rate		
Parameters	2400 4800 9600 14400		
Default	9600		
Note			

NETWORK.CSD_TYPE.			
Support GET	YES	Support SET	YES
Description	CSD call connection element		
Parameters	TRANSPARENT NON_TRANSPARENT		
Default	TRANSPARENT		
Note			

External Node

EXTERNAL.BAUD.			
Support GET	YES	Support SET	YES
Description	Setup the baud rate for 5-pin serial port		
Parameters	9600,19200,38400,57600,115200		
Default			
Note			

DISK Node

DISK.PREFERED.			
Support GET	YES	Support SET	YES
Description	Preferred storage device		
Parameters	INTERNAL/SDCARD		
Default	INTERNAL		
Note	Select the preferred storage device		

DISK.TYPE.			
Support GET	YES	Support SET	NO
Description	Currently used storage device		
Parameters	INTERNAL/SDCARD		
Default			
Note	Returns the currently used storage device		

DISK.INT_FREESPACE.			
Support GET	YES	Support SET	NO
Description	Returns the INTERNAL free space value in Kbytes		
Parameters			
Default			
Note			

DISK.INT_TOTALSPACE.			
Support GET	YES	Support SET	NO
Description	Returns the INTERNAL total space value in Kbytes		
Parameters			
Default			
Note			

DISK.SD_FREESPACE.			
Support GET	YES	Support SET	NO
Description	Returns the MicroSD free space value in Kbytes		
Parameters			
Default			
Note	Empty if no SD card is inside of the receiver		

Bluetooth Node

BLUETOOTH.MODEL.			
Support GET	YES	Support SET	NO
Description	Bluetooth module model		
Parameters			
Default			
Note			

SENSOR Node

SENSOR.INFO.MODEL			
Support GET	YES	Support SET	NO
Description	Sensor module model		
Parameters			
Default			
Note			

SENSOR.INFO.HARDWARE_VER			
Support GET	YES	Support SET	NO
Description	Sensor module hardware version		
Parameters			
Default			
Note			

SENSOR.INFO.FIRMWARE_VER			
Support GET	YES	Support SET	NO
Description	Sensor module firmware version		
Parameters			
Default			
Note			

SENSOR.FREQUENCY.			
Support GET	YES	Support SET	YES
Description	Data output interval in Hz		
Parameters	0/1/5/10/20		
Default			
Note			

Error Codes

00XX Indicates command interface errors	
0001	Incorrect command
0002	Incorrect path
0003	Unsupported command on path
0004	Unsupported command in current mode.
0005	Incorrect argument
0006	Command failed
0007	Previous command under process
0008	Command is not supported in current model
01XX Indicates device errors	
0101	Disk initialization error
0102	Measurement engine initialization error
0103	Radio initialization error
0104	GPRS module error
0110	Registration error
0111	Registration expired
0120	Logging in progress; cannot start new logging
0121	Positioning requirement not met
0122	No logging in progress
02XX Indicates file system errors	
0201	Disk error
0202	File initiation error
0203	File system not ready
0204	File does not exist
0205	Path does not exist
0206	Invalid file name
0207	Operation denied
0208	File already exists
0209	Invalid file object
0210	Write protected
0211	Invalid drive
0212	File system disabled
0213	No filesystem
0214	Format aborted
0215	Operation timed out
0216	File system locked
0217	Not enough space
0218	Too many open files

03XX Indicates UHF radio errors	
0300	Radio OK
0301	Unsupported radio
0302	Radio initialization failed
0303	Radio is not ready
0304	Pending a command process
0305	Command timeout
0306	Command error
0307	Unknown command
0308	Buffer overflow
0309	Error transmitting
0310	Task error
0311	Frequency out of range
04XX Indicates GPRS module errors or status	
0401	GPRS initiation error
0402	GPRS is not ready
0403	SIM card is not ready
0404	GPRS network error
0405	GPRS register error
0406	Command in process
0407	Command error
0408	Unknown command
0409	Connecting server
0410	Error connecting server
0411	Connection timeout
0412	Error sending data
0413	GPRS network not ready
0414	SMS error
0415	SETMODE failed
0416	SETMODE error
0417	No Mount Point List available
0418	Connected
0419	Reconnect
0420	NTRIP unauthorized
0421	Mount Point not accepted
0422	Network roaming forbidden
0423	Network busy
0430	Module initiating
0431	Module ready
0432	Module initiation fail
0433	Establishing connection
0434	Connection fail
0435	Socket connected

0436	Protocol error
0437	Transferring
0438	User disconnected
0440	Module off
05XX Indicates raw data logging status	
0501	No data logging
0502	In data logging
0503	Waiting to start data logging
0507	Error when logging data.
0508	Upgrade needed for 10Hz/20Hz rate
0509	PDOP requirement no reach
0510	File name invalid
0601	Base mode pending to start
0602	Base mode transmitting
0603	Base mode stopped
0604	Rover single
0605	Rover fix
0610	PDOP threshold not met when base started
0611	Empty antenna type
0612	Calibration file not found
0613	Unknown antenna type
1XXX Indicates OS errors	
1001	OS timeout.
1002	Mailbox full.
1003	Queue full.
1004	Queue empty.
1005	OS memory full.
1010	Operation timeout.

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