SUNCQ Protocol

Commands

The following lists all commands from TNC to host and vica-versa. The command reservations are:

- 0x00 to 0x2F Host-to-TNC DO commands
- 0x30 to 0x5F Host-to-TNC SET commands
- 0x60 to 0x7F Host-to-TNC GET commands
- 0x80 to 0x9F TNC-to-Host STATUS replies
- 0xA0 to 0xCF TNC-to-Host DATA replies
- 0xD0 to 0xFE Reserved
- 0xFF Invalid

Code	Name	Function	Payload	Bytes	Comments
0x00	RESET	Reset the system	-	0	
0x01	CALIBRATE	Calibrate the system	-	0	Full calibration e.g. ground station and all sub-systems
0x02	RETURN_TO_START	Return the system to its starting state.	-	0	The starting state is post-calibration.
0x03	RETURN_TO_STOW	Return the system to its stow state.			The stow state is pre-calibration. Typically used before system shutdown
0x30	SET_TNC_MODE	Enter a TNC mode	See *TNC_MODE*	1	
0x31	SET_TRACK_MODE	Set tracking mode	See *TRACK_MODE*	1	
0x32	SET_PATH_DATA	Upload flight path data	CSV file. See *Flight Path Data.*	Any	The payload length is provided as the first 8 bytes.
0x33	SET_POINT_DIRECTION	Set the direction that the mount should point at			Only applicable when no tracking mode is selected
0x60	GET_SIGNAL_RSSI	Get RSSI of the signal	-	0	
0x61	GET_LOCATION	Get location of the ground station	Lat;Lng;Alt (f32;f32;f32)	12	
0x80	TNC_STATUS	Sent by the TNC as an ACK or status alert.	See *STATUS_CODE.*	1	Status 0x00 is used as an “ACK” command.
0x81	TNC_MESSAGE	Sent by the TNC to communicate a String message to the host.	char[]	Any	A newline character terminates the message
0xA0	SIGNAL_RSSI	Response to *GET_SIGNAL_RSSI*	float	4	
0xD0-0xFE	RESERVED	Reserved			Reserved for future use
0XFF	INVALID	Invalid			For internal use

Details

TNC_MODE

Value	Description
0x00	Normal mode
0x01	KISS mode. This mode is exited using the KISS 0xFF command.

TRACK_MODE

The tracking mode is a combination flag i.e. multiple bits can be ORed together to specify that the payload must be tracked using multiple methods at once.

Value	Description
0x00	No tracking. Mount can be moved by setting the pointing vector.
0x01	Use uploaded GPS data
0x02	Use received GPS data (from payload)
0x04	Use signal strength, but only for an initial scan
0x08	Use signal strength, with dynamic conical scanning

STATUS_CODE

The following is a list of status codes that might be sent from the TNC to the host:

Value	Description
0x00	Acknowledge
0x01	Payload tracking unsuccessful/payload lost

Flight path data

Flight path data can be uploaded in the form of a little-endian binary stream (i.e. each field should be least significant byte first). The first field is a 2-byte number indicating the number of flight path instances to follow. Then, the fields below should be provided. Such a file can be generated by predicting a flight path at https://predict.sondehub.org/ , generating a CSV file, and then using the data to generated a binary stream. In the current implementation, only 200 entries are catered for – if longer flights are needed, then multiple streams should be set from the host intermittently. Time should be in Unix time (seconds since Epoch).

Name	Type
Time	uint64
Latitude	float32
Longitude	float32
Altitude	float32