**WINTER CS: REMOTE COMMAND SET**    **jwb 31 March 2021**

**PROTOCOL DESCRIPTION**

The remote client applies for a TCP stream connection to the command server on Port 62000. Machines on the private net use address 10.200.98.100. Public network access to be determined.

Once a channel is opened, the client can send ASCII command strings to the command server. A command packet consists of the command name (upper or lower case) followed by space-delimited parameters as specified below. The command is terminated with a newline ('\n') or carriage return ('\r') character.

*Responses are as follows:*

Information Commands return ASCII strings with the requested information.

Operational Commands return

"0" if the command succeeds,

"-1" if the command is unknown,

"-2" if a parameter is bad,

"-3" if the command cannot be executed at the current time,

"-5" if the command was aborted, and

"-6" if the remote interface does not have control.

In all cases the command server appends a null character ('\0') to responses so the client can detect the end of the string.

Null commands (terminator only) are treated as unrecognized and return "-1".

**USAGE NOTES**

The WINTER CS remote commands are listed below. Any command that affects dome operation (in general, all except Information Commands) requires that the remote client have control to operate (see the *TAKECONTROL* command below).

Commands are categorized as FAST or SLOW, indicating whether the command returns a completion status or information string immediately.

Multiple connections may be opened on IP port 62000, allowing one channel to monitor status while another executes operations.

**INFORMATION COMMANDS**

***STATUS?*** returns various status items in JSON format

*(No parameters):*

UTC - %04d-%02d-%02d %02d:%02d:%06.3f\n  
Telescope\_Power – On, Off  
Dome\_Azimuth – Degrees  
Dome\_Status – OFF, STOPPED, HOMING, MOVING, STOWED, SUNTRACK, UNKNOWN  
Home\_status – READY, NOT\_READY (see Home command)  
Shutter\_Status – OPEN, OPENING, CLOSED, CLOSING, STOPPED, UNKNOWN  
Control\_Status – MANUAL, CONSOLE, AVAILABLE, REMOTE  
Close\_Status – READY, NOT\_READY (Telescope Operator Close)  
Weather\_Status – READY, NOT\_READY  
Sunlight\_Status – READY, NOT\_READY  
Wetness – READY, NOT\_READY  
Outside\_Dewpoint\_Threshold – %.1f (Dome closure threshold, outside temp to dewpoint)  
Average\_Windspeed\_Threshold – %.1f (Dome closure threshold)  
Outside\_temp – %.1f  
Outside\_RH – %.1f  
Outside\_Dewpoint – %.1f  
Pressure – %.1f (mb)  
Wind\_Direction – %d  
Average\_Wind\_Speed – %.1f  
Weather\_Hold\_Time – %.1f  
Faults – %d

**Faults Field**

The faults field will hold a value indicating all faults present (unless indicated in another status field) that will prevent telescope, dome, or shutter operation. Communication lost faults are only a concern if they are persistent, due to network issues communication may be temporarily lost and re-established.

|  |  |
| --- | --- |
| **Fault** | **Code** |
| Dome Drive Communication lost | 0x1 |
| PLC Communication Lost | 0x2 |
| Weather Communication Lost | 0x4 |
| Fire Alarm | 0x8 |
| Door Open | 0x10 |
| ESTOP | 0x20 |
| Drive Over Temp | 0x40 |
| Drive Internal Voltge | 0x80 |
| Drive Over Voltage | 0x100 |
| Drive Over Current | 0x200 |
| Drive Motor Open Winding | 0x400 |
| Drive Bad Encoder | 0x800 |

**CONTROL-PASSING COMMANDS**

***TAKECONTROL*** *(FAST)* requests that the command server control be given to remote interface. Fails if *?STATUS* item Control\_Status is not AVAILABLE or IP address is not authorized.

*(No parameters)*

***GIVECONTROL*** (FAST) returns control to command server console.

*(No parameters)*

**DOME SHUTTER COMMANDS**

***CLOSE*** (SLOW) closes dome shutters. The maintenance key switch must be in auto for this command to execute. Emergency switch aborts or prevents operation.

*(No parameters)*

***OPEN*** (SLOW) opens dome shutters if the sun is down, weather conditions do not exceed thresholds, and the P200 Telescope Operator is not commanding dome closure. (Note that if any of these conditions becomes invalid, an asynchronous close can occur at any time.) *?STATUS* item Telescope\_Power\_Status must be READY for this command to work.

*(No parameters)*

**DOME CONTROL COMMANDS**

***GODOME*** (SLOW) sends the dome to the requested azimuth.

*Parameter:*

*(1) Dome destination azimuth in degrees, 0-360.*

***HOME*** (SLOW) rotates dome until the home positions is found and resets the dome azimuth. Status field “Home\_Status” indicates if a dome home is needed. If the dome drive is powered off a home command must be executed before observing.

*(No parameters)*

***STOP*** (FAST) stops all dome motion. Dome motion will be restored by *GODOME* commands.

*(No parameters)*