ProjectSoft®

Astronomical institute of the Czech Republic

Commands for TCS

ASCOL Protocol

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CONTENT

1 ASCOL protocol

ASCOL protocol is used to control the telescope and is based on TCP protocol. IP address of the control computer is 192.168.132.11 and it is listening on ports 2000 to 2009. On one port can be only one connection.

Each command is sent as ASCII succession of characters terminated by character CR (0x0D). Answers are also terminated by CR. After a successful login can be used all active commands and commands for set parameters. Only queries commands are active without login. If the client station does not send command for a period of 2 minutes or client station sends 100 characters and more without termination CR, control computer terminates the connection. If bad command or bad parameter is received control computer responds ERR <CR>.

ASCOL (AStronomical COmmunication Language) is a low-level communication protocol used to command directly the Telescope Control System (TCS). It is intended to be very simple and to convey everything that is needed for controlling the telescope and the observation itself.

Protocol is TCP-based and transmits ASCII characters. TCS has the IP address 192.168.132.11 and is listening on ports 2000 to 2009. Due to the limitation of the TCS, only one connection is allowed on one port.

Each command is a simple sequence of ASCII characters terminated by the CR (0x0D) character. Answers returned by the TCS are also always terminated by the CR character.

If the client does not send command for a period of 2 minutes or sends more than 100 characters without the termination character, TCS terminates the connection. If the TCS receives correct command it answers by the requested value(s) or at least by character ‘1’ (0x31). In case of receiving invalid command TCS answers ERR.

2 ASCOL quires

2.1 GLVE (Global Version)

Input:
None

Output:
Type (%1d)
Version (%1d)
Subsystems (%1d)

Description:

Example:

GLVE<CRLF>
1 2 29<CRLF>

2.2 GLLG (Global LoGin)

Input:
Password (%d, 0 – 2000000000)

Output:
%1d, 0 – wrong password, 1 – correct password

Description:
Active commands are available only after authorization.

Example:

GLLG 41533148<CRLF>
1<CRLF>

2.3 GLLL (GLobal read Latitude and Longitude)

Input:
None

Output:
Latitude (%01.2f, '')
Longitude (%01.2f, '')

Description:

Example:

GLLL<CRLF>
123059.12 345.38<CRLF>

2.4 GLUT (GLobal read UTc)

Input:
None

Output:
Current UTC time as MJD date and time.

Description:

Example:

GLUT<CRLF>
50448 123059.999<CRLF>

2.5 GLSD (GLobal read SiDeral time)

Input:
None

Output:
Current local apparent sideral time (%.2f)

Description:

Example:

GLSD<CRLF>
123059.41<CRLF>

2.6 GLDP (GLobal DePartment)

Input:
None

Output:
Department (%05d)

Description:

Example:

GLDP<CRLF>
25663<CRLF>

2.7 GLTE (GLobal TEchnologist)

Input:
None

Output:
%1d, 1 – technologist, 0 – not technologist

Description:

Example:

GLTE<CRLF>
1<CRLF>

2.8 TEON (TElescope ON/off)

Input:
%d, 1 – on, 0 – off

Output:
1

Description:

Example:
TEON 1<CRLF>
1<CRLF>

2.9 TEST (TElescope STop)

Input:
None

Output:
1

Description:

Example:

TEST<CRLF>
1<CRLF>

2.10 TETR (TElescope TRack on/off)

Input:
%d, 1 – on, 0 – off

Output:
1

Description:

Example:
TETR 1<CRLF>
1<CRLF>

2.11 TEFL (Telescope FLip)

Input:
None

Output:
1

Description:

Example:

TEFL<CRLF>
1<CRLF>

2.12 TEPA (TElescope PArk)

Input:
None

Output:
1

Description:

Example:

TEPA<CRLF>
1<CRLF>

2.13 TEIN (TElescope INitialization)

Input:
None

Output:
1

Description:

Example:
TEIN<CRLF>
1<CRLF>

2.14 TESY (TElescope SYnchronization) - for backward compatibility

Input:
None

Output:
1

Description:
Same as TEIN command.

Example:

TESY<CRLF>
1<CRLF>

2.15 TSRA (Telescope Set Right ascension and declination Absolute)

Input:
Right ascension (%.1f, hhmmss.s)
Declination (%.1f, ddmmss.s)
Position (%d, 0 – East, 1 – West)

Output:
1

Description:

Example:

TSRA 120101.1 455959.9 0<CRLF>
1<CRLF>

2.16 TSHA (Telescope Set Hour and declination axis Absolute)

Input:
Hour axis angle (%.4f, -180 – 330 °)
Declination axis angle (%.4f, -90 – 270 °)

Output:
1

Description:

Example:

TSHA 60.00 60.00<CRLF>
1<CRLF>

2.17 TGRA (Telescope Go Right ascension and declination Absolute)

Input:
None

Output:
1

Description:

Example:

TGRA<CRLF>
1<CRLF>

2.18 TGHA (Telescope Go Hour and declination axis Absolute)

Input:
None

Output:
1

Description:

Example:

TGHA<CRLF>
1<CRLF>

2.19 TSCR (Telescope Set Correction of Refraction)

Input:
%d, 1 – on, 0 – off

Output:
1

Description:

Example:

TSCR 1<CRLF>
1<CRLF>

2.20 TSCM (Telescope Set Correction of telescope Model)

Input:
%d, 1 – on, 0 – off

Output:
1

Description:

Example:
TSCM 1<CRLF>
1<CRLF>

2.21 TSGM (Telescope Set Guiding Mode)

Input:
%d, 1 – on, 0 – off

Output:
1

Description:

Example:

TSGM 0<CRLF>
1<CRLF>

2.22 TSGV (Telescope Set Guiding Value)

Input:
Right ascension (%.1f, ")
Declination (%.1f, ")

Output:
1

Description:

Example:

TSGV 1.1 2.2<CRLF>
1<CRLF>

2.23 TSGR (Telescope Set Guiding value Relative)

Input:
Right ascension (%.2f, ")
Declination (%.2f, ")

Output:
1

Description:

Example:

TSGR 1.11 2.22<CRLF>
1<CRLF>

2.24 TSS1 (Telescope Set Speed 1)

Input:
Speed 1 (%.2f, "/s)

Output:
1

Description:

Example:

TSS1 4000.01<CRLF>
1<CRLF>

2.25 TSS2 (Telescope Set Speed 2)

Input:
Speed 2 (%.2f, "/s)

Output:
1

Description:

Example:

TSS1 120.00<CRLF>
1<CRLF>

2.26 TSS3 (Telescope Set Speed 3)

Input:
Speed 3 (%.2f, "/s)

Output:
1

Description:

Example:

TSS1 10.00<CRLF>
1<CRLF>

2.27 TRGV (Telescope Read Guiding Value)

Input:
None

Output:
Right ascension (%04.1f, ")
Declination (%04.1f, ")

Description:

Example:

TRGV<CRLF>
1.1 2.2<CRLF>

2.28 TRS1 (Telescope Read Speed 1)

Input:
None

Output:
Speed 1 (%04.2f, "/s)

Description:

Example:

TRS1<CRLF>
4000.01<CRLF>

2.29 TRS2 (Telescope Read Speed 2)

Input:
None

Output:
Speed 2 (%04.2f, "/s)

Description:

Example:

TRS1<CRLF>
120.00<CRLF>

2.30 TRS3 (Telescope Read Speed 3)

Input:
None

Output:
Speed 3 (%04.2f, "/s)

Description:

Example:

TRS1<CRLF>
10.00<CRLF>

2.31 TRRD (Telescope Read Right ascension and Declination)

Input:
None

Output:
Right ascension (%.2f, hhmmss.ss)
Declination (%.2f, ddmmss.ss)
Position (%1d, 0 – East, 1 – West)

Description:

Example:

TRRD<CRLF>
235912.10 -102312.43 0<CRLF>

2.32 TRHD (Telescope Read Hour and Declination axis angle)

Input:
None

Output:
Hour axis angle (%3.4f, °)
Declination axis angle (%3.4f, °)

Description:

Example:

TRHD<CRLF>
-180.9000 55.7890<CRLF>

2.33 TERS (TElescope Read State)

Input:
None

Output:
State (%02d, 0 – switched off, 1 – switching off, 2 – switching on 1, 3 – switching on 2, 4 – ready, 5 – sky track, 6 – mechanical slew, 7 – sky slew, 8 – mechanical flip, 9 – sky flip, 10 – parking, 11 – parking, 12 - initializing)

Description:

Example:

TRRS<CRLF>
04<CRLF>

2.34 DOSA (DOme Set Absolute position)

Input:
Absolute position (%.2f, 0 – 359.99 °)

Output:
1

Description:

Example:

DOSA 65.43<CRLF>
1<CRLF>

2.35 DOGA (DOme Go Absolute position)

Input:
None

Output:
1

Description:

Example:

DOGA<CRLF>
1<CRLF>

2.36 DOAM (DOme AutoMated)

Input:
None

Output:
1

Description:

Example:

DOAM<CRLF>
1<CRLF>

2.37 DOPA (DOme PArk)

Input:
None

Output:
1

Description:

Example:

DOPA<CRLF>
1<CRLF>

2.38 DOIN (DOme INitialization)

Input:
None

Output:
1

Description:

Example:

DOIN<CRLF>
1<CRLF>

2.39 DOCA (DOme CAlibration) - for backward compatibility

Input:
None

Output:
1

Description:

Example:

DOCA<CRLF>
1<CRLF>

2.40 DOSO (DOme Slit Open/close)

Input:
%d, 1 – open, 0 – close

Output:
1

Description:

Example:
DOSO 1<CRLF>
1<CRLF>

2.41 DOST (DOme STop)

Input:
None

Output:
1

Description:

Example:

DOST<CRLF>
1<CRLF>

2.42 DORA (DOme Read Absolute position)

Input:
None

Output:
Absolute position (%3.2f, 0 – 359.99 °)

Description:

Example:

DORA<CRLF>
089.01<CRLF>

2.43 DOPO (DOme read absolute POsition) – for backward compatibility

Input:
None

Output:
Absolute position (%3.2f, 0 – 359.99 °)

Description:

Example:

DOPO<CRLF>
089.01<CRLF>

2.44 DOMI (DOme read MInimum position)

Input:
None

Output:
Absolute position (%3.2f, 0 °)

Description:

Example:

DOMI<CRLF>
000.00<CRLF>

2.45 DOMA (DOme read MAximum position)

Input:
None

Output:
Absolute position (%3.2f, 359.99 °)

Description:

Example:

DOMA<CRLF>
359.99<CRLF>

2.46 DORS (DOme Read State)

Input:
None

Output:
State (0 – stopped, 1 – slew -, 2 – slew +, 3 – auto, 4 – auto -, 5 – auto +, 6 – manual -, 7 – manual +, 8 – parking, 9 – parking -, 10 – parking +, 11 - initializing)

Description:

Example:

DORS<CRLF>
03<CRLF>

2.47 FCOP (Flap Cassegrain OPen/close)

Input:
%d, 1 – open, 0 – close

Output:
1

Description:

Example:
FCOP 1<CRLF>
1<CRLF>

2.48 FCST (Flap Cassegrain STop)

Input:
None

Output:
1

Description:

Example:

FCST<CRLF>
1<CRLF>

2.49 FCRS (Flap Cassegrain Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – opening, 2 – closing, 3 – open, 4 – closed)

Description:

Example:

FCRS<CRLF>
03<CRLF>

2.50 FMOP (Flap Mirror OPen/close)

Input:
%d, 1 – open, 0 – close
Output:
1

Description:

Example:
FMOP 1<CRLF>
1<CRLF>

2.51 FMST (Flap Mirror STop)

Input:
None
Output:
1

Description:

Example:

FMST<CRLF>
1<CRLF>

2.52 FMRS (Flap Mirror Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – opening, 2 – closing, 3 – open, 4 – closed)

Description:

Example:

FMRS<CRLF>
04<CRLF>

2.53 WASP (Wheel A Set Position)

Input:
Position (%d, 0 - 7)

Output:
1

Description:

Example:

WASP 2<CRLF>
1<CRLF>

2.54 WAGP (Wheel A Go Position)

Input:
None

Output:
1

Description:

Example:

WAGP<CRLF>
1<CRLF>

2.55 WAST (Wheel A STop)

Input:
None

Output:
1

Description:

Example:

WAST<CRLF>
1<CRLF>

2.56 WARP (Wheel A Read Position)

Input:
None

Output:
Position (%1d, 0 – 8, 8 – between positions)

Description:

Example:

WARP<CRLF>
4<CRLF>

2.57 WANP (Wheel A read Number of Positions)

Input:
None

Output:
Number of positions (%1d, 8)

Description:

Example:

WANP<CRLF>
8<CRLF>

2.58 WARS (Wheel A Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – positioning +, 2 – positioning -, 3 – positioning, 4 - locked)

Description:

Example:

WARS<CRLF>
04<CRLF>

2.59 WBSP (Wheel B Set Position)

Input:
Position (%d, 0 - 6)

Output:
1

Description:

Example:

WBSP 5<CRLF>
1<CRLF>

2.60 WBGP (Wheel B Go Position)

Input:
None

Output:
1

Description:

Example:

WBGP<CRLF>
1<CRLF>

2.61 WBST (Wheel B STop)

Input:
None

Output:
1

Description:

Example:

WBST<CRLF>
1<CRLF>

2.62 WBRP (Wheel B Read Position)

Input:
None

Output:
Position (%1d, 0 – 7, 7 – between positions)

Description:

Example:

WBRP<CRLF>
5<CRLF>

2.63 WBNP (Wheel B read Number of Positions)

Input:
None

Output:
Number of positions (%1d, 7)

Description:

Example:

WBNP<CRLF>
7<CRLF>

2.64 WBRS (Wheel B Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – positioning +, 2 – positioning -, 3 – positioning, 4 - locked)

Description:

Example:

WBRS<CRLF>
04<CRLF>

2.65 FOSA (FOcus Set Absolute position)

Input:
Absolute position (%.2f, mm)

Output:
1

Description:

Example:

FOSA 5.67<CRLF>
1<CRLF>

2.66 FOSR (FOcus Set Relative position)

Input:
Relative position (%.2f, mm)

Output:
1

Description:

Example:

FOSR -4.32<CRLF>
1<CRLF>

2.67 FOMR (FOcus Move Relative position) – for backward compatibility

Input:
Relative position (%.2f, mm)

Output:
1

Description:

Example:

FOMR -4.32<CRLF>
1<CRLF>

2.68 FOGA (FOcus Go Absolute Position)

Input:
None

Output:
1

Description:

Example:

FOGA<CRLF>
1<CRLF>

2.69 FOGR (FOcus Go Relative Position)

Input:
None

Output:
1

Description:

Example:

FOGR<CRLF>
1<CRLF>

2.70 FOAT (FOcus Apply Temperature correction)

Input:
None

Output:
1

Description:

Example:

FOAT<CRLF>
1<CRLF>

2.71 FOST (FOcus STop)

Input:
None

Output:
1

Description:

Example:

FOST<CRLF>
1<CRLF>

2.72 FORA (FOcus Read Absolute position)

Input:
None

Output:
Absolute position (%2.2f, mm)

Description:

Example:

FORA<CRLF>
22.33<CRLF>

2.73 FOPO (FOcus read absolute POsition) – for backward compatibility

Input:
None

Output:
Absolute position (%2.2f, mm)

Description:

Example:

FOPO<CRLF>
22.33<CRLF>

2.74 FOMI (FOcus read MInimum position)

Input:
None

Output:
Minimum position (%2.2f, mm)

Description:

Example:

FOMI<CRLF>
01.00<CRLF>

2.75 FOMA (FOcus read MAximum position)

Input:
None

Output:
Maximum position (%2.2f, mm)

Description:

Example:

FOMA<CRLF>
54.00<CRLF>

2.76 FOTC (FOcus read Temperature Correction)

Input:
None

Output:
Temperature correction (%2.2f, mm)

Description:

Example:

FOTC<CRLF>
-07.89<CRLF>

2.77 FORS (FOcus Read State)

Input:
None

Output:
State (0 – stopped, 1 – positioning, 2 – positioning, 3 – manual -, 4 – manual +)

Description:

Example:

FORS<CRLF>
00<CRLF>

2.78 MCSA (Movable Carriage Set Absolute position)

Input:
Absolute position (%.3f, mm)

Output:
1

Description:

Example:

MCSA 12.345<CRLF>
1<CRLF>

2.79 MCGA (Movable Carriage Go Absolute position)

Input:
None

Output:
1

Description:

Example:
MCGA<CRLF>
1<CRLF>

2.80 MCPA (Movable Carriage PArk)

Input:
None

Output:
1

Description:

Example:

MCPA<CRLF>
1<CRLF>

2.81 MCIN (Movable Carriage INitialization)

Input:
None

Output:
1

Description:

Example:
MCIN<CRLF>
1<CRLF>

2.82 MCST (Movable Carriage STop)

Input:
None

Output:
1

Description:

Example:

MCST<CRLF>
1<CRLF>

2.83 MCRA (Movable Carriage Read Absolute position)

Input:
None

Output:
Absolute position (%3.3f, mm)

Description:

Example:

MCRA<CRLF>
001.234<CRLF>

2.84 MCMI (Movable Carriage read MInimum position)

Input:
None

Output:
Minimum position (%3.3f, mm)

Description:

Example:

MCMI<CRLF>
1.000<CRLF>

2.85 MCMA (Movable Carriage read MAximum position)

Input:
None

Output:
Maximum position (%3.3f, mm)

Description:

Example:

MCMA<CRLF>
319.000<CRLF>

2.86 MCRS (Movable Carriage Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – positioning, 2 – manual -, 3 – manual +, 4 – parking, 5 – initializing -, 6 – initializing +)

Description:

Example:

MCRS<CRLF>
0<CRLF>

2.87 AFSA (Autoguider Focus Set Absolute position)

Input:
Absolute position (%.3f, mm)

Output:
1

Description:

Example:

AFSA 34.567<CRLF>
1<CRLF>

2.88 AXSA (Autoguider X axis Set Absolute position)

Input:
Absolute position (%.3f, mm)

Output:
1

Description:

Example:

AXSA 23.456<CRLF>
1<CRLF>

2.89 AYSA (Autoguider Y axis Set Absolute position)

Input:
Absolute position (%.3f, mm)

Output:
1

Description:

Example:

AYSA 23.456<CRLF>
1<CRLF>

2.90 AMSP (Autoguider Mirror Set Position)

Input:
Position (%d, 1 – position 1, 2 – position 2)

Output:
1

Description:

Example:

AMSP 1<CRLF>
1<CRLF>

2.91 AWSP (Autoguider Wheel Set Position)

Input:
Position (%d, 0 - 5)

Output:
1

Description:

Example:

AWSP 3<CRLF>
1<CRLF>

2.92 ACON (Autoguider Camera ON/off)

Input:
%d, 1 – on, 0 – off

Output:
1

Description:

Example:
ACON 1<CRLF>
1<CRLF>

2.93 AFGA (Autoguider Focus Go Absolute position)

Input:
None

Output:
1

Description:

Example:
AFGA<CRLF>
1<CRLF>

2.94 AXGA (Autoguider X axis Go Absolute position)

Input:
None

Output:
1

Description:

Example:

AXGA<CRLF>
1<CRLF>

2.95 AYGA (Autoguider Y axis Go Absolute position)

Input:
None

Output:
1

Description:

Example:
AYGA<CRLF>
1<CRLF>

2.96 AWGP (Autoguider Wheel Go Position)

Input:
None

Output:
1

Description:

Example:
AWGP<CRLF>
1<CRLF>

2.97 AGPA (AutoGuider PArk)

Input:
None

Output:
1

Description:

Example:
AGPA<CRLF>
1<CRLF>

2.98 AGIN (AutoGuider INitialization)

Input:
None

Output:
1

Description:

Example:
AGIN<CRLF>
1<CRLF>

2.99 AGST (AutoGuider STop)

Input:
None

Output:
1

Description:

Example:

AGST<CRLF>
1<CRLF>

2.100 AFRA (Autoguider Focus Read Absolute position)

Input:
None

Output:
Absolute position (%2.3f, mm)

Description:

Example:

AFRA<CRLF>
12.345<CRLF>

2.101 AFMI (Autoguider Focus read MInimum position)

Input:
None

Output:
Minimum position (%2.3f, mm)

Description:

Example:

AFMI<CRLF>
01.000<CRLF>

2.102 AFMA (Autoguider Focus read MAximum position)

Input:
None

Output:
Maximum position (%2.3f, mm)

Description:

Example:

AFMA<CRLF>
89.000<CRLF>

2.103 AXRA (Autoguider X axis Read Absolute position)

Input:
None

Output:
Absolute position (%3.3f, mm)

Description:

Example:

AXRA<CRLF>
012.345<CRLF>

2.104 AXMI (Autoguider X axis read MInimum position)

Input:
None

Output:
Minimum position (%3.3f, mm)

Description:

Example:

AXMI<CRLF>
001.000<CRLF>

2.105 AXMA (Autoguider X axis read MAximum position)

Input:
None

Output:
Maximum position (%3.3f, mm)

Description:

Example:

AXMA<CRLF>
319.000<CRLF>

2.106 AYRA (Autoguider Y axis Read Absolute position)

Input:
None

Output:
Absolute position (%3.3f, mm)

Description:

Example:

AYRA<CRLF>
012.345<CRLF>

2.107 AYMI (Autoguider Y axis read MInimum position)

Input:
None

Output:
Minimum position (%3.3f, mm)

Description:

Example:

AYMI<CRLF>
001.000<CRLF>

2.108 AYMA (Autoguider Y axis read MAximum position)

Input:
None

Output:
Maximum position (%3.3f, mm)

Description:

Example:

AYMA<CRLF>
319.000<CRLF>

2.109 AMRP (Autoguider Mirror Read Position)

Input:
None

Output:
Position (%1d, 1 – position 1, 2 – position 2)

Description:

Example:

AMRP<CRLF>
1<CRLF>

2.110 AWRP (Autoguider Wheel Read Position)

Input:
None

Output:
Position (%1d, 0 – 6, 6 – between positions)

Description:

Example:

AWRP<CRLF>
4<CRLF>

2.111 AWNP (Autoguider Wheel read Number of Positions)

Input:
None

Output:
Number of positions (%1d, 6)

Description:

Example:

AWNP<CRLF>
6<CRLF>

2.112 AFRS (Autoguider Focus Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – positioning, 2 – namual -, 3 – manual +, 4 – parking, 5 – initializing -, 6 – initializing +)

Description:

Example:

AFRS<CRLF>
00<CRLF>

2.113 AXRS (Autoguider X axis Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – positioning, 2 – namual -, 3 – manual +, 4 – parking, 5 – initializing -, 6 – initializing +)

Description:

Example:

AXRS<CRLF>
00<CRLF>

2.114 AYRS (Autoguider Y axis Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – positioning, 2 – namual -, 3 – manual +, 4 – parking, 5 – initializing -, 6 – initializing +)

Description:

Example:

AYRS<CRLF>
00<CRLF>

2.115 AMRS (Autoguider Mirror Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – positioning 1, 2 – positioning 2, 3 – position 1, 4 – position 2)

Description:

Example:

AMRS<CRLF>
03<CRLF>

2.116 AWRS (Autoguider Wheel Read State)

Input:
None

Output:
State (%02d, 0 – stopped, 1 – positioning -, 2 – positioning +, 3 – positioning, 4 - locked)

Description:

Example:

AWRS<CRLF>
04<CRLF>

2.117 SHOP (SHutter OPen/close)

Input:
%d, 1 – open, 0 – close

Output:
1

Description:

Example:

SHOP<CRLF>
1<CRLF>

2.118 SHRP (SHutter Read Position)

Input:
None

Output:
Position (%1d, 1 – open, 0 – closed)

Description:

Example:

SHRP<CRLF>
0<CRLF>