# This document describes how to read and write values into the register of the ACM-180-20 drive amplifier used in the ATA antennas.

## Supporting Documents:

The following documents are describing various aspects of the drive amplifier module. These documents are located at our Git Hub FrontPage repository.

* Module datasheet, 2021 datasheet and 2004 datasheet:

## Communication:

There are two ways to communicate with a drive amplifier and one way to communicate with the drive box daughter board. The first one is to use the Accelnet Module Utility it provides a read and write function. This is used to copy entire configurations from one module to another. The second one is by directly connecting to the amplifier via a serial telenet connection.

#### *Accelnet Module Utility:*

The accelnet module utility is installed on all control boxes and is used to read and write all registers of a specified module.

* ssh ataant@control
* ssh 5g
* cd ata-boxes/utils
* python3 accelnet.py -h

An example to read all parameters from the module would be:

ataant@ant5g:~/ata-boxes/utils$ python3 accelnet.py read az

An example to write all parameters from a file to the module would be:

ataant@ant5g:~/ata-boxes/utils$ python3 accelnet.py write az az-golden.dat

We ran into the problem that sometimes not all parameters were written correctly into the module. This will be improved in a newer version of the accelnet module utility. However, it is recommended to read back the values after programming and restarting the module. Then compare the registers with the file to make sure they are correct.

#### *Direct Serial Connection:*

It is possible directly connect to the serial interface of the module through the drive box daughter board. This allows to directly interact with the module. Each module, AZ and EL has an individual port.

Azimuth amplifier port: 1513

Elevation amplifier port: 1514

To connect directly to the module, follow these commands:

* ssh ataant@control
* ssh 5g
* telnet drivebox 1513

There are three main commands that are used to read write and restart the module:

|  |  |  |
| --- | --- | --- |
| Code | Command | Description |
| s | Set | Set a value of a parameter in ram or flash. |
| g | Get | Read the value of a parameter in ram or flash. |
| r | Reset | Reset the drive. |

An example to read a register from the module would be:

ataant@ant5g:~$ telnet drivebox 1513

Trying 192.168.242.2...

Connected to drivebox.

Escape character is '^]'.

g r0xab

#### *Drive Box Daughter Board Communication:*

One can also connect to the drive box daughter board and get information about the bakes and other parameters of the drive box. Note that not all functions are implemented.

To connect to the drive box daughter board, follow these commands:

* ssh ataant@control
* ssh 5g
* telnet drivebox

An example to show all functions by typing help in the command line is shown below:

ataant@ant5g:~/ata-boxes/utils$ telnet drivebox

Trying 192.168.242.2...

Connected to drivebox.

Escape character is '^]'.

help

SYNOPSIS

help [command]

DESCRIPTION

shows specific help information for daughterboard commands:

stop - immediately stop azimuth and elevation drives

getpulsefreq - get azimuth or elevation drive pulse frequency

setpulsefreq - set azimuth or elevation drive pulse frequency

getazpulsemode - get azimuth drive pulse mode

setazpulsemode - set azimuth drive pulse mode (normal or alt.)

getenable - get azimuth or elevation drive enable state

setenable - set azimuth or elevation drive enable state

(getadc) - get voltage or temp. at ADC input 1, 2, 3, or 4

getstatus - get status of brakes, azimuth limits, ...

gettime - get daughterboard date and time

getonboardtemp - read daughterboard temperature sensor

connecttomodule - connect to Accelnet module RS-232 (serial) port

reset - reset daughterboard and Accelnet modules

getsoftwareversion - get version of software stored in ip2022 flash

getiposheapstatus - show statistics for ipOS internal heap

getiposnetpagestatus - show statistics for ipOS internal netpages

help - show help information for commands

Note: commands in parentheses are not implemented

EXAMPLES

show help information for setpulsefreq command:

help setpulsefreq

OPTIONS

To read the status of the brakes use the following command.:

getstatus azbrake

on

Note that OFF means the brake is energized, allowing free motion, supplied with 24VDC. ON means that the brake is not energized and preventing free motion, not supplied with any voltage (0VDC).

## Read drive amplifier module manufacturing year:

This function is used to read out the manufacturing year of all drive amplifier that are installed in the ATA. We needed this function to debug differences between the original installed and manufactured module in 2005 and the new replaced modules in 2019 and 2021.

To read the manufacturing year of all modules installed in the ATA, follow these commands:

* ssh obs@control
* ~obs/tkoumrian/dbinfo-year.sh

The script then outputs the antenna number and az, el module manufacturing year.

If it can’t read a value it outputs the error code.

1a az: 05

1a el: 05

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2m az: 05

2m el: error: java.lang.Exception: Read timed out

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5h az: 21

5h el: 21

## Read drive amplifier module output configuration:

This function is used to read out the module register 0x70 and 0x71 of the module, which defines the configuration of output 1 and output 2. The two outputs are used to indicate an amplifier Fault condition (not implemented) and to control the brake.

To read the output configuration register for all modules installed in the ATA, follow these commands:

* ssh obs@control
* ~obs/tkoumrian/dbinfo-out.sh

The script then outputs the value stored in the flash register for each antenna and az, el module. Both register values are displayed in the same line separated by “/”. (0x70 / 0x71). If it can’t read a value it outputs the error code.

1a az: 256 4456575 / 256 16384

1a el: 512 0 / 256 16384

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5h az: 256 4456575 / 256 16384

5h el: 512 0 / 256 16384

For detailed information about the output register values and function look at section “Module output control”.

## Module output control: