# Focuser/GPS: Technical Information.

## Command Numbers:

* 1. Halt 0xff reset the focuser and halt all movement
  2. Home 0x10 move the focuser to its home position
  3. Move 0x20 move the specified number of steps at the specified resolution.
  4. Move to 0x25 move the focuser to the specified position
  5. Display On 0x30 switch the position and status display on
  6. Display Off 0x35 switch the position and status display off

## Focuser Resolution:

* 1. The focuser is set at 128 pulses per step

## Focuser Direction

* 1. If the direction is set to OUTWARD (0) the focuser will move outwards, away from the home, towards the away (48500) position
  2. If the direction is set to INWARDS (1) the focuser will move inwards, towards the home (0) position.

## Baud Rates

* 1. Focuser Controller
     1. HUB to/from Focuser Controller Serial1 38400
     2. GPS to Focuser Controller Serial3 9600

## Status

* 1. Focuser to HUB
     1. All OK 0
     2. Temperature or Humidity not valid 0x01
     3. Date or Time not valid 0x02
     4. Longitude or Latitude not valid 0x04
     5. Altitude not valid 0x08
     6. Position not home 0x10

## Protocols:

* 1. HUB to Focuser
     1. Header STX 0x02 unsigned char [0]
     2. Command\_number unsigned char [1]
     3. Focuser\_target unsigned int [2 – 3]
     4. Focuser direction unsigned int [4 – 5], 0 = outwards
     5. Footer ETX 0x03 unsigned char [6]
  2. Focuser to HUB
     1. Header STX 0x02 unsigned char [0]
     2. Command number unsigned char [1]
     3. Focuser status unsigned char [2]
     4. Focuser position unsigned int [3 – 4]
     5. Temperature float [5 – 8]
     6. Humidity float [9 – 12]
     7. Year unsigned char [13]
     8. Month unsigned char [14]
     9. Day unsigned char [15]
     10. Hour unsigned char [16]
     11. Minute unsigned char [17]
     12. Second unsigned char [18]
     13. Latitude float [19 – 22]
     14. Longitude float [23 – 26]
     15. Altitude float [27 – 30]
     16. Footer ETX 0x03 unsigned char [31]

## Hardware Pin Out

* 1. Focuser Arduino Mega
     1. Amis Step Pin output 33
     2. Amis Direction Pin output 31
     3. Amis Chip Select Pin output 29
     4. Amis Clear Pin output 27
     5. Amis Error Pin input 25
     6. Amis POR Pin output 23
     7. Amis SLA Pin input A0
     8. DHT22 Pin input 44
     9. Home Sensor Pin input 42
     10. HUB LED Pin output 48
     11. GPS LED Pin output 49
     12. Running LED Pin output 46
     13. HUB TX Pin output 19
     14. HUB RX Pin input 18
     15. GPS TX Pin output 15
     16. GPS RX Pin input 14
     17. Display DIN output 11
     18. Display Chip Select Pin output 10
     19. Display Clock Pin output 12