

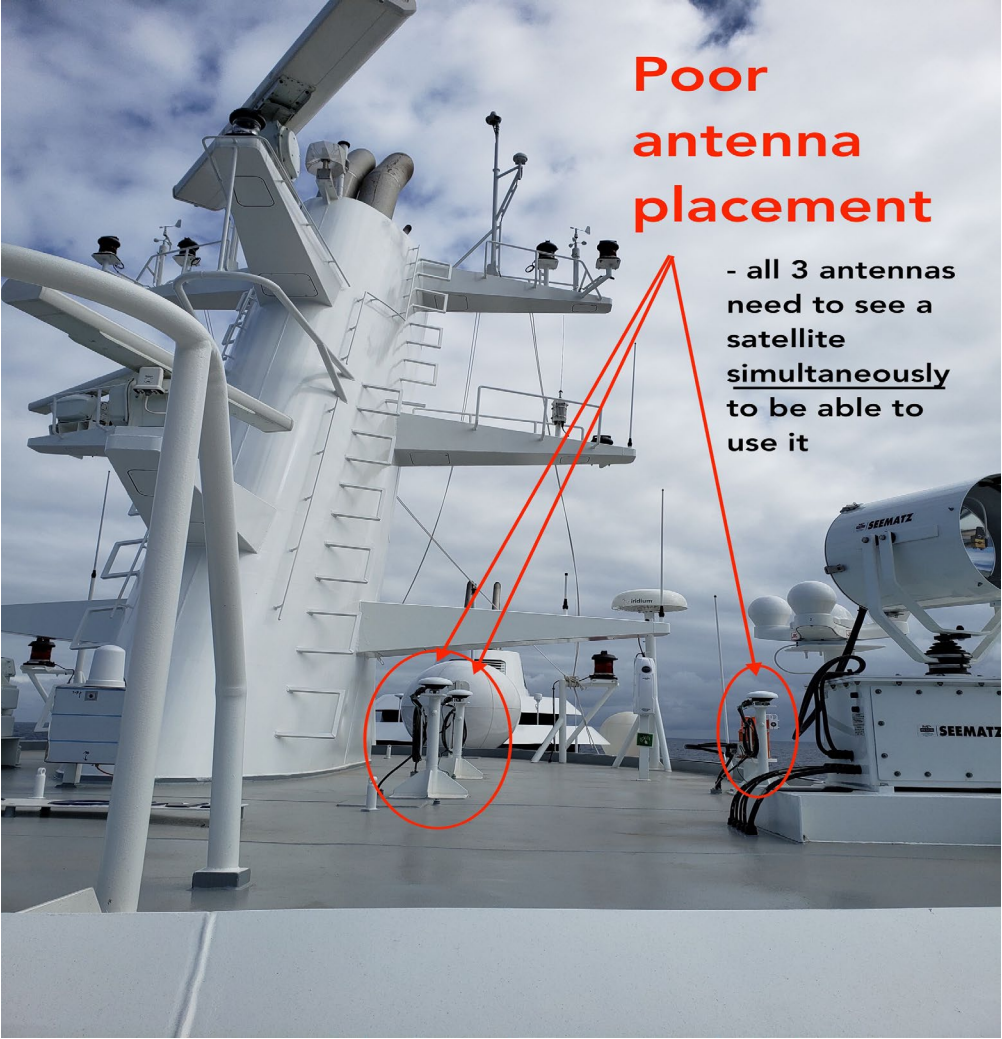
ABX-Two Installation & Configuration



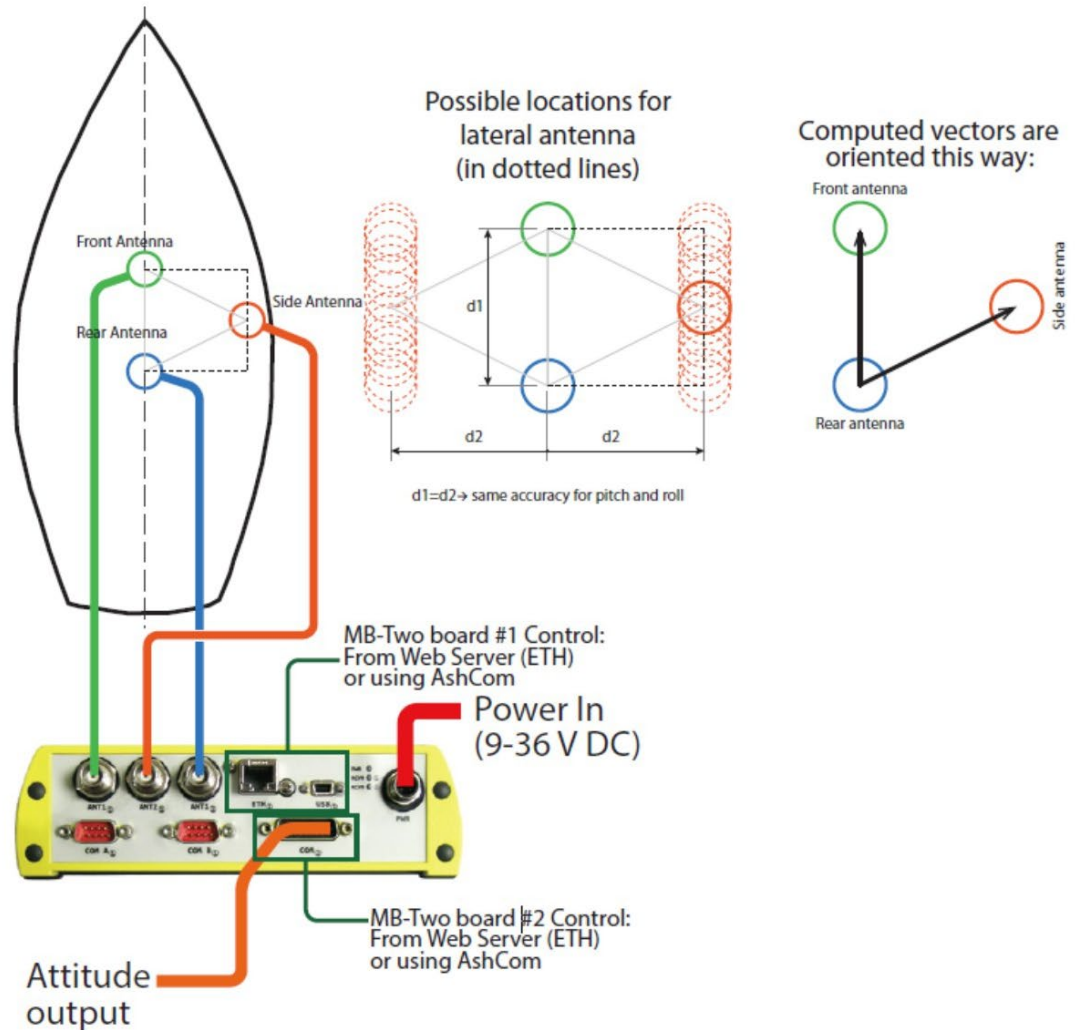
Overview

- ❖ Antenna Placement
- ❖ Internal components & Ports
- ❖ Obtaining IP / Static IP
- ❖ Configuring Board #1 – Duo Antenna Mode
- ❖ Configuring Board #2 – Sol Antenna Mode

Antenna Placement

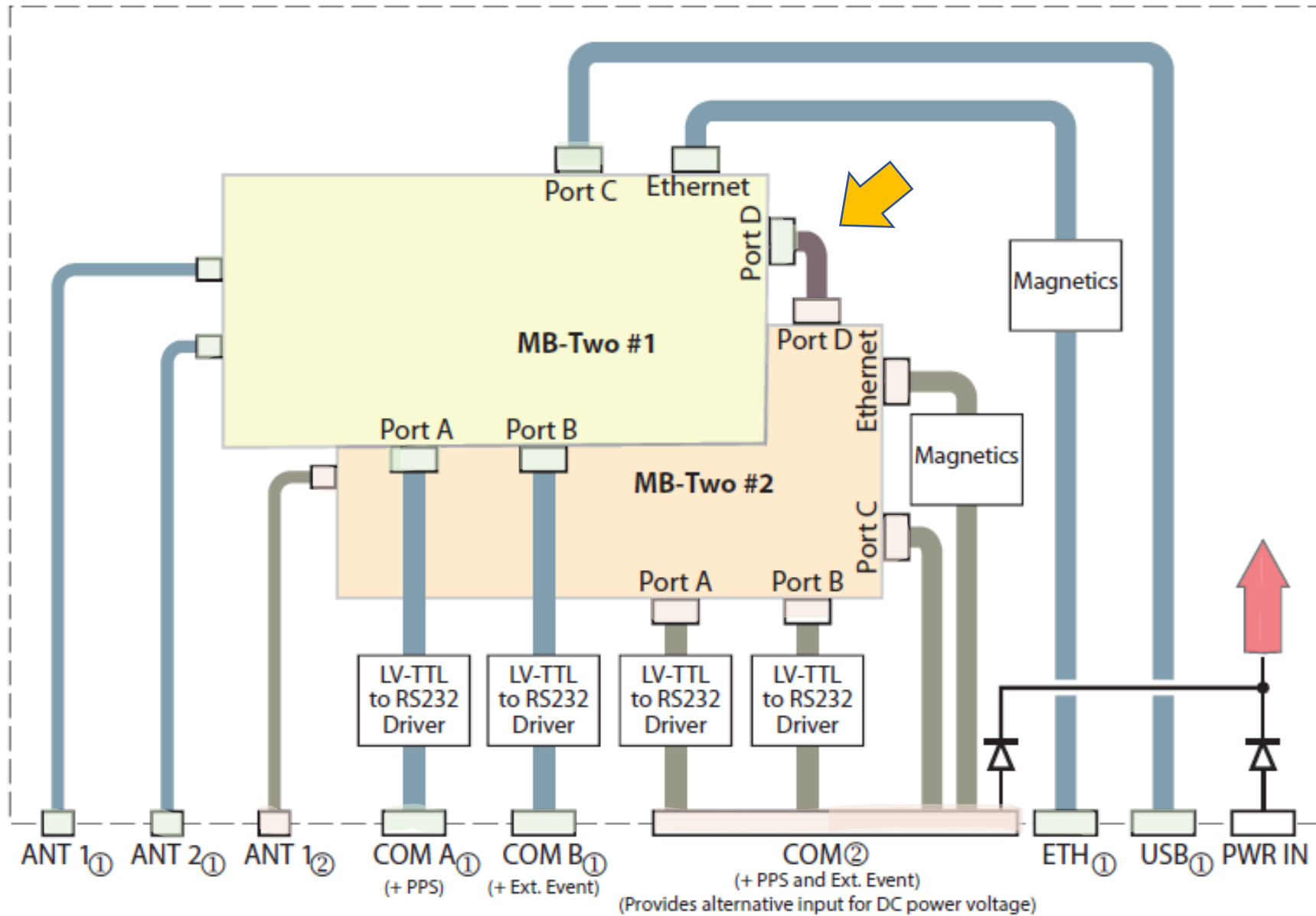


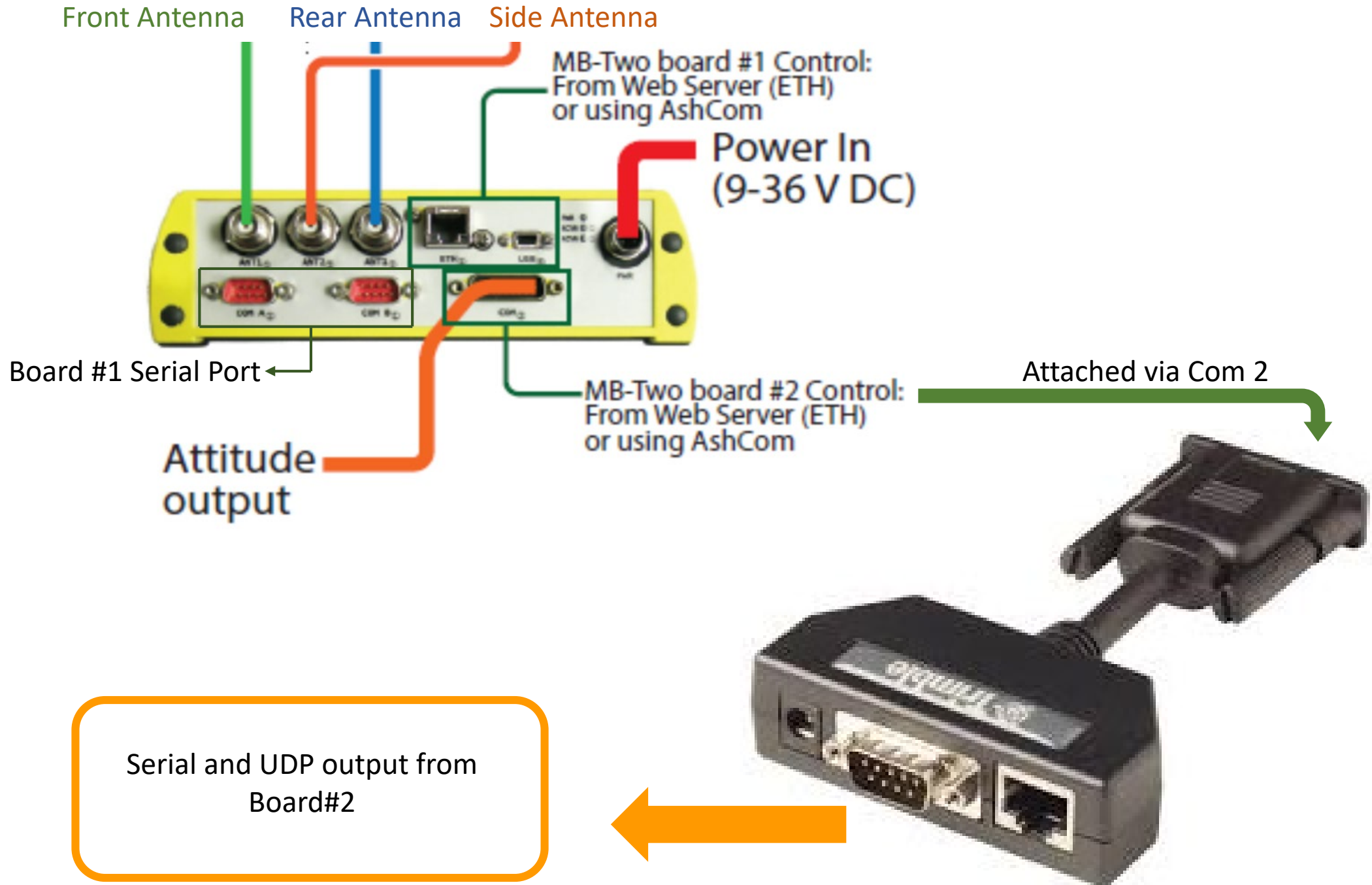
Antenna Placement

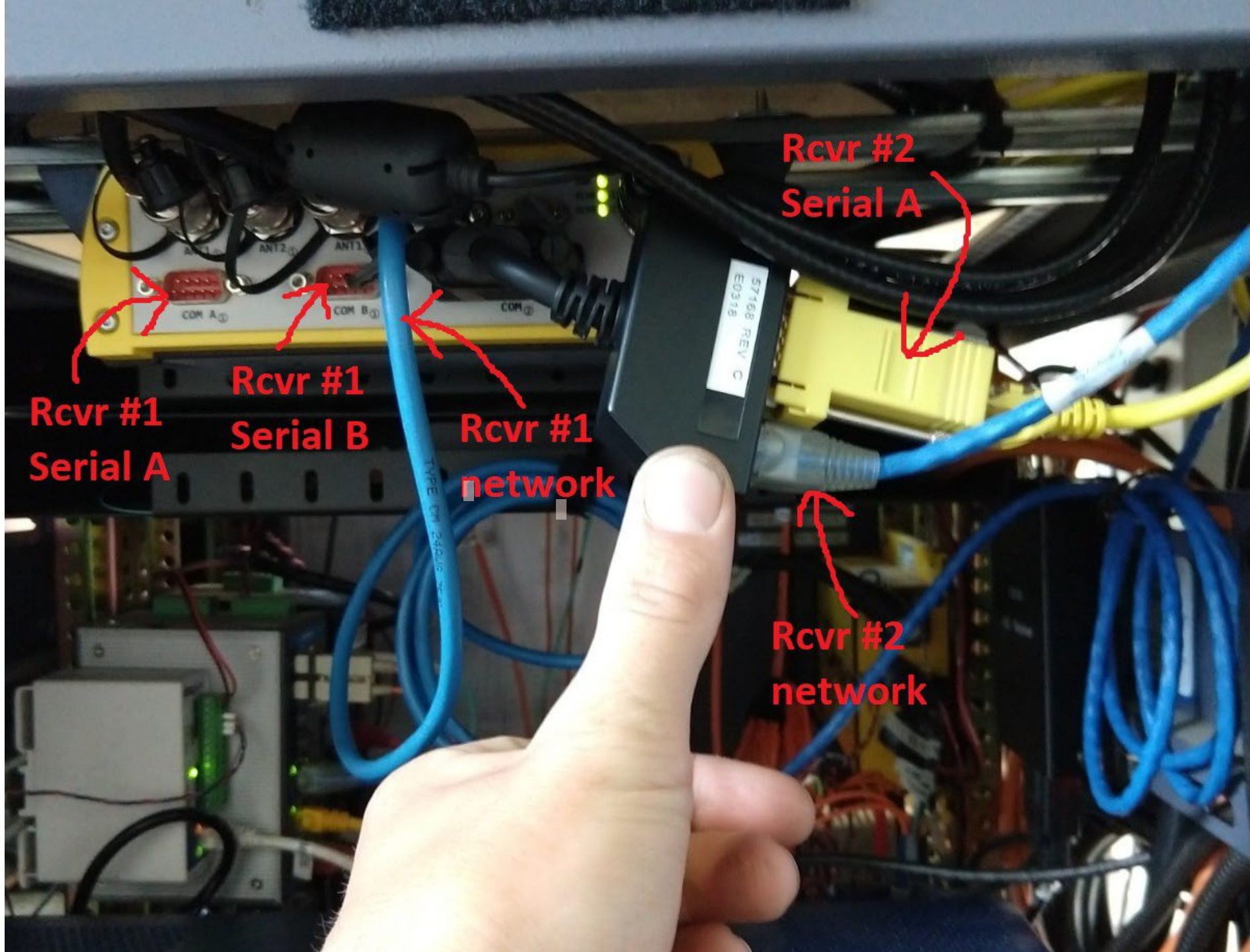


- Antenna should be placed on the centerline of the ship if possible
- Front and rear antenna should remain in line with each-other; this removes the need to calculate a Heading Offset
- Base length between the antennas can be between 30cm and >20m
- Best practice is to mount all 3 antennas on the same horizontal plane, this removes the need for an elevation offset.

Internal Diagram







Rcvr #1
Serial A

Rcvr #1
Serial B

Rcvr #1
network

Rcvr #2
Serial A

Rcvr #2
network

By default both Boards are in DHCP mode

(1) connect a serial cable to COM-A, board 1 (p.72)

determine the IP address of board 1 (“\$PASHQ,ETH”)

(2) plug in network cable to ethernet port, board 1

user a browser to go to the IP; follow the steps for “board 1”

Configure

Board #1

(3) connect a serial cable to COM-A, board 2 (on the adapter cable)

determine the IP address of board 2 (“\$PASHQ,ETH”)

(2) plug in network cable to ethernet port, board 2 (on the adapter cable)

user a browser to go to the IP; follow the steps for “board 2”

Configure

Board #2

Using Static IP address (DHCP mode off)

- Connect to each board through its associated serial port
 - Default baud rate 115200Bd

\$PASHS,ETH,PAR,DHP,0,ADD,<IP Address>,MSK,<Subnetwork Mask>,GTW,<Gateway IP Address>,DN1,<DNS 1 IP Address>,DN2,<DNS 2 IP Adress>

- Response line if command is successful:

\$PASHR,ACK*3D

- Check IP Address by running command

\$PASHQ,ETH

Configuration of Board #1 in Duo Mode (two antennas)

The screenshot shows the Trimble web interface for configuring a board in Duo Mode. The interface is divided into several sections:

- Multi-Sensor Mode:** Set to "Two Antennas (L1/L2 + L1/L2)".
- Reference Position:** Set to "Antenna Reference Point (ARP)".
- Primary Antenna:**
 - Manufacturer: Trimble
 - Antenna Name: GA830
 - RINEX Name: TRM44830.00
 - Method: Bottom of antenna mount
 - Height: 0.000 m
- Secondary Antenna:**
 - Manufacturer: Trimble
 - Antenna Name: GA830
 - RINEX Name: TRM44830.00
 - Method: Bottom of antenna mount
 - Height: 0.000 m
- Virtual Antenna:**
 - Antenna Name: OFF

At the bottom, there are two buttons: "Configure" (highlighted with a green box) and "Cancel".

- Two antennas will be used by board one and they should be set for L1/L2 + L1/L2 as you want both to receive the dual frequencies. The internal MB-two boards do NOT contain the firmware for L-Band and therefore should not be used.
- Use the Antenna Reference point unless mounting the antennas at any angle
- Setting the proper antenna type improves the GNSS receiver, since the L1/L2 phase offsets are known and can be accounted for.
- Height should be set to zero as this references the “above ground” measurement

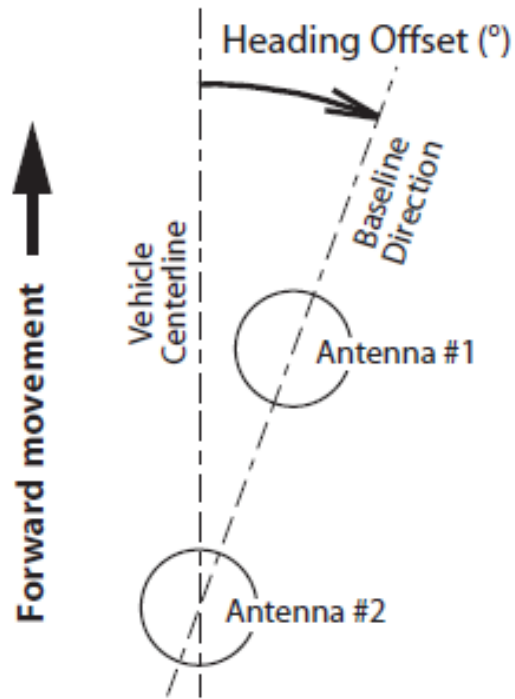
Board #1 Attitude / Heading OFF

The screenshot shows a configuration window titled "Attitude/Heading Setup". At the top, there are tabs for "Position", "I/Os", "Radio", "Network", "Satellites", "Memory", and "Configuration". The "Attitude/Heading Setup" dropdown menu is open. The "Mode" is set to "OFF", with a blue arrow pointing to it. Below this, the "Vector Description" field is empty. The "Length Type" is set to "Changing (Flex)". The "Settings" section contains four input fields: "Azimuth Offset" (0.00), "Elevation Offset" (0.00), "Max. Baseline Elevation" (15), and "Baseline Tolerance" (0.010 m). At the bottom, there are "Configure" and "Cancel" buttons.

Attitude Mode has to be turned off as the Attitude will be computed and delivered from Board#2

- If the Forward and Rear antenna are unable to be installed in line with each-other, Heading will need to be computed on Board#1 to input offsets.

Board #1 Attitude / Heading



Best Practice to install the Forward #1 and Rear #2 antenna in line with each other and ideally parallel to the centerline of the ship.

However if this is not possible a Heading (azimuth) offset must be measured

Trimble Home Receiver Support

Position I/Os Radio Network Satellites Memo

Attitude/Heading Setup

Mode Heading

Input Internal

Vector Description

Length Type Fixed

Auto Calibration

Vector Length 1.596 m

Settings

Azimuth Offset -90.00 °

Elevation Offset 0.00 °

Max. Baseline Elevation 15 °

Baseline Tolerance 0.010 m

Configure Cancel

Board #1 Rover Configuration

The screenshot shows the Trimble web interface for configuring a rover. The top navigation bar includes the Trimble logo and buttons for Home, Receiver, and Support. Below this is a secondary navigation bar with buttons for Position, I/Os, Radio, Network, Satellites, and Me. The main content area is titled "Rover Setup" and is divided into two sections: "Rover Settings" and "Other Settings".

Rover Settings

- Warning! Attitude Computation is ON.
- Processing Mode: RTK (marked with a red X)
- Input Mode: Automatic (selected), Manual (unselected)

Other Settings

- Primary GNSS system: GPS
- Output Position Type: RTK Position (marked with a red X)
- Rover Dynamics: Adaptive

At the bottom of the form are two buttons: "Configure" and "Cancel".

- Remember - “Attitude Computation ON” should not be displayed as this is it will be computed by Board#2
- **Do NOT** set Rover to RTK as no DGPS corrections are received.
 - RTK requires an additional receiver to intake corrections from land base stations.
 - Land base stations have a range of 10-30km displaying their inadequacies in supplying correction to the ABX-2

Board #1 Rover Configuration

Trimble Home Receiver Support

Position I/Os Radio Network Satellites Men

Rover Setup

Rover Settings

Processing Mode Autonomous

Other Settings

Primary GNSS system GPS

Output Position Type SBAS Differential Position

Rover Dynamics Ship

Configure Cancel

- Rover should be set up using SBAS (Satellite-based augmentation systems)
- DGPS corrections are received by the installed antenna, removing the need for an additional receiver.

Board #1 Base Configuration – Moving Base

Trimble Home Receiver Support

Position I/Os Radio Network Satellites Men

Base Setup

Virtual Antenna

Antenna Name OFF

Primary Sensor Settings

Station ID 31

Base Mode: Static Moving

Secondary Sensor Settings

Station ID 32

Base Mode: Static Moving

Other Settings

Primary GNSS system GPS

Configure Cancel

Board #1 Output Messages

RNX&ATR corrections stream (ATOM format necessarily) have to be generated on port D and related to the rear antenna

Ask for 10Hz Corrections stream

Type	Port	Name	Input	Output Primary Antenna	Output Secondary Antenna
Serial	A (9600bds)	A	-	NMEA-GGA(1 Hz) NMEA-RMC(1 Hz) NMEA-VTG(1 Hz) NMEA-ZDA(1 Hz)	-
Serial	B (115200bds)	B	-	-	-
Serial	D (115200bds)	D	-	ATOM-ATR ATOM-RNX-204(10 Hz)	ATOM-ATR ATOM-RNX-204(10 Hz)

Position I/Os Radio Network Satellites Men

Input Setup and Output Messages

Serial / D ATOM Suspend

Serial Port

Baud Rate 115200

Mode RS232

Output: ATOM

ATOM

Type ATR

Rate ON

Antenna Both

Add/Modify Delete Delete All

Message	Rate	Antenna
ATR	ON	1 and 2
RNX-204	10 Hz	1 and 2

Configure Cancel

Configuration of Board #2 in Sol Mode (1 antenna)

The screenshot shows the Trimble web interface for configuring a receiver. The top navigation bar includes the Trimble logo, 'Home', 'Receiver', and 'Support' buttons. On the right, there are links for 'Rover Mo', 'Position', and 'Base Stat'. Below the navigation bar, there are tabs for 'Position', 'I/Os', 'Radio', 'Network', 'Satellites', and 'Memory'. The 'Sensors/Antennas Setup' section is expanded, showing a dropdown menu for 'Multi-Sensor Mode' set to 'Single Antenna (automatic)', with a blue arrow pointing to it. Below this is a 'Reference Position' dropdown set to 'Antenna Reference Point (ARP)'. The 'Primary Antenna' section contains fields for 'Manufacturer' (Trimble), 'Antenna Name' (GA830), 'RINEX Name' (TRM44830.00), 'Method' (Bottom of antenna mount), and 'Height' (0.000 m). The 'Secondary Antenna' section contains fields for 'Manufacturer' (UNKNOWN), 'RINEX Name' (empty), 'Method' (Bottom of antenna mount), and 'Height' (0.000 m). The 'Virtual Antenna' section contains an 'Antenna Name' dropdown set to 'OFF'. At the bottom, there are 'Configure' and 'Cancel' buttons, with the 'Configure' button highlighted by a green box.

- Web server access to Board#2 gained by ethernet port of Com2 dongle. Navigate to web Server by IP specific to Board#2
- Set Board#2 as a single antenna using the same reference point as Board #1 antennas

Board #2 Rover and Base Configuration

Mirror Settings from Board #1

The screenshot shows the Trimble web interface for configuring a rover. The top navigation bar includes the Trimble logo and buttons for Home, Receiver, and Support. Below this is a secondary navigation bar with tabs for Position, I/Os, Radio, Network, Satellites, and Men. The main content area is titled "Rover Setup" and contains two sections: "Rover Settings" and "Other Settings". In the "Rover Settings" section, there is a warning message "Warning! Attitude Computation is ON." with a yellow arrow pointing to it. Below the warning is a "Processing Mode" dropdown menu set to "Autonomous". The "Other Settings" section includes "Primary GNSS system" set to "GPS", "Output Position Type" set to "SBAS Differential Position", and "Rover Dynamics" set to "Ship". At the bottom of the form are "Configure" and "Cancel" buttons, with "Configure" highlighted by a green box.

The screenshot shows the Trimble web interface for configuring a base station. The top navigation bar includes the Trimble logo and buttons for Home, Receiver, and Support. Below this is a secondary navigation bar with tabs for Position, I/Os, Radio, Network, Satellites, and Men. The main content area is titled "Base Setup" and contains three sections: "Virtual Antenna", "Sensor Settings", and "Other Settings". In the "Virtual Antenna" section, there is an "Antenna Name" dropdown menu set to "OFF". The "Sensor Settings" section includes a "Station ID" input field with the value "31" and "Base Mode" radio buttons for "Static" and "Moving", with "Moving" selected. The "Other Settings" section includes "Primary GNSS system" set to "GPS". At the bottom of the form are "Configure" and "Cancel" buttons, with "Configure" highlighted by a green box.

Rover setup should say "Warning! Attitude Computation is ON" as this is Board#2

Board #2 Attitude / Heading

Trimble Home Receiver Support

Rover Mode → Autonomous + Attitude Satellites Tracked → 36 Ethernet → On Recording → Off
Position Type → S-DGPS Satellites Used → 31 Site name → 0065
Base Station ID → 138 PDOP → 1.0 Memory → Internal 224.6 MB

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Position I/Os Radio Network Satellites Memory Configuration Security

Attitude/Heading Setup

Mode: Attitude

Inputs: External Serial / D Primary Antenna
External Serial / D Secondary Antenna

Vector Description

Auto Calibration ←

Settings

Heading Offset: 0.00 °
Pitch Offset: 0.00 °
Roll Offset: 0.00 °
Max. Baseline Elevation: 15 °
Baseline Tolerance: 0.010 m

Configure Cancel

Activity

Satellites

Satellites Tracked: 36

GPS (13): 2, 3, 6, 12, 14, 17, 19, 22, 23, 25, 29, 31, 32
GLONASS (7): 1, 2, 8, 9, 16, 17, 18
BeiDou (12): 6, 9, 12, 16, 19, 20, 23, 24, 25, 32, 34, 35
QZSS (1): 194
SBAS (3): 131, 133, 138

Antenna Status: Connected (Primary Antenna)

Input/Output

Input: Serial (D) - ATOM ←
Output: Serial (A): NMEA-ATT(1 Hz)-GGA(1 Hz)-RMC(1 Hz)-VTG(1 Hz)-ZDA(1 Hz)
Output: TCP/IP (8212): NMEA-ATT(2 Hz)-GGA(2 Hz)-HDT(2 Hz)-RMC(2 Hz)-VTG(2 Hz)-ZDA(1 Hz)
Output: TCP/IP (8889): NMEA-GGA(5 Hz)-HDT(5 Hz)-ZDA(1 Hz)

Memory

Internal Memory: 0% (3 Files) 224.7 MB

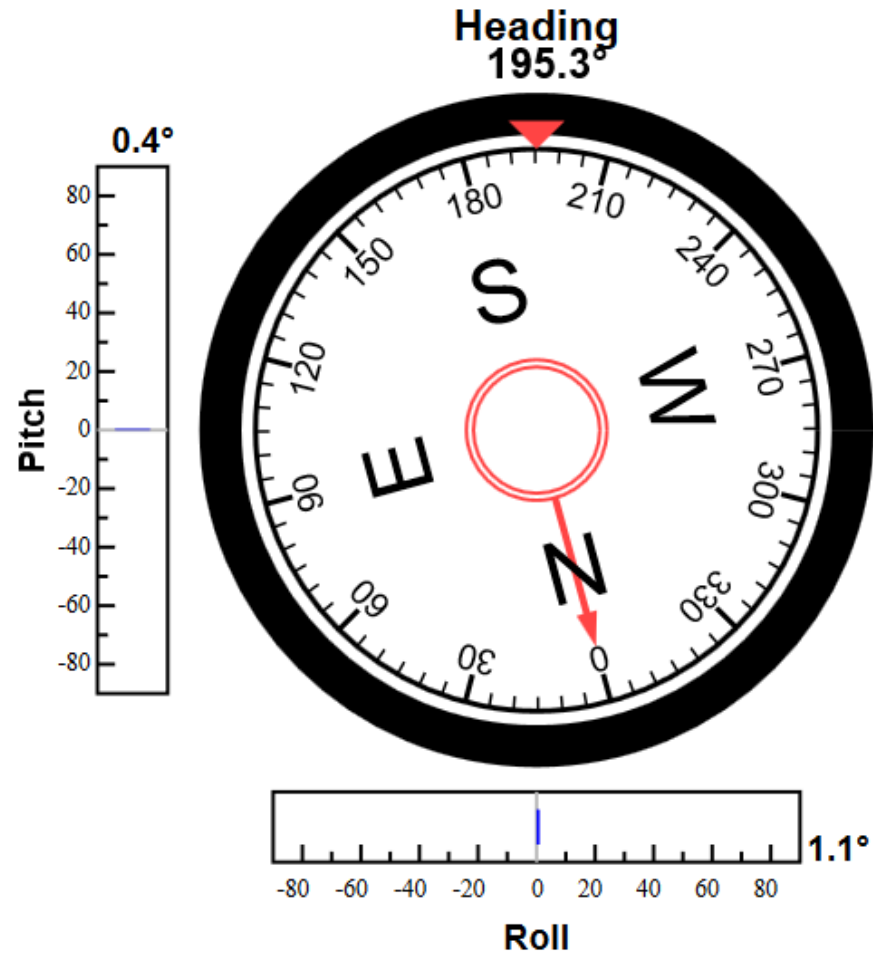
Recording

No data recording in progress

- Board#2 will compute Attitude with corrections via Serial Port D (internal) from the Primary (forward) and Secondary (rear) antenna
- Auto Calibration should be selected in this application

Board #2 Attitude / Heading

Attitude Display



Attitude Display shows all information relative to the attitude mode (Heading, Pitch, & Roll)

Status: Solution Available (Fixed Solution)

Heading: 195.300°

Pitch: 0.370°


Roll: 1.050°

Vector Length: 4.102 m / 4.395 m





MRMS: 0.007 m

BRMS: 0.008 m

Board #2 Output Messages


[Home](#)
[Receiver](#)
[Support](#)

Rover Mode → Autonomous + Attitude Satellites Tracked → 37 Ethernet → On Recording → Off
 Position Type → S-DGPS Satellites Used → 32 Site name → 0065
 Base Station ID → 133 PDOP → 1.0 Memory → Internal 224.6 MB

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[Position](#)
[I/Os](#)
[Radio](#)
[Network](#)
[Satellites](#)
[Memory](#)
[Configuration](#)
[Security](#)

Input Setup and Output Messages

Serial / A NMEA

Serial Port

Baud Rate 9600

Output: NMEA

NMEA

Type Rate

Message	Rate
ATT	1 Hz
GGA	1 Hz
RMC	1 Hz
VTG	1 Hz
ZDA	1 Hz

Type	Port	Name	Input	Output
Serial	A (9600bds)	A	-	NMEA-ATT(1 Hz) NMEA-GGA(1 Hz) NMEA-RMC(1 Hz) NMEA-VTG(1 Hz) NMEA-ZDA(1 Hz)
Serial	B (115200bds)	B	-	-
Serial	D (115200bds)	D	ATOM	-
USB serial	-	C	-	-
UDP	255.255.255.255:8212	I	-	NMEA-ATT(2 Hz) NMEA-GGA(2 Hz) NMEA-HDT(2 Hz) NMEA-RMC(2 Hz) NMEA-VTG(2 Hz) NMEA-ZDA(1 Hz)
TCP	8889	F	-	NMEA-GGA(5 Hz) NMEA-HDT(5 Hz) NMEA-ZDA(1 Hz)
NTRIP/DirectIP	-	P	-	-
NTRIP/DirectIP	-	Q	-	-
CAN Bus	V (250 kbits/second)	V	-	-

- Board #2 will output user defined NMEA strings via “Serial A” or over UDP
- Note: both of these ports are located on the dongle connected to Com2.

SUCCESS!

