POS MV Installation Check List

The following notes are to be used in conjunction with the POS MV Installation and Operation Guide. Please read the guide thoroughly before attempting to install POS MV. Use these notes as a prompt during installation.

1. Unpack the system and check against packing list enclosed within the transit case.

2. Install GPS antennas

   - Connect GPS antenna cables to antennas
   - Seal GPS cable connectors with self-amalgamating tape.
   - Secure GPS antennas on highest possible surface (clear 360° view of sky)
   - The antennas should be rigid with respect to each other and the IMU.
   - Antennas should be separated by at least 1 metre and less than 5 metres.
   - Both antennas should face in the same direction.
   - Clearly mark the Primary antenna cable at both ends.
   - Run antenna cables to the PCS location.

3. Install IMU (Inertial Measurement Unit)

   - Mount the IMU at the heave sweet spot and close to the multibeam transducer.
   - Check orientation of the IMU (Markings on top of IMU). Normally X should point to the bow and Y to starboard.
   - Ensure base is horizontal (i.e. aligned with vessel frame in roll and pitch). Alternatively the IMU with respect to vessel frame misalignment angles must be measured and entered into the POS MV.
   - Ensure IMU location is not subject to excessive vibration.
   - Tighten IMU to base plate without over torqueing.
   - Run IMU cable to the PCS location.
   - Connect IMU cable to IMU

4. Install PCS (POS Computer System)

   - Mount PCS in 19” rack using appropriate hardware. Do not hang the PCS off the 19” panel mounts! Support the PCS weight from underneath before tightening 19” panel mounts.
   - Connect the Primary antenna cable to the ANT 1 connector on the PCS.
   - Connect the Secondary antenna cable to ANT 2 connector on the PCS.

- Provide suitable strain relief for antenna cables as necessary.
- Connect the IMU cable to the IMU connector on the PCS.
- Power input required is 120V or 240Vac.
- Ensure power lead supplies a good earth/ground.

5. Measure Offsets

- Reference to IMU lever arm.
- Reference to Primary GPS lever arm (***this lever arm is mandatory***).
- Reference to Vessel lever arm.
- Reference to Sensor 1 and Sensor 2 lever arms. (This value is usually input to the echosounder acquisition system. ***Do not input to both systems!***)
- Reference to Auxiliary GPS.
- Reference to Centre of Rotation.

NB **POS MV uses a right-hand Cartesian co-ordinate system. Hence the lever arm offsets should be entered using the following rules:**
+X=to Bow, +Y=to Starboard, +Z=Down

NB **When using DGPS, lever arms should be measured to ±0.05m. When using RTK, lever arms should be measured to ±0.005m.**

6. Network Controller PC

- Windows XP/7 can be used with the POS MV POSView software program.
- Connect 10/100BaseT LAN cable to LAN connector on PCS.
- Connect LAN cable to PC Ethernet port or Hub (crossover cable required for direct connection, orange cable in transit case, straight through cable required for LAN connection via hub).
- Install POS MV POSView software.

7. Power Up System

- Ensure GPS antennas, LAN, and IMU cables are connected.
- Power on by using the power switch on the rear of the unit, then pressing and holding the power button on the front panel. (To power off, press and hold the power button until the LED begins to flash).

NB **Do not connect or disconnect cables from POS MV system when the system is powered up, as it could cause the system to fail.**

8. Installation Data Input

- Select Tools menu. Select Connect.
- Select Settings|Installation|Lever Arms & Mounting...

- Input measured lever arms. Care should be taken to ensure correct conventions are used to input this data. Select OK.
- Select Settings|Save Settings.

NB The POS MV POSView software always boots up in Monitor mode. No settings can be changed unless in Connected mode. No settings are written to Non Volatile Memory without using the command Save Settings.

9. Output Configuration

- Use Settings|Input/Output Ports to configure as required
- Select Settings|Save Settings

10. DGPS or RTK Corrections

- Select Settings|Input/Output Ports…
- Configure Base 1 GPS Input to communicate with the source of RTCM or CMR corrections as required
- Configure Base 2 GPS Input if appropriate
- Select Settings|Save Settings

11. Installation Calibration Procedure

- Select View menu. Select GAMS Solution.
- Select Settings|Installation|GAMS Installation.
- Ensure that the X, Y and Z components of the Baseline Vector are all zero.
- Enter a heading threshold value in excess of zero and less than 1.000° dependant upon dynamic motion available to vessel. The more dynamic the vessel, the lower this value.
- Select Settings|Save Settings

12. Calculate GAMS Solution

- Turn the POS MV Status to Standby and then to Navigate to reset the system.
- Wait for GAMS Status to change from Not Ready to Ready Offline. Progress can be monitored under View| GAMS Solution. This should take approximately 5 to 15 minutes, dependent on the GPS environment. The calibration can only be performed when the number of satellites in view exceeds 5 and PDOP is much less than 3.0. If GPS environment is acceptable, but ambiguities are not fixed within 45 minutes, then check the antenna mountings for rigidity.
- Manoeuvre the vessel through moderately aggressive turns (figure 8s and s-turns) incorporating changes of speed and direction.
- Wait for the Heading Accuracy on the main screen to show accuracy below the threshold value entered (try to obtain lowest value possible) at the same time as the GAMS Status shows Ready Offline.

- All stop the vessel and hold a constant heading. From the Settings Menu select GAMS Calibration Control| Start.
- The GAMS Status should cycle through the following messages; CAL Requested, CAL In Progress, CAL Complete, thereafter Online. This cycle should last approximately 1 minute.
- Monitor GAMS status for 10 minutes. GAMS Status should normally read Online. The occasional Ready Online message can be ignored.
- If the calibration parameters are not valid, then the status screen will show repeatedly Ready Online or Not Ready. This will also be reported in the message log as GAMS solution NOT In Use or GAMS Ambiguity Resolution Failure. If this occurs, check the rigidity of the antenna mounts and then repeat the calibration procedure beginning at step 11.
- Otherwise, select Settings|Save Settings to save the configuration to the PCS.

13. Check Start-up

- With the Standby and Navigate shortcut buttons on the tool bar, switch POS from Navigate to Standby, wait five seconds, and then switch back to Navigate.
- Wait for POS to initialise and check that GAMS is Online within about 5 minutes.

14. Installation Calibration Control

- If required, select Settings|Installation|Installation Calibration control to refine the Reference to Primary GPS lever arm. Note that the system should be in Fixed RTK mode before commencing this routine.
- Ensure the Reference to Primary GPS lever arm is selected (check box)
- Click “Auto Calibration”
- Manoeuvre the vessel through moderately aggressive turns (figure 8s and s-turns) incorporating changes of speed and direction.
- The Installation Calibration Control routine is completed once the “Figure of Merit” reaches 100. Under “Auto Calibration”, the refined estimates for the Reference to Primary GPS lever arm are automatically transferred to the appropriate location in the POS MV configuration
- Select Settings|Save Settings to save the configuration to the PCS.

15. Patch Test

- In accordance with multibeam manufacturer recommended procedures.

16. Installation Parameter Backup

- Save a copy of the POS MV settings to disk using File|Save POS Config.