

Innomar SBP Quick Start Guide

Transducer Handling & Installation

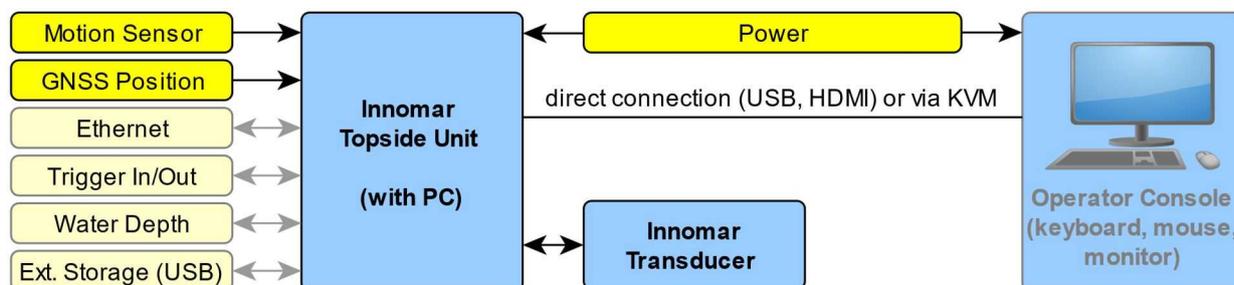
See section 3.2 on page 26 for details on transducer handling and installation.

- ! **Make sure the transducer fits to the topside model** used (letter in s/n, see page 26).
- Check transducer visually (face, cable, connector) → do not use damaged equipment, there are high voltages used inside, which may be lethal!
- The transducer must not be operated in air.**

Guidelines:

- Protect the transducer face (mechanical impact, chemicals, direct sunlight).
- Protect the cable (mechanical impact), avoid vibrations and strong bending → preferably route within pole.
- Protect the connector, it is NOT water-proof.
- For long-term deployments use zinc anodes and anti-fouling.
- The transducer face has to be horizontal, the arrow pointing forward (to bow).** (there are no arrows on the “smart” and “quattro”/“sixpack” transducers)
- Avoid vibrations; use rubber washers as provided and support the mounting pole.
- Place transducer as far as possible from noise sources → near vessel’s bow.
- Avoid air bubbles washed beneath the transducer.
- Use extra ground wire from transducer to topside unit** to reduce electrical noise.
- During operation the transducer has to be covered by water at all times.**
- Connect / Disconnect to topside unit only if power is switched off.
- After demobbing clean with fresh water and dry before storage.

Topside Handling & Installation

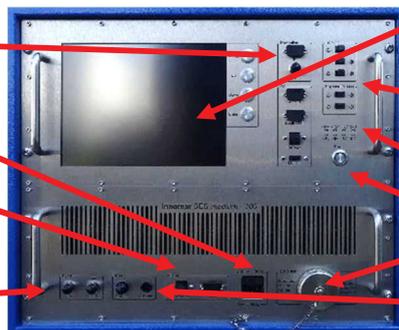


INNOMAR SBP general components (actuals depending on SBP model)

See section 3.3 on page 32 for details on topside unit handling and installation.

- ! Check topside visually (connectors, cables, housing) → do not use damaged equipment, there are high voltages used inside, which may be lethal!
- Handle topside with care, keep clean, dry and secured; protect against water.**
- Ensure proper airflow to avoid hot spots.**
- Secure all components and connections.

- GNSS position input (NAV-IN; Ethernet or serial port; update rate preferably 10Hz)
- Power (for most models mains 100–240 V, 50–60 Hz AC)
- Motion sensor input (Ethernet or serial COM port; update rate preferably 50Hz)
- Trigger / external synchronisation to reduce acoustic interference
- TFT display + controls
- PC interfaces
- Status LEDs
- Power switch
- Transducer
- GND



SESWIN Setup – Start & Interfaces

- Preferably use “seswin24bit.exe” → records 24-bit SES3 files (6)
- Start SESWIN from Windows desktop (1)
- SESWIN start screen opens:
 - optional: select setup / reset to factory defaults (2)
 - select “system control port” (for models with external PC) (3)
 - set interface ports (COM / UDP) (4)
- Click “OK” button → SESWIN app starts (5)



For models with external control PC, use the “Search” button to find the actual IP address of the topside unit.

Please see section 5.2 on page 38 for more details.

Menu Bar →

Info Sidebar →

Status Bar →

Depth Display

Depth Ruler

Zoomed LF SBP echo plot

Signal Window

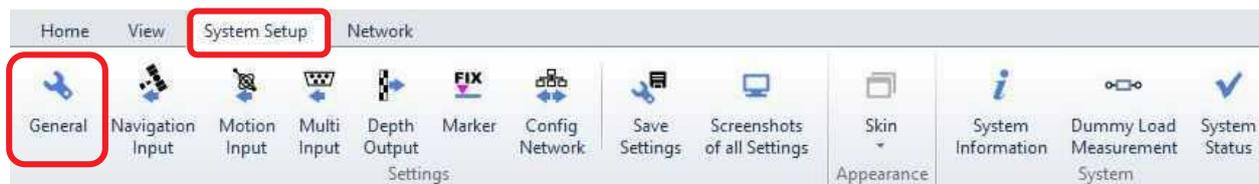
SBP echo plot area

Please see section 5.3 to 5.8 on pages 41 to 45 for more details.

The indicators in the Status Bar give a quick overview on the interface conditions.

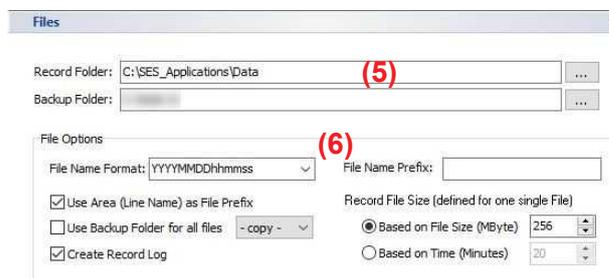
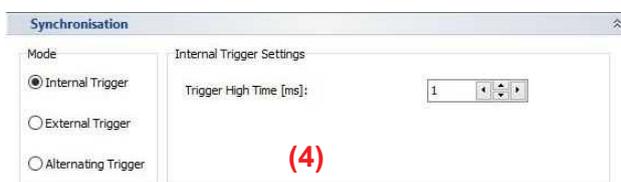
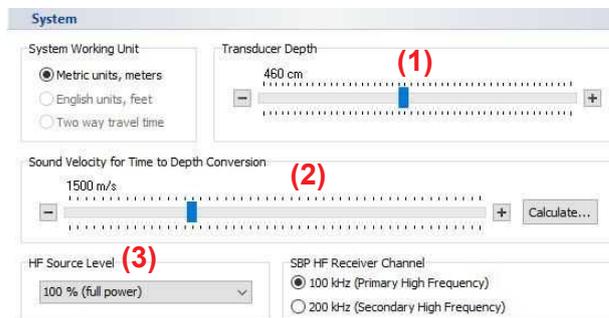
- Data received and interpreted OK
- Data received, but warning
- Traffic seen, but no usable data found
- Port not available or no data / traffic

SESWIN Setup – General Settings



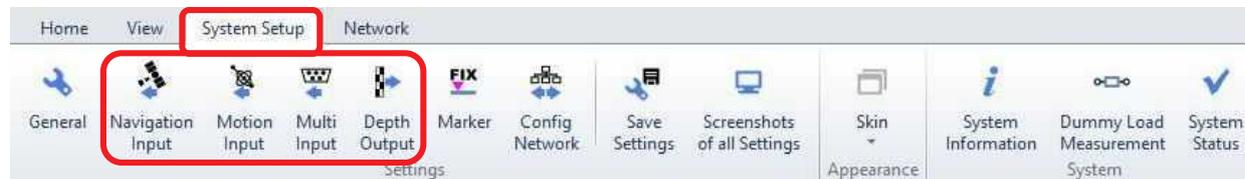
See also section 5.11.1 on page 58.

- Set transducer draught (1)
- Set average sound speed for time-to-depth conversion (2)
- Set HF source level → keep 100% (3)
- Set trigger / synchronisation as required (4)
- Set record file location (5) and naming (6)



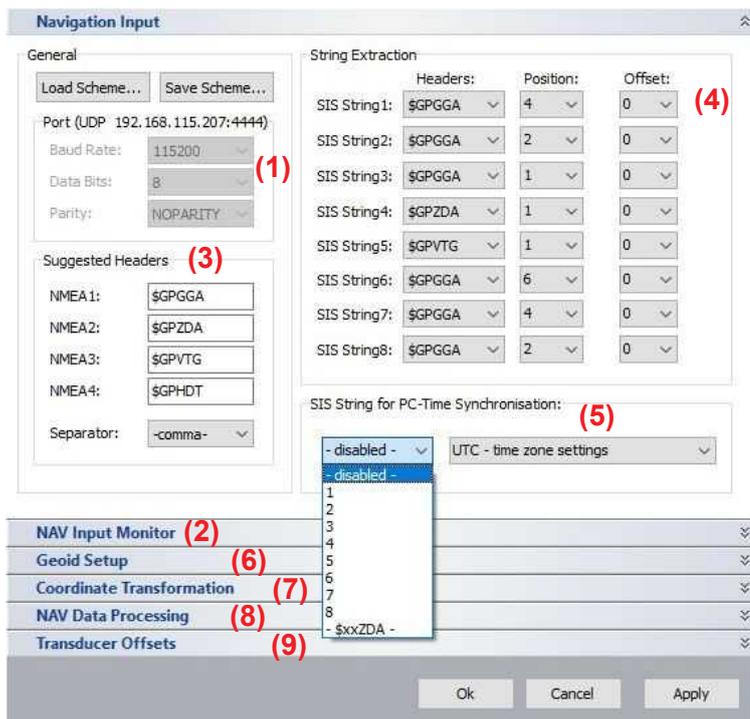
For trigger / synchronisation setting details see chapter 6 on pages 81 ff.

2SESWIN Setup – Interface Configuration



NAV Input (GNSS Position) see section 5.11.8 on page 64

- Check port settings (1) for COM port set baud rate (as high as possible)
- Check incoming data with NAV input monitor (2)
- Set NMEA headers to be used and separator (3)
- Set what parts to be extracted and stored to SIS fields (4)
- Set PC clock synchronisation (preferably to "\$xxZDA") (5)
- Optional: set geoid (6) and projection (7) parameters
- Optional: set processing (8)
- Optional: set offsets (9)



Motion Input

see section 5.11.14 on page 70

- Check port settings (1) for COM port set baud rate (as high as possible)
- Set protocol / format used (2); preferably use a short format like EM3000
- Check incoming data with motion monitor (3) or in main window
- Optional: adapt heave scale factor or invert by "-1" (4)
- Optional: enable lever arm correction (5) and set lever arms (6)
- Optional: if motion data is via UDP Ethernet, the IP address of the microcontroller may need to be changed (7)

Multi Input (Optional)

see section 5.11.15 on page 73

- can be used for simple remote control, heading input or external (MBES) depth input

Depth Output (Optional)

see section 5.11.16 on page 75

- can be used to output online bottom track and other info

Sync (Trigger) IN/OUT & 1-PPS Input

Sync IN (1)

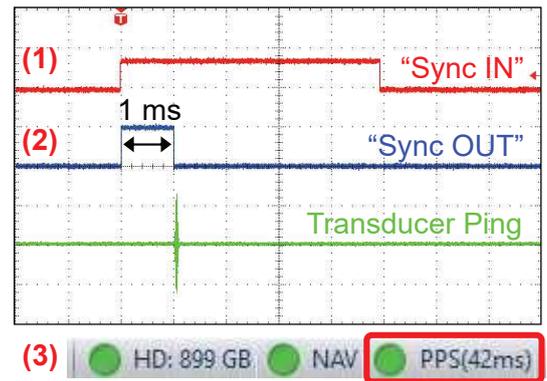
- BNC socket; TTL or RS232 level

Sync OUT (2)

- BNC socket; RS232 level (+/- 10V)

1-PPS Input (3)

- Used to check delay of position data; delay is shown in status, but not used for correction
- TTL, 5V positive, 1ms pulse at pin 1 of the “NAV IN” COM port (or dedicated BNC input)
- Works with serial NAV data only, not with UDP
- ZDA string needs to part of the NAV input and PC time sync must be set to “\$xxZDA”

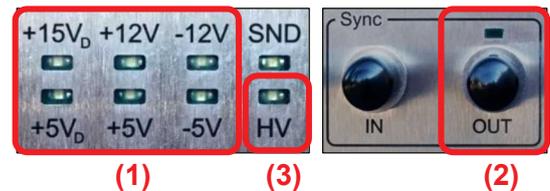


For details see chapter 6 on page 81.

Basic System & SESWIN Setup Check

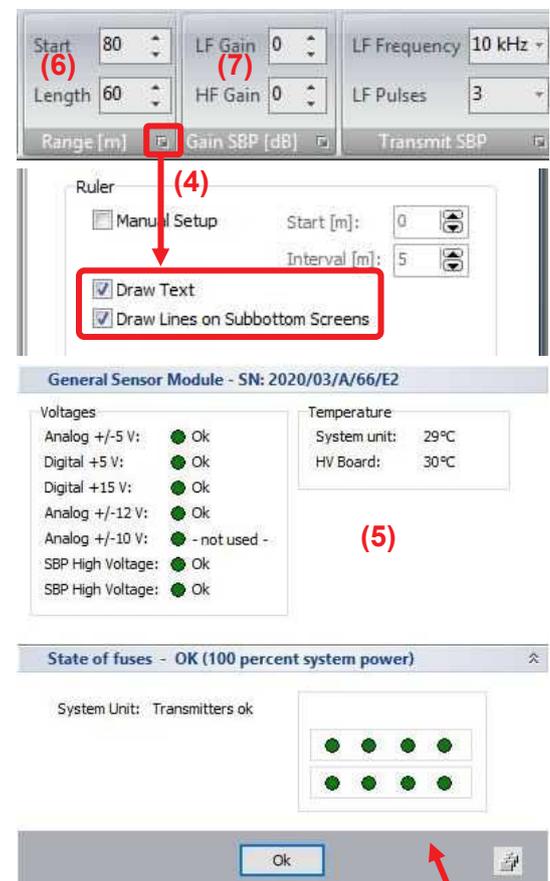
Power ON

- Power switch changes from red to green
- Power LEDs → all turning on (1) (just “HV” & “SND” off)
- Sync OUT LED → starts flashing (2)
- Fans (rear panel) start working
- Windows starts up



Start SESWIN

- “HV” LED → turns on (3)
- Echo plot area → starts scrolling, shows noise (if not, check trigger mode & ruler settings (4))
- Check “system status” → all green, temperature at reasonable value (5)
- Increase range → ping rate decreases (6)
- Increase gain → noise level increases (7)
- Check motion & GNSS interfaces
- Check “transmit” [F4] and data “record” [F5]
- Optional: check external trigger

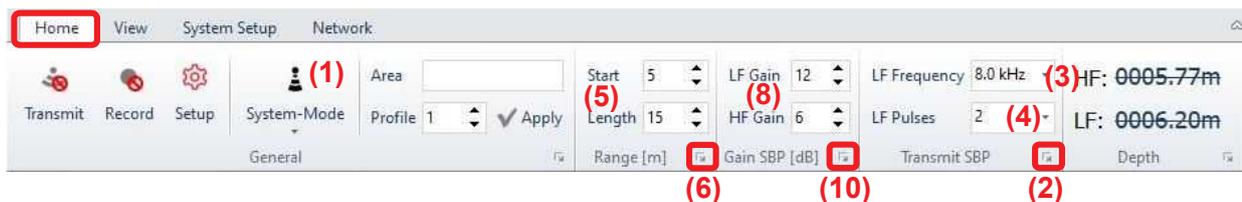


Reporting

- Save screenshots from the settings (8)
- Optional: save settings to new user profile (9)



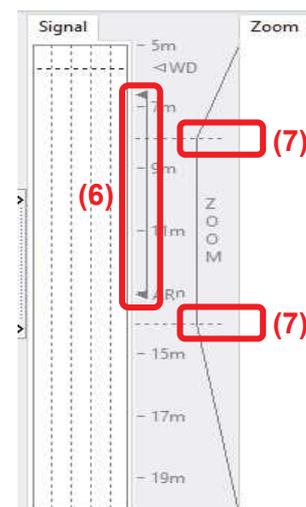
SESWIN Survey Settings



All settings outlined below will affect the data quality and cannot be changed in post-processing. For the “Home” menu please see section 5.9 on pages 46 ff.

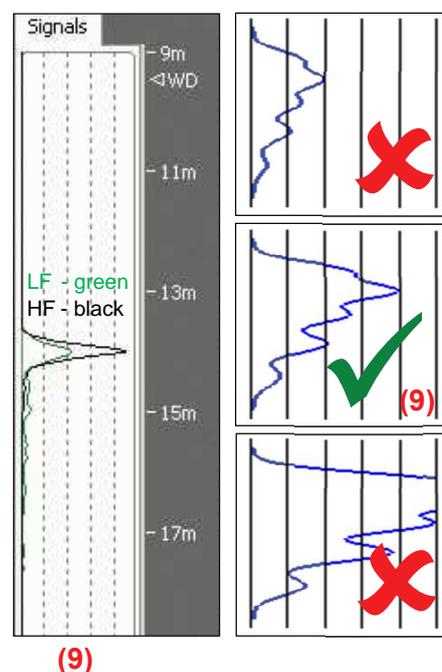
Transmitter Settings

- **System Mode (1)**
 - Usually “sub-bottom single frequency” or “sub-bottom multi ping mode” (in deep waters with internal trigger)
- **Ping Rate (2)**
 - Keep as high as possible (system controlled)
- **LF centre frequency (3)**
 - Start at middle of range and refine; higher frequencies for better resolution; lower frequencies for better penetration (but more noise and less resolution)
- **LF pulse length (4)**
 - Number of cycles of centre frequency, start with “2” and refine; lower values improve resolution, higher values improve signal-to-noise ratio
- **HF power (System Setup > General > System)**
 - Keep at 100% (the HF level directly affects the LF level and thus penetration: HF -3 dB → LF -6 dB)
 - Soft start for marine mammal protection
 - Not to be mixed up with the “HF Gain” setting
- **Trigger / Synchronisation**
 - Internal → highest ping rate
 - External → triggered from MBES to reduce acoustic interference; no multi-ping mode available



Receiver Settings

- **Range Start and Length (5)**
 - Set *range length* to expected / required penetration, keep as short as possible (e.g. 20 m)
 - Adapt *range start* to water depth (also automatic mode possible, thresholds shown in ruler (6))
 - Use handles to adapt zoom (7)
- **HF & LF Gain (8)**
 - Adapt to signal strength → c. 80% full scale (9) (LF: green, HF: black), use almost the full range, but avoid saturation
 - Values will vary with water depth, seabed type and seabed shape (slopes) and need to be adapted
 - Negative gain (attenuation) possible
 - Automatic mode available (10)

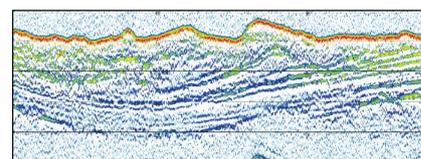


Online Data Visualisation

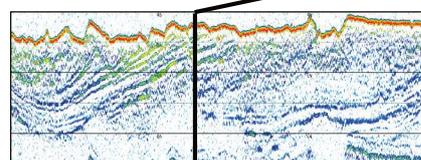


All settings outlined below will NOT affect the data quality and can be changed in post-processing. For the “View” menu please see section 5.10 on pages 55 ff.

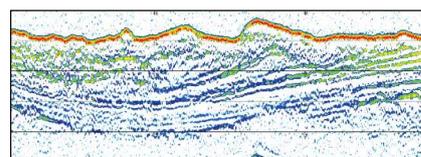
- **Stacking & Smoothing (1)**
 - Used to reduce noise visible on screen
 - Higher values will better suppress noise, but may also remove small features, best keep values to “1” or “2”
- **TVG (time variant gain) (2)**
 - Compensates for propagation loss
 - Higher values may mislead in gain settings, best keep at low value (e.g. zero)
- **Median Filter (3)**
 - Removes spikes (e.g. interference), but may also remove small features; use with care
- **Resolution (4)**
 - “Amplitude” best for noisy data
 - “High Resolution” (default) best for general purpose
 - “Raw Data” best when looking for pipes/cables
- **HF & LF Thresholds (5)**
 - Defines the visible dynamic range
 - “Min Level” sets noise removal level
 - “SRange” sets dynamic range
- **Colours (6)**
 - Set colour mapping used for the echo plot (rainbow colours or shades of grey)
- **Display Style (7)**
 - Defines what echo plot(s) is/are shown (LF+HF / LF only / HF only)



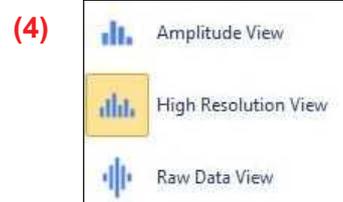
(1) original



(2) stacking



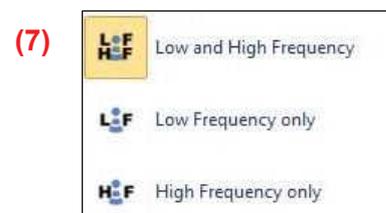
(3) smoothing



(4)



(6)



(7)

Safety Rules

- Do not use damaged equipment, check before operating.
- Do not plug / unplug the transducer if the system is powered.
- Do not operate the system when the transducer is outside water.
- Keep the transducer connector dry.
- Do not open the topside unit.
- Do not operate the system when people are in water near the transducer.

Checklists

Emphasis should be on the hardware installation and on system settings that cannot be altered during post processing: frequency, pulse length (number of pulses), range and gain.

Transducer Installation

- Correct transducer type is used.
- Transducer face, cable and connector checked for damages.
- Transducer is mounted horizontally in stiff frame or supporting structure.
- Transducer is decoupled acoustically from the ship's hull by elastic material (rubber).
- Transducer is located as far away as possible from noise sources.
- Transducer is covered by water at all times, even at rough sea conditions.
- An additional ground wire is going from the transducer's housing to the topside unit.
- The transducer cable is protected and will not vibrate.
- The draught of the transducer is measured and noted.

Topside Unit Installation

- Topside unit is placed in a dry environment.
- Cooling slots (bottom, front and rear panel) are free and there is space for airflow.
- Main power supply is checked. If a generator is used, a ground wire is connected.
- Power cable is plugged in.
- Transducer cable is plugged in.
- Ground wire from the transducer is connected to the topside unit.
- Additional sensors (Motion sensor / GNSS) are connected to the specified ports.
- Check if all connectors are fastened properly and all cables are fixed.

System power-up

- Make sure the transducer is below water level and covered by water all times.
- Switch on main power → the power switch and all power LEDs are lit green, "Sync OUT" starts flashing.
- Start the SESWIN software → "HV" LED turns on, SBP echo plot part of the SESWIN window starts scrolling from right to left. If not, check the synchronisation mode.
- SESWIN "System status" checked → OK.

SESWIN settings

- Set interface (GNSS, motion, ...) ports.
- Set transducer's draught and offsets / lever arms as appropriate.
- Check incoming GNSS (navigation) data (SIS fields populated correctly).
- Check incoming motion sensor data.
- Check all other settings in the "System Setup" dialogues.

System check / preparing survey start

- Switch on the transmitter [F4] (make sure the transducer is below water level).
- Set the range appropriate to find the seafloor.
- Optimize the gain settings for both channels based on the seabed return's amplitude.
- Optimize the range settings based on water depth and required / expected penetration.
- Optimize frequency, pulse length (and gain) settings.
- Check and optimize the signal processing settings for online visualisation.
- Check the settings for annotation, profile number and marker counter.
- Check data record [F5].