



HYPACK
a xylem brand

Side Scan Drivers

Interfacing Notes

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Revision History:

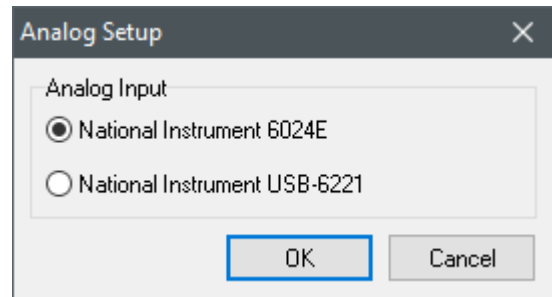
- ⤴ 2/8/2018 Updated images. Added missing notes for Benthos C3D, Edgetech 4600/6205, GeoAcoustics GeoSwath, and Klein 3500.
- ⤴ 6/29/2016 Added Kongsberg PulSAR
- ⤴ 9/17/2015 Added SonarTech SonarBeam S-150 and Marine Sonic Sea Scan Arc Explorer
- ⤴ 3/13/2014 Review and update. (Many post-09 updates were not listed here)
- ⤴ 3/13/2009 Internal trigger option for USB analog sidescan.
- ⤴ 10/9/2008 USB Analog sidescan interface.
- ⤴ 7/02/2008 Added GeoAcoustics DSSS and Benthos 1624/1625 sections.
- ⤴ 3/21/2008 Updated Klein section, added 3900 notes.
- ⤴ 5/02/2005 Add Edgetech 272-T/TD notes.
- ⤴ 3/15/2005 Add Edgetech 4100 notes.
- ⤴ 8/31/2004 Add CMAX CM-2 Notes.

Analog Sidescan

Driver providing 2-channel sidescan information from analog input. A separate program (AscanUSB.exe) is run automatically to sample the ping trigger and digitize the analog inputs. The digitized data are passed to Sidescan Survey through shared memory.

Setup Form:

The setup form allows you to select the analog input device. The NI 6024E is a PCMCIA device which works fine in Windows XP and earlier but is not supported by National Instruments in Vista, and therefore cannot be used in HYPACK® under Vista. The NI USB-6221 is a USB device which should work in all Windows versions supported by HYPACK®.



Additional Setup:

Clicking “Analog Sidescan Monitor” (on the taskbar) during Sidescan Survey will show the following form for sidescan configuration on the fly.

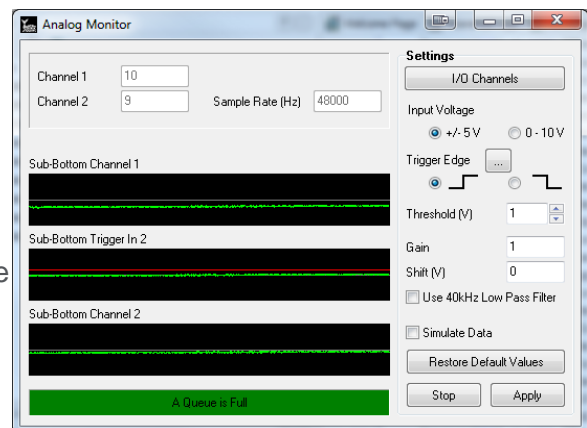
Input: Select one of the voltage range options.

Trigger: Ping is on low to high or high to low transition of the trigger signal.

Gain: Gain constant (voltage multiplier).

Threshold: This is the A/D count level at which triggering occurs.

Test: Simulate data provides a dummy amplitude time series for each channel.



Connection:

Connected via a National Instruments multifunction I/O device – PCI board, PCMCIA card or USB. The device is plug and play – no configuration required in Sidescan Hardware.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Notes:

See Appendix A: Analog Sidescan Interfacing.

Benthos 1624/1625

Driver for 1624/1625 sidescans with control.

Setup Form:

None.

Connection:

Uses a TCP network connection. According to Benthos documentation, the IP address of the system should always be 192.168.0.17. It uses port 5009 for ping data and 5010 for telemetry. The driver is hardcoded to these ports so the port field in setup is ignored.

Sonar Head Offsets:

For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

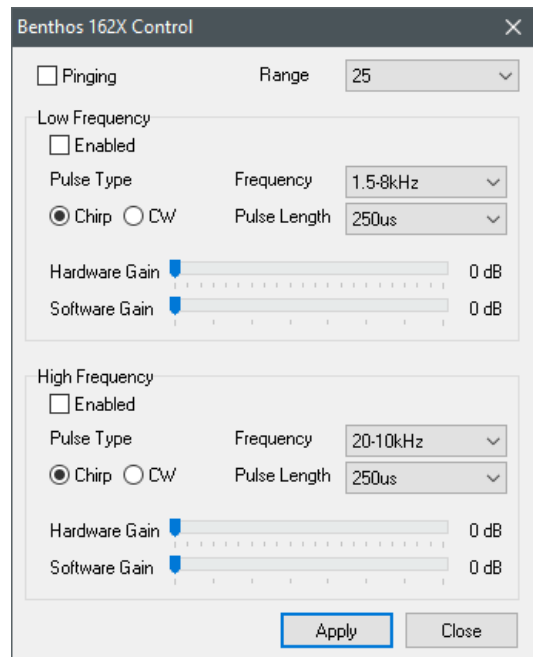
All Other Offsets: Enter 0.

Online Sonar Control:

The control functions are available under Tools Menu, Sidescan Device Control. The pulse type, length, and frequency can be changed as well as hardware and software gain (on the Benthos side).

Notes:

The telemetry data stream may include pressure. This is displayed in the towfish sensor window, but is also converted to depth.



Benthos C3D

Sidescan Survey driver for the C3D Multibeam / Sidescan device. Provides multibeam soundings, beam intensity values and sidescan.

Connection:

All data is via a network interface. Internet address was pre-defined in previous driver version (pre HYPACK 2008). Now, internet address is configurable. Typically, it will be 127.0.0.1, but it could be different if the C3D Control Panel is run on a different computer. Port numbers are hard-coded in the driver so the 'port' field is ignored. However, note that the port number used is different for pole-mounted and towed systems so be sure to set the 'On Towfish' option in Hardware correctly.

Setup Form:

See HYSWEEP setup notes.

Offsets – Sonar Heads 1 and 2:

Starboard: Sonar head locations starboard of **boat center**.

Forward: Sonar head locations forward of **boat center**.

Vertical: Sonar head locations relative to waterline (positive).

Yaw, Pitch, Roll: Sonar head rotations - enter values determined by patch testing.

Latency: Enter 0.

Notes:

At some point in 2008, Benthos changed how the C3D reports timing information. C3D users should make sure their sonar is up to date with Benthos and use HYSWEEP.exe/swpware.exe version 9.0.9 or later to be sure pings are time tagged properly.

	Port	Starboard
<input checked="" type="checkbox"/> Pinging		
Range Setting (Meters)	25	
<input checked="" type="checkbox"/> Auto Gain		
RX Gain	6	6
Absorption	0.00	0.00
Spreading Loss	0	0
Buttons	Send All	Close

CMAX CM-2

Sidescan Sonar driver using COM port for control and analog interface for input.

Connection:

There are two connections. Sidescan signal and trigger use the analog interface (See Analog Sidescan above). Other information exchange (control / status) is through a COM port - 4800 baud, 8 data bits, 1 stop bit, no parity.

COM offset is configurable within the CM-2. HYPACK expects the following message:

S,RangeFreqCode,Altx0.1m<CR>

Refer to the CM-2 manual for further details.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

The standard control functions (ping on/off, range, SV and frequency selection) are available under Tools Menu, Sidescan Device Control. In addition:

Gain Hold: When selected, holds the current towfish gain settings. When deselected, reverts to auto-gain.

Shallow Mode: Allows towfish operation in 1.5m water or less.

C-Max Control

Pinging

Range Setting (Meters) Sound Velocity (m/sec)

50 1500.0

Frequency

Low frequency High frequency

Gain Hold Shallow Mode

Apply Close

C-MAX CM-2 (USB)

Sidescan Sonar driver using USB interface for control and data.

Connection:

No configuration is needed for the USB interface.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

The standard control functions (ping on/off, range, SV and frequency selection) are available under Tools Menu, Sidescan Device Control. In addition:

Gain Hold: When selected, holds the current towfish gain settings. When deselected, reverts to auto-auto-gain.

Shallow Mode: Allows towfish operation in 1.5m water or less.

Notes:

- If having trouble starting up, stop the sidescan survey program for one minute then restart. If trouble persists, stop the program, cycle power at the CM-2 control box, then restart the program.
- A USB driver, available through C-MAX, is required for this interface.

C-Max Control

Pinging

Range Setting (Meters) Sound Velocity (m/sec)

50 1500.0

Frequency

Low frequency High frequency

Gain Hold Shallow Mode

Apply Close

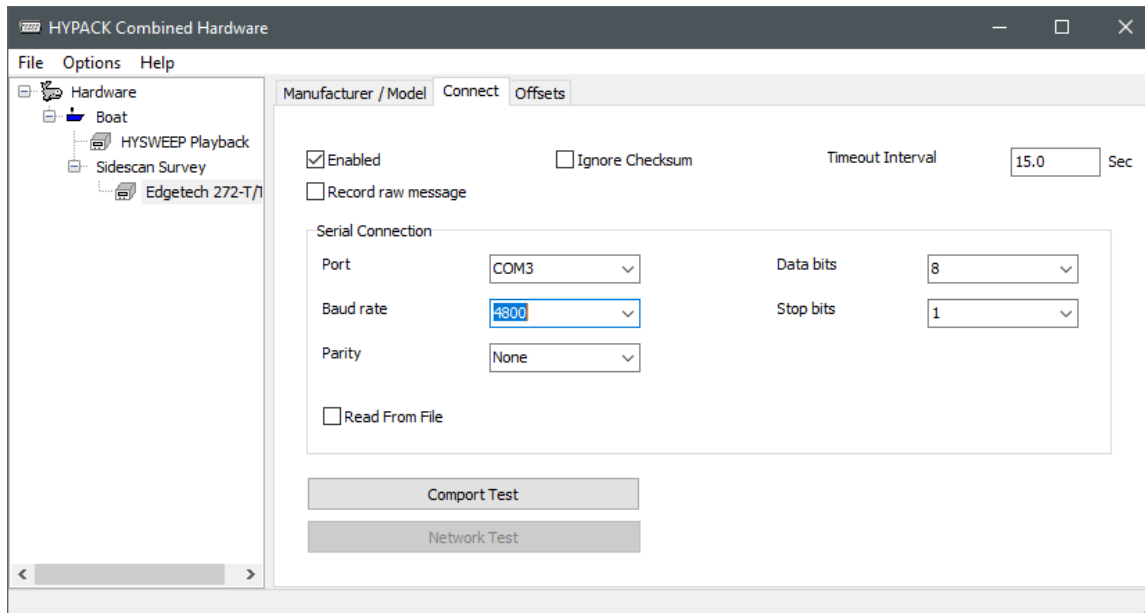
Edgetech 272-T/TD

Driver for Edgetech 272 sidescan. Interface is via the ACI (Analog Control Interface). Sidescan input is via A/D card (see analog sidescan above). Control is via RS232 COM port.

Connection:

Select COM port through which the control messages are output.

Analog inputs are configured in the ASCAN.EXE program (Analog Sidescan Monitor) which runs minimized when this driver is used.



Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

Identical to Edgetech 4100 driver.

Notes:

See "Analog Sidescan" driver and Appendix A to configure analog inputs.

Edgetech 4100

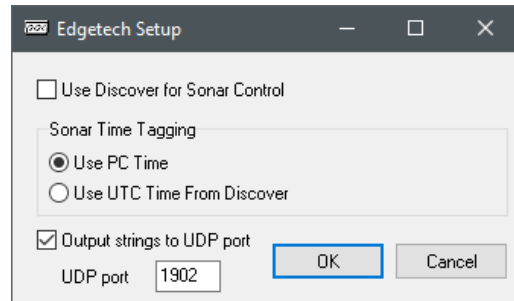
Replaces Edgetech 4100 topside program. The 4100 system consists of the 272 towfish and the 560 control PC, running Edgetech “Discover” software. The HYPACK driver replaces Discover for display, data logging and real-time controls.

Setup Form:

Use Discover for Sonar Control: By default, HYPACK issues 4100 control commands. Users who want advanced sonar control (trigger divisors for example) should check this and allow Discover to control the sonar. HYPACK will still display and log sidescan.

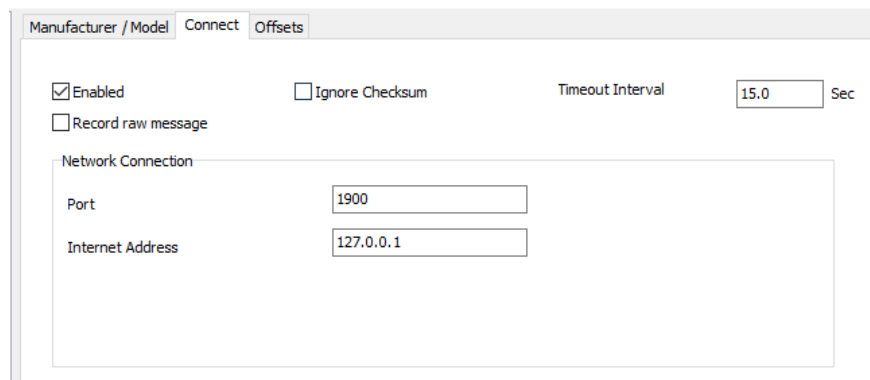
Use PC Clock: Less accurate time tagging but does not require time synchronization. Good enough unless you have very accurate timing requirements.

Use UTC Time From Discover: More accurate but requires synchronization of HYPACK and Discover to UTC time.



Connection:

The HYPACK driver connects to the Edgetech program running on the same PC. Network settings are given in the screen shot.



Sonar Head Offsets:

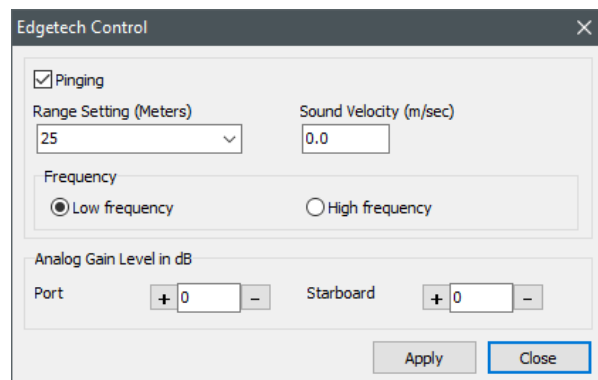
Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

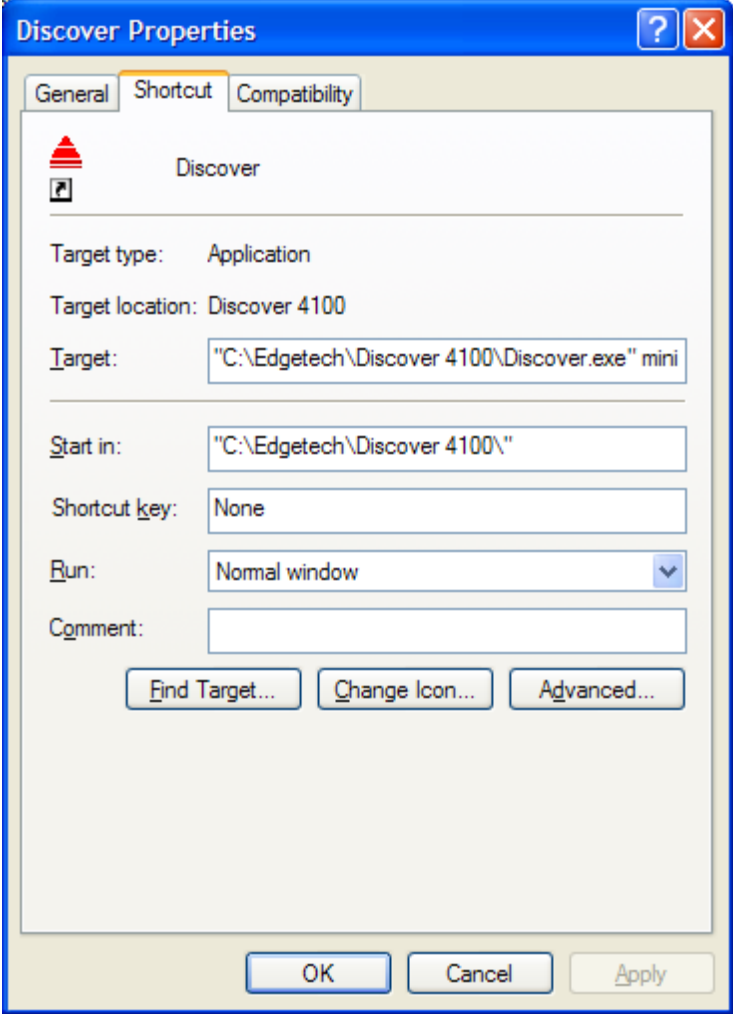
The standard control functions (ping on/off, range, SV and frequency selection) are available under Tools Menu, Sidescan Device Control. In addition:

Analog Gain Levels: Adjust analog gains from minus 12 to plus 12 dB.



Notes:

- To have HYPACK Max start the Discover program automatically, you must create a shortcut in the HYPACK folder. Shortcut name must be Discover.lnk. Example shortcut:



Edgetech 4125/4200/4300

Driver for EdgeTech 4200 system. May work with other systems (4150 for example). EdgeTech's Discover program runs in combination with HYPACK (see 4100 description above).

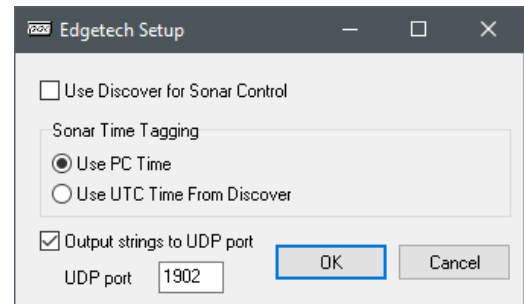
Setup Form:

Use Discover for Sonar Control: By default, HYPACK issues 42100 control commands.

Users who want advanced sonar control (trigger divisors for example) should check this and allow Discover to control the sonar. HYPACK will still display and log sidescan.

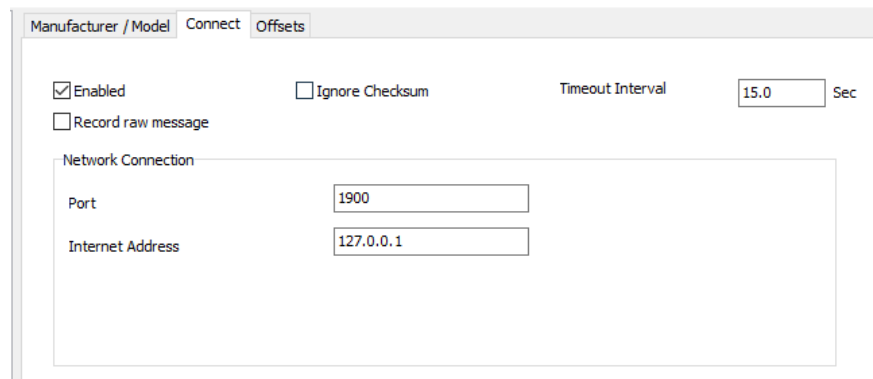
Use PC Clock: Less accurate time tagging but does not require time synchronization. Good enough unless you have very accurate timing requirements.

Use UTC Time From Discover: More accurate but requires synchronization of HYPACK and Discover to UTC time.



Connection:

Network setting when running HYPACK and Discover on the same computer are given in the screen shot at right.



Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

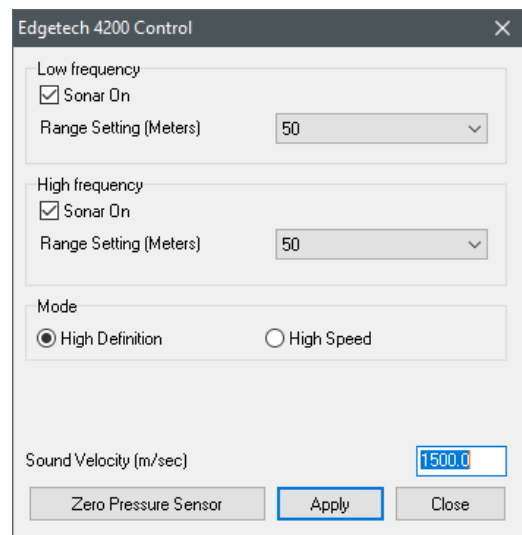
All Other Offsets: Enter 0.

Online Sonar Control:

Sonar controls are available under Tools Menu, Sidescan Device Control. The 4200 driver is capable of display and logging of both frequencies simultaneously.

Notes:

Discover is typically run on the same computer as HYPACK, although it's not required. The fish I.P. Address in Discover (Configuration menu, Network) is 192.9.0.101, Port 1700 in at least one installation.



Edgetech 4600/6205

HYSWEEP driver for the Edgetech 4600 interferometer. Provides multibeam soundings, beam intensity, beam quality, and sidescan imagery.

There is also a sister driver to read navigation from Edgetech in HYPACK called nav4600.dll. This allows all data from Edgetech to be timetagged **by** Edgetech.

Connection:

All data is via a network interface (TCP). Set the Internet Address to the IP of the multibeam. Set the port to 1900--the control port. The driver also uses port 1901 for data. The nav4600.dll driver mentioned above should be set to port 1902. Edgetech broadcasts navigation only on this port.

Offsets:

Starboard: Sonar head locations starboard of **boat reference**.

Forward: Sonar head locations forward of **boat reference**.

Vertical: Sonar head locations relative to waterline (positive).

Yaw, Pitch, Roll: Sonar head rotations - enter values determined by patch testing.

Latency: Enter 0.

Notes:

GeoAcoustics Digital Side Scan

Driver for GeoAcoustics Digital Side Scan system. GeoAcoustics' GeoUTS program runs in combination with HYPACK. GeoUTS should have its 'Processing Unit' setting set to "NEW-usethis". Expect the name of this setting to change. (Other software interfaces with this system differently so there are several options here...)

Setup Form:

None.

Connection:

Uses a TCP network connection. IP should be set to the IP address of the system using port 502.

Sonar Head Offsets:

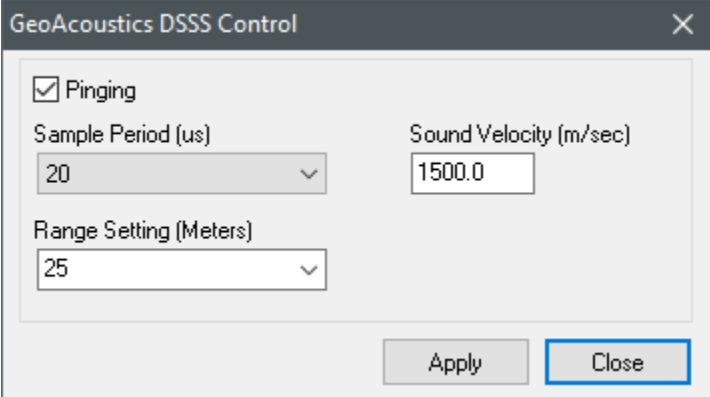
Forward / Starboard: Enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

Sonar controls are available under Tools Menu, Sidescan Device Control. The range and sample period can be adjusted.

Notes:



The screenshot shows a dialog box titled "GeoAcoustics DSSS Control" with a close button (X) in the top right corner. The dialog contains the following controls:

- A checked checkbox labeled "Pinging".
- A "Sample Period (us)" dropdown menu with the value "20" selected.
- A "Sound Velocity (m/sec)" text input field with the value "1500.0".
- A "Range Setting (Meters)" dropdown menu with the value "25" selected.
- "Apply" and "Close" buttons at the bottom right.

GeoAcoustics GeoSwath

Sidescan driver for the GeoSwath multibeam / sidescan device. Provides multibeam soundings, beam intensity values and sidescan imagery.

Setup Form:

See HYSWEEP notes.

Connection:

All data is via a network interface. Internet address can be left as 127.0.0.1. Use network port 5001. In 2010, the filtering features from the IFFilter program are built into HYSWEEP so this program is no longer needed for real-time operation.

Offsets - MRU:

Starboard: MRU location starboard of **boat reference**.

Forward: MRU location forward of **boat reference**.

Vertical: MRU location relative to waterline (**positive below**).

Yaw, Pitch, Roll: Enter MRU calibration offsets if not entered elsewhere.

Latency: Enter 0.

Offsets - Gyro:

Starboard, Forward, Vertical: Enter 0.

Yaw: Typically 0.

Pitch, Roll, Latency: Enter 0.

Offsets – Sonar Heads 1 and 2:

Starboard: Sonar head locations starboard of **boat reference**.

Forward: Sonar head locations forward of **boat reference**.

Vertical: Sonar head locations relative to waterline (positive).

Yaw, Pitch, Roll: Sonar head rotations - enter values determined by patch testing.

Latency: Enter 0.

Notes:

- Two computers are required; One runs GeoSwath +, which is the control program. The other runs HYPACK / HYSWEEP. Communication is over the Ethernet cable.
- The computers must be time synchronized. This is done by time synchronizing both to GPS time (requiring a HYPACK 1PPS box).
- in HYSWEEP 10.0.13 and later, the driver supports the 500kHz GeoSwath as well. It will attempt to detect the frequency, but you can force this mode by setting Geo500kHz=1 in the section for the GeoSwath of your HYSWEEP.ini.

HYPACK Mobile

Provides information from the first HYPACK Survey mobile - typically the sidescan towfish.

- Towfish position and position time.
- Towfish heading – actually, course over ground.

Connection:

None required because data is exchanged through shared memory.

Offsets – Antenna:

Starboard, Forward, Vertical: Enter 0.

Yaw, Pitch, Roll: Enter 0.

Latency: Primary GPS latency (positive).

Offsets – Gyro:

All zero.

Notes:

The HYPACK Mobile driver is only required when the sidescan is installed on a towfish. See Appendix C for the HYPACK Survey setup.

HYPACK Navigation

Provides information from HYPACK Survey primary navigation device – typically GPS.

- Grid position and position time.
- GPS heading and speed.

Connection:

None required because data is exchanged through shared memory.

Offsets – Antenna:

Starboard: Antenna position starboard of **boat reference**. When the sidescan sonar is mounted directly to the boat, the **boat reference** point is the mounting location. When the sonar is towfish mounted, the **boat reference** point is the attachment point of the towfish cable.

Forward: Antenna position forward of **boat reference**.

Vertical: Antenna height relative to the waterline. This is a negative number when the antenna is above water.

Yaw, Pitch, Roll: Enter 0.

Latency: GPS latency (positive).

Offsets – Gyro:

All zero.

Notes:

If sidescan is installed on a towfish, the present driver (HYPACK Navigation) is used for display only. If sidescan is installed on the main vessel, the present driver is used for sidescan positioning. See Appendices B and C.

Imagenex Yellowfin

Driver for the Imagenex Yellowfin sidescan sonar.

Connection:

Network interface. Yellowfin control box has fixed IP Address 192.168.0.2 and uses port 4040. The HYPACK PC must use a compatible IP address; 192.168.0.3 for example.

Note: The Yellowfin control box does not respond to ping commands.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

The standard control functions (run/standby, range, SV and frequency selection) are available under Sidescan Controls, Survey tab.

In addition:

Data Gain: Compensation for cable length.

Gain Balance: Use to bias brightness to port or starboard side in 0.1 dB steps.

Notes:

Yellowfin Control

Pinging

Range Setting (Meters) 50 Sound Velocity (m/sec) 1500.0

Frequency

260 khz 330 khz 820 khz

Data Gain 50 Port (dB) 0.0 Gain Balance Stbd (dB) 0.0

Apply Close

Imagenex Sportscan

Driver for the Imagenex Sportscan sidescan sonar.

Connection:

COM Interface. The Sportscan may be connected to any COM port, but COM parameters are fixed at 115200,n,8,1. Because polling is required, Sportscan data will not show up in the COM test even when the interface is working properly.

The HYPACK connection will normally replace the connection to the Imagenex program. Input to both programs is possible with a split cable.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

The standard control functions (run/standby, range, SV and frequency selection) are available under Sidescan Controls, Survey tab.

In addition:

Start Gain: Main gain control.

Port Gain Balance: To brighten / darken the port side scan.

Starboard Gain Balance: To brighten/darken the starboard side scan.

Pulse Length: Select the transmitter pulse length.

Notes:

Screenshot of the Sportscan Control dialog box. The dialog has a title bar "Sportscan Control" and a close button. It contains several controls:

- Pinging
- Range Setting (Meters): 15
- Sound Velocity (m/sec): 1500.0
- Frequency:
 - Low frequency
 - High frequency
- Start Gain (0-40 dB): 0
- Pulse Length (usecs): 100
- Port Gain Balance (71-141%): 100
- Starboard Gain Balance (71-141%): 100

Buttons: Apply, Close

Innomar SES

Driver for the Innomar SES with the side scan option.

Connection:

Network Interface. Set the IP address and port number (4001 during testing) of the SES in SS HARDWARE. This is a passive driver; we do not send control commands to the sonar so you must use the Innomar-provided computer for changing range and other system settings.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Notes:

Klein 3000 / 3900 / 5000

Driver for Klein 3000, 3900, and 5000 sidescan sonars.

Connection:

Network interface. Enter the IP Address of the Transceiver Processing Unit (TPU) – 192.168.0.81 in one installation. The port number does not matter. Of course the HYPACK PC IP Address must be set in the range that can communicate with the TPU, i.e., 192.168.0.xxx.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

The standard control functions are available when HYPACK is the master connection to the TPU. Frequency selection is used only for the 3900, which operates on one frequency at a time. The control functions are not available when Klein Sonar Pro is the master and HYPACK is the slave connection. Typically, the master is the first connected to the TPU.

For the system 3000, the despeckle mode is selectable.

Notes:

- **Despeckle Mode** defaults to low. Raising this produces a less grainy image.
- **Total Cable Length** should be set to the total cable length connected to the towfish. Raising this value can also decrease noise in the data.
- **Base Gain** should be set before any TVG is applied in HYPACK. Increase or decrease the base gain to achieve a good signal over the most reflective surface in the survey area, i.e. rock/wreck. This base gain value is applied to the raw data. HYPACK TVG once a suitable base gain level has been selected.
- The **Pressure Sensor values** should be automatically set based on your hardware. It is wise to double check these though.

The screenshot shows the 'Klein Control' window with the following settings:

- Pinging
- Range Setting (Meters): 50
- Sound Velocity (m/sec): 1500.0
- Despeckle Mode: Off, Low, Medium, High
- 3900 Frequency: Low frequency, High frequency
- 5000: High Resolution
- Total Cable Length: < 1000m
- Base Gain (dB): Low: 0, High: 0
- Pressure Sensor: Min Voltage (V): 1.0, Max Voltage (V): 5.0, Max Pressure (psi): 300.0

Buttons: Apply, Close

Klein HydroChart 3500/3500 Deep/4900/D3500TF/UUV-3500

The Klein HydroChart 3500 is an interferometric side scan. It provides bathymetry, side scan, heading, pitch, and roll over a network stream. The driver communicates with the towfish through proprietary DLLs from Klein. The raw bathymetry is run through a processor DLL provided by Klein, then through the HYPACK Interferometry processing chain (see Appendix C).

Connection:

Via a TCP/IP network interface. The towfish IP address should be entered in SIDESCAN HARDWARE. Network port is ignored since the driver uses the Klein DLL for communication.

Setup:

Each system has a custom calibration file provided by Klein. It is recommended that this file be copied into the HYPACK BathyParms folder. This file should be selected on the setup form.

If the system includes an MRU, select the message being reported. This data is sent to HYPACK via the SDFX extension area.

Users have the option of using heading reported from the fish or the boat.

To read navigation from the 3500, ensure the “Send NMEA strings to Survey” box is checked and make a note of the port number. Go to GPS.dll for your vessel, click “Setup”, click “Advanced”, and check off “GLL”. Additionally, under the Survey Connect tab, select “Network”, set the Protocol to “UDP”, set the Role to “Server”, and set the Port to the number you noted earlier. It defaults to 4973.

Notes:

- Uses KleinSDK 12.1
- The HydroChart reports page types: 3501, 3502, & 3503
- 3503 pages are processed through KleinDspEx library to generate 3511 pages

The latest Klein DLL files for bathy products should be copied into the HYPACK root folder along with the "BathyParms" folder provided by Klein. This folder contains configuration information needed by the Klein DLLs. The complete file listing relative to the HYPACK root folder is as follows:

BathyParms\	towfishHC3500.cal	ippcvpx-6.0.dll
V1\		ippcv8-6.0.dll
bathyparms.cal	ippcore-6.0.dll	ippcv7-6.0.dll
V2\	ippcv-6.0.dll	ippcv8-6.0.dll
bathyparms.cal	ippcvp8-6.0.dll	ippcv7-6.0.dll

HydroScan 3500

Calibration File (provided by Klein)

MRU Message

KMS F180 None

POS/MV TSS1

Heading

Fish heading Boat heading

HYPACK Survey NMEA Port

If a GPS is connected to the TPU but not to this machine, NMEA strings will be sent from this port to Survey

Send NMEA strings to Survey

Port 4973

OK

ippi-6.0.dll
ippip8-6.0.dll
ippipx-6.0.dll
ippis8-6.0.dll
ippit7-6.0.dll
ippiv8-6.0.dll
ippiw7-6.0.dll
ipps-6.0.dll
ippsp8-6.0.dll
ippspx-6.0.dll

ippss8-6.0.dll
ippst7-6.0.dll
ippsv8-6.0.dll
ippsw7-6.0.dll
ippvm-6.0.dll
ippvmp8-6.0.dll
ippvmpx-6.0.dll
ippvms8-6.0.dll
ippvmt7-6.0.dll
ippvmv8-6.0.dll

ippvmw7-6.0.dll
KleinDspEx.dll
KleinSonar.dll
libguide40.dll
libiomp5md.dll
mfc100.dll
mfc100enu.dll
mfc100u.dll
msvcp100.dll
msvcr100.dll

Kongsberg PulSAR

Driver for Kongsberg PulSAR sidescan sonar.

Connection:

Network interface. Connection and control of the PulSAR device is handled by the PulSAR software. Connect the device to the computer. Launch the PulSAR software (included with every device). In Hardware, set the IP address to 127.0.0.1 and port to 5000. Start pinging in the PulSAR software and launch Sidescan Survey.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

The option to Connect and Disconnect are presented to the user in Sidescan Survey. All other control is done through the PulSAR software.

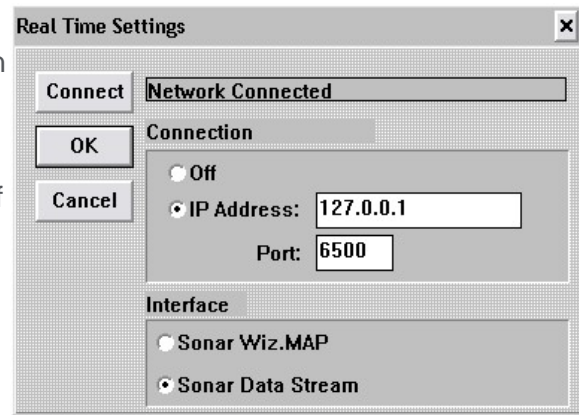
Notes:

Marine Sonic Sea Scan

Driver for Marine Sonic sidescan sonars that use their Sea Scan software for communication.

Connection:

Network interface for data, serial connection for control. Sea Scan uses UDP for communication. In Sea Scan, choose External->Real Time->Settings... from the menu. Set the IP Address to the address of the HYPACK computer and choose a port (the default of 6500 is fine). Set the Interface option to 'Sonar Data Stream'. In SS Hardware, leave IP address as is (unused for UDP connections) and set the port to the same as in Sea Scan.

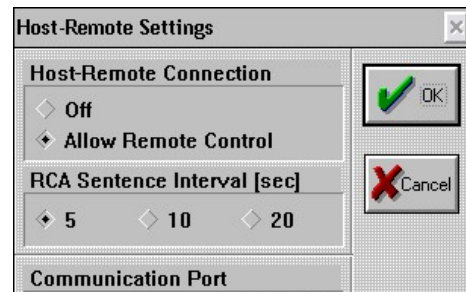


For remote control, choose External->Host-Remote->Settings... from the menu. Select 'Allow Remote Control' and configure the serial port settings.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

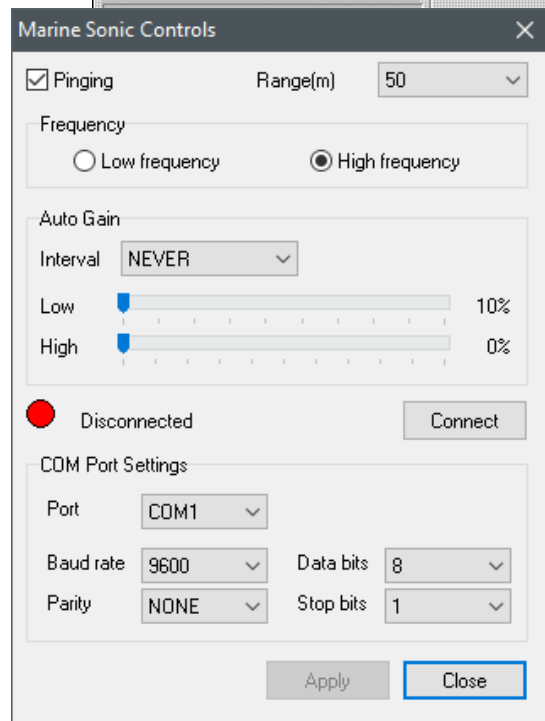
All Other Offsets: Enter 0.



Online Sonar Control:

Standard control functions are available if you also connect to Sea Scan with a serial cable. Configure the serial port settings on the control form and press 'Connect'.

Notes:



Marine Sonic Sea Scan ARC Explorer

Driver for Marine Sonic Sea Scan ARC Explorer sidescan sonar. Driver written by Daniel Tobin in 2015.

Connection:

The S-150 uses a network connection for communication. Connection and communication is done through the Marine Sonic DLLs, so there shouldn't be any setup required to run this device.

Sonar Head Offsets:

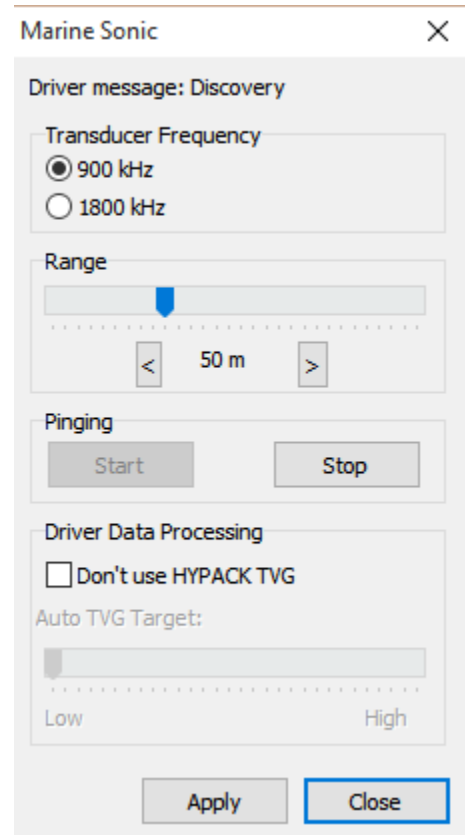
Forward / Starboard: For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

Transducer frequency, range, and an option to start and stop pinging are in the settings. The ARC Explorer offers an option to use TVG provided by the official Marine Sonic DLL with a slider to adjust the TVG target. Enabling Marine Sonic TVG disables HYPACK TVG.

Notes:



Marine Sonic Sea Scan HDS

Driver for Marine Sonic HDS. Plug and play USB, nothing special to configure.

Connection:

USB.

Sonar Head Offsets:

Forward / Starboard: For hull mount, enter offsets relative to boat origin. For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Notes:

SonarTech SonarBeam S-150

Driver for SonarTech SonarBeam S-150 sidescan sonar. Driver written by Daniel Tobin in 2015.

Connection:

The S-150 uses a comport for communication. Set the port number to the port the device is connected to and all other settings should be left at their default setting.

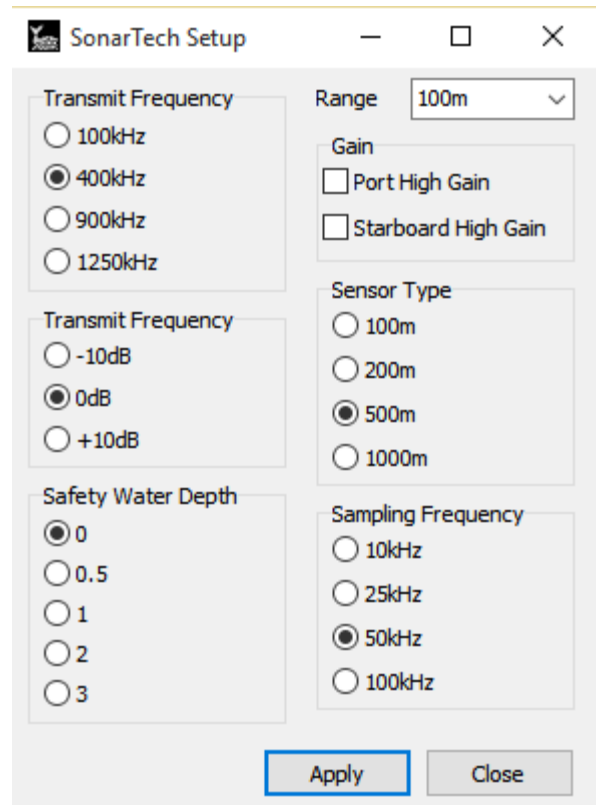
Sonar Head Offsets:

Forward / Starboard: For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

All Other Offsets: Enter 0.

Online Sonar Control:

Controls for setting many different options are available.



The image shows a screenshot of the "SonarTech Setup" dialog box. The window title is "SonarTech Setup" and it has standard minimize, maximize, and close buttons. The dialog is organized into several sections:

- Transmit Frequency:** A group box containing four radio buttons: 100kHz, 400kHz (selected), 900kHz, and 1250kHz.
- Range:** A dropdown menu currently set to "100m".
- Gain:** A group box containing two checkboxes: "Port High Gain" and "Starboard High Gain", both of which are unchecked.
- Transmit Frequency (dB):** A group box containing three radio buttons: -10dB, 0dB (selected), and +10dB.
- Sensor Type:** A group box containing four radio buttons: 100m, 200m, 500m (selected), and 1000m.
- Safety Water Depth:** A group box containing five radio buttons: 0 (selected), 0.5, 1, 2, and 3.
- Sampling Frequency:** A group box containing four radio buttons: 10kHz, 25kHz, 50kHz (selected), and 100kHz.

At the bottom of the dialog, there are two buttons: "Apply" and "Close".

TriTech StarFish 450/990

Driver for TriTech StarFish sidescan sonar.

Connection:

The StarFish uses USB for communication. Make sure you have the software drivers for the StarFish installed. These are required for HYPACK to find the sidescan device.

Sonar Head Offsets:

Forward / Starboard: For towfish, enter 0, 0 as offsets are applied to the tow cable driver (TOWCABLE.DLL) in HYPACK survey.

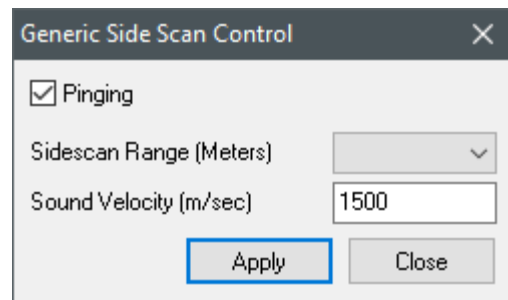
All Other Offsets: Enter 0.

Online Sonar Control:

A basic control is available to toggle pinging as well as changing range and sound velocity.

Notes:

- We have had reports of the Starfish interface box conflicting with Serial-to-USB converters as well as overheating. One customer wraps the box in ice packs before starting the survey day.
- **Regarding 2011 and earlier:** Note that SIDESCAN SURVEY will resend initialization commands to the fish if SURVEY is restarted which may cause the fish to stop sending data for a minute while it reinitializes. We recommend that the timeout setting in SIDESCAN HARDWARE is set to a minute or more to avoid a timeout message in this case.
- **2012 and on:** When support for the 990 was added, the Trittech StarFish drivers use the newer DLL interface from Trittech. Make sure that you have installed the relevant software from Trittech to make sure that you have the latest DLLs on your system.



Appendix A: Analog Sidescan Interfacing

Requires a multifunction I/O device for port and starboard transducer signals + trigger, a cable and a connector block. All are available from National Instruments, along with a CD containing driver software.

National Instruments

11500 North Mopac Expressway,

Austin, TX 78795-3504

TEL: (512) 794-0100

FAX: (512) 683-9300

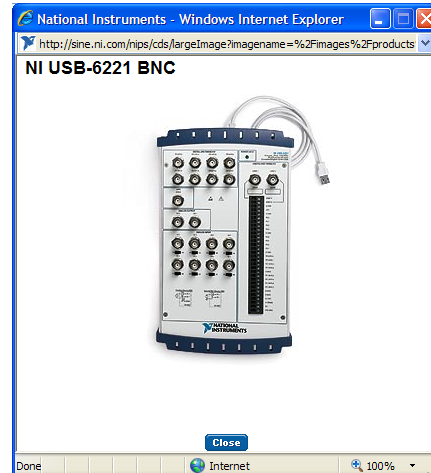
www.ni.com

I/O Board

For Desktop Computers: NI PCI-6023E – PCI Board.

For Notebook Computers: NI DAQ Card-6024E – PCMCIA Card

USB: NI USB-6221 BNC – USB interface.



Cable

For the Desktop PCI Board: SH68-68-EP

For the Notebook PCMCIA Card: SHC-68-68-EP

USB: Included.

Connector Block

For PCI and PCMCIA: SCB-68.

USB: Included.

Connections (PCI and PCMCIA)

To connect the three inputs – (1) port signal, (2) starboard signal, (3) trigger.

<u>Input</u>	<u>Connector Block</u>
1 Signal	68 (ACH0)
1 Ground	67 (AIGND)
2 Signal	33 (ACH1)
2 Ground	32 (AIGND)
3 Trigger	65 (ACH2)
3 Ground	64 (AIGND)

Note: The trigger wiring below is obsolete as of HYPACK version 2.12A.

3 Signal	10 (PFI1/TRIG2)
----------	-----------------

3 Ground

9 (DGND)

11 (PFI0/TRIG1) connected to

47 (DIO3) for internal trigger test mode.

Connections (USB)

Connect coax cables: AI0 = Port signal, AI1 = Starboard signal, AI2 = Trigger Input, AOO = Trigger Output.

Hardware / Software Installation (PCI)

1. Before installing the NI-DAQ software, install the PCI-6023E board in a spare PCI slot.
2. Start the computer and cancel the New Hardware Wizard.
3. Install the NI-DAQ software from CD then restart the computer.
4. Upon restart, the PCI-6023E is automatically recognized and configured.

Hardware / Software Installation (USB)

No special instruction; Just install the National Instruments drivers and hardware per their recommendation.

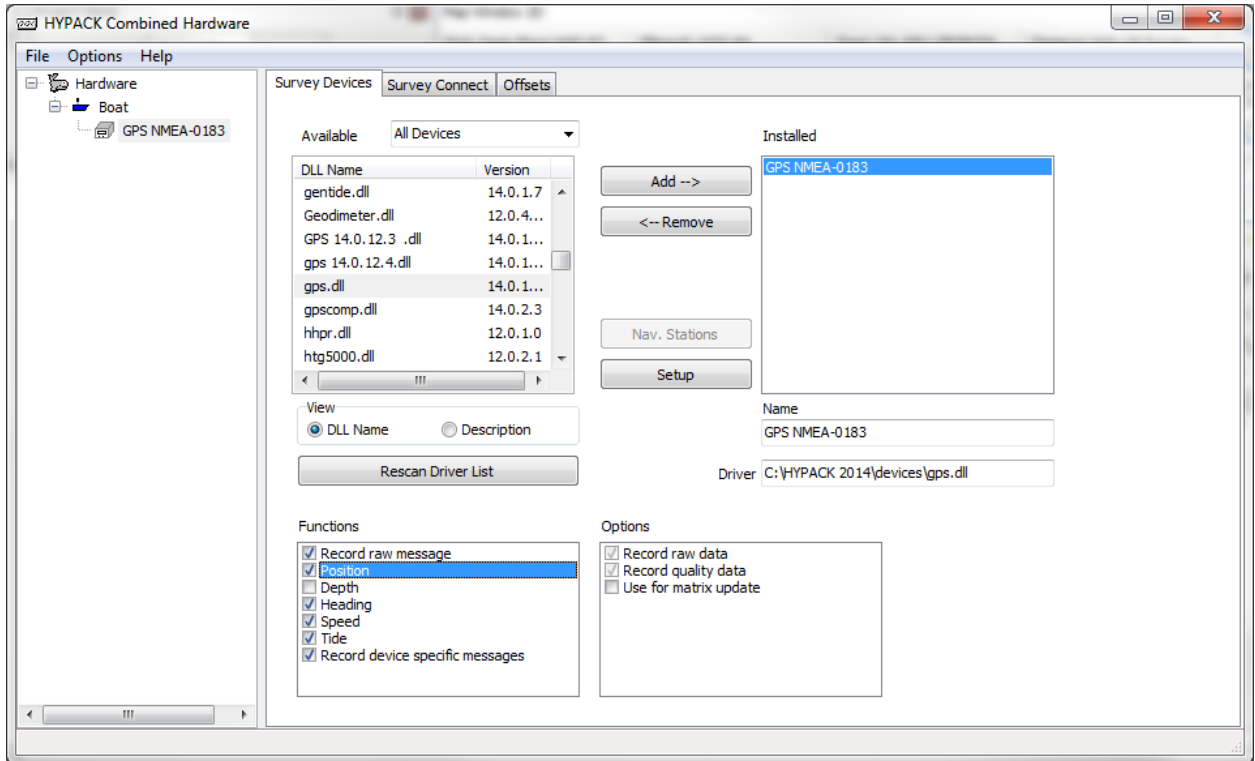
Trigger Options

External Trigger: The sonar generates the trigger which is wired into AI2.

Internal Trigger: HYPACK generates the trigger. It is wired to the sonar and to AI2.

Appendix B: HYPACK Hardware Setup – Boat Mounted Sonar

When sidescan sonar is mounted directly on the boat, HYPACK Survey requires only a position driver. The driver takes in GPS position and heading (gps.dll, etc.) and calculates sonar head position.



The best way to deal with offsets is to define the sonar location as the boat origin and enter the offsets **from** the sonar **to** the GPS antenna.

If more accurate heading is available (e.g., gyro), add the appropriate driver in HYPACK Hardware. Nmea.dll reads the \$HDT message sent by most gyros.

With boat mounted sonar, the Sidescan Survey program gets sonar position from the "HYPACK Navigation" driver – see above.

Appendix C: HYPACK Hardware Setup – Towfish Mounted Sonar

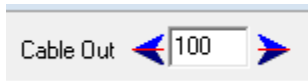
When sidescan sonar is mounted on a towfish, HYPACK Survey requires two position drivers – (1) the position of the Primary Survey Vessel comes from GPS and (2) the position of the first HYPACK Mobile (Towfish) is calculated from boat position and towfish cable out.

We select the boat origin as the point where the towfish cable is attached to the boat.

Primary Survey Vessel: Takes in GPS position and heading (gps.dll). Enter offsets from the cable attachment point to the GPS antenna.

HYPACK Mobile (Towfish): Calculates towfish / sonar position. The recommended driver is towfish.dll, which you will install on the first HYPACK mobile. Offsets are zero. The setup dialog for towfish.dll is shown to the right. Unless you have good reasons otherwise, setup the driver as shown.

During survey, the amount of cable out can be adjusted resulting in a changed layback.



With towfish mounted sonar, the Sidescan Survey program gets sonar position from the “HYPACK Mobile” driver – see above.