Hydrophone Specification

Part Number:	BII-7181FG	BII-7181PG
Sensitivity at 1 kHz:	-221.5 + Preamp Gain. Variation: ± 2 dB.	
Free-field Voltage Sensitivity:	Refer to Graph of **FFVS vs. Frequency**.	
-3dB Beam Width:	Refer to Graph of **Directivity Pattern**.	
Usable Frequency in Water:	1Hz ~ 1MHz at ±4dB V/µPa.	
Usable Frequency in Air:	1Hz ~ 20kHz at -3dB V/µPa.	
Bespoke Preamp Gain (dB):	Fixed Gain: Default 40 dB, 0 to +40 dB available.	Digitally Programmable Gain Preamp: 20, 40, 60 dB.
Gain Selection Voltage:	N/A	CMOS/TTL Compatible. Logic Low 0: Gain Selection Wire to COM or 0 to +0.8 VDC. Logic High 1: Gain Selection Wire Open or +2.4 VDC to Vs. Vs: Power Supply Voltage; COM: Power Supply Common.
Built-in Bandpass Filter:	1. Default: -3 dB bandwidth 8 Hz to 2 MHz. 2. Bespoke, specify when ordering.	1. Default: -3 dB bandwidth 8 Hz to 1 MHz. 2. Bespoke, specify when ordering.
Maximum Output Vomax:	(Supply Voltage - 4) Vpp	(Supply Voltage – 3.4) Vpp
Overload Pressure Level:	20*log(Vomax/2.828) - Sensitivity, in dB µPa.	
Output Type:	Single Ended.	
Acceleration Sensitivity:	124.6 dB re µPa/(m/s²)	
Maximum Operating Depth:	50 m and limited by the cable length if the cable has wire leads or a non-waterproof connector.	
Mounting Options:	1. Free Hanging (FH) 2. Free-hanging with Male Underwater Connector (FHUWC) 3. Thru-hole Mounting with Single O-ring (THSO) 4. Thru-hole Mounting with Double O-ring (THDO) 5. Bolt Fastening Mounting (Plastics) (BFMP) 6. Bolt Fastening Mounting (Stainless Steel) (BFMSS) Please refer to online document AcousticSystem.pdf for a complete list of Mounting Options and more details.	
Cable:	Four Conductor Shielded Cable (SC)	Six Conductor Shielded Cable (SC) or Cable Bundle
Cable Length:	1. Default: 10 m. 2. Custom-fit up to 200m.	
Connector:	1. Default: Wire Leads (WL) 2. Male BNC (BNC) (Max. Diameter Φ14.3 mm). 3. SMA (Plug, Male Pin) (SMA), Voltage Rating: 335 V_{RMS} Continuous. (Max. Diameter Φ9.24 mm). 4. SMC (Plug, Female Socket) (SMC), Voltage Rating: 335 V_{RMS} Continuous. (SMC) (Max. Diameter Φ6.4 mm). 5. 1/8" (3.5mm) TRS Plug (TRS35) (Max. Diameter Φ10.5 mm). 6. XLR (pin) (XLR) (Max. Diameter Φ20.2 mm). 7. MIL-5015 Style (pin) (5015) (Max. Diameter Φ30 mm with 3 contacts). 8. LEMO (Plug Male Pins) (LEMO) (Max. Diameter Φ9.5 mm with 3 contacts). 9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter Φ21.5 to Φ35 mm). 10. +9VDC Battery Snap (BS) (Exclusive to preamplified hydrophone) 11. Customized, buyer specifies the connector. (Custom) Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are not waterproofed.	
Current (Quiescent):	8 mA	10 mA
Supply Voltage Vs:	+8.5 to +30 VDC	+8.2 to +30 VDC
Suggested DC Supply:	+9VDC Battery, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included. DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage. DO NOT use switching mode DC power supply.	
Size:	Sensing Element: ΦDxL=Φ4.6x8mm; Solid Support: ΦDxL=Φ6.4x38.1mm; Preamp Housing: ΦDxL=Φ21x40mm. Varies with options.	
Weight:	560 grams with 10 m cables, Varies with options.	
Operation Temperature:	-10 °C to +60 °C or 14 °F to 140 °F.	
Storage Temperature:	-20 °C to +60 °C or -4 °F to 140 °F.	

Sound Measurement in Air: The hydrophones can be used to detect sounds in air. Receiving sensitivity in air is same to the one in water in low frequency range.

Wiring Information of Hydrophones with Fixed-gain Preamps:

Wiring of Single Ended Output:	**Wire Leads**	**BNC Male/SMA/SMC and 9V Battery Snap**	**Underwater Connector**	**XLR Plug and 9V Battery Snap**	**TRS Plug and 9V Battery Snap**
+VDC	Red	Female Snap	Pin 3	Battery Female Snap	Battery Female Snap
Common	Black	Male Snap	Pin 1	Battery Male Snap	Battery Male Snap
Signal	White	Center Pin or Contact	Pin 2	XLR Pin 2	TRS Tip
Signal Common	Blue, Green, or Yellow	BNC/SMA/SMC Shield	Pin 4	XLR Pin 1 and Pin 3	TRS Ring and Sleeve
Shielding	Shield	N/A	N/A	XLR Metal Shell	N/A

Wiring Information of Hydrophones with Two-bit Programmable Gain Preamps:

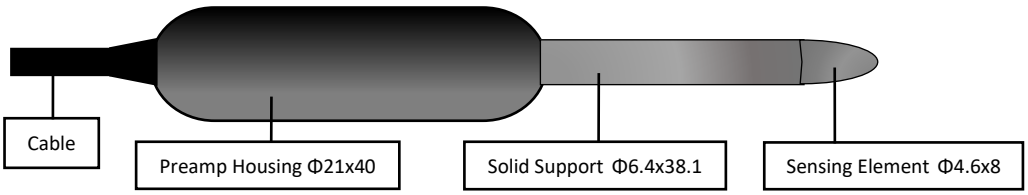
Wiring of Single Ended Output:	**Wire Leads**	**9V Battery Snap and BNC Male/SMA/SMC**	**Underwater Connector**	**XLR Plug + 9V Battery Snap**	**TRS Plug + 9V Battery Snap**
+VDC	Red	Battery Female Snap	Pin 3	Battery Female Snap	Battery Female Snap
Common	Black	Battery Male Snap	Pin 1	Battery Male Snap	Battery Male Snap
Digital Common		Black		Black	Black
Digital A1 (Gain Selection)	Yellow or Brown	Yellow or Brown	Pin 5	Yellow or Brown	Yellow or Brown
Digital A0 (Gain Selection)	Blue	Blue	Pin 6	Blue	Blue

Output Signal	White	BNC/SMA/SMC Center	Pin 2	XLR Pin 2	TRS Tip
Output Signal Common	Green	BNC/SMA/SMC Shield	Pin 4	XLR Pin 1 and Pin 3	TRS Ring and Sleeve
Shielding	Shield	Shield	N/A	XLR Metal Shell	N/A

Selecting Sensitivity FFVS of Two-bit Digitally Programmable

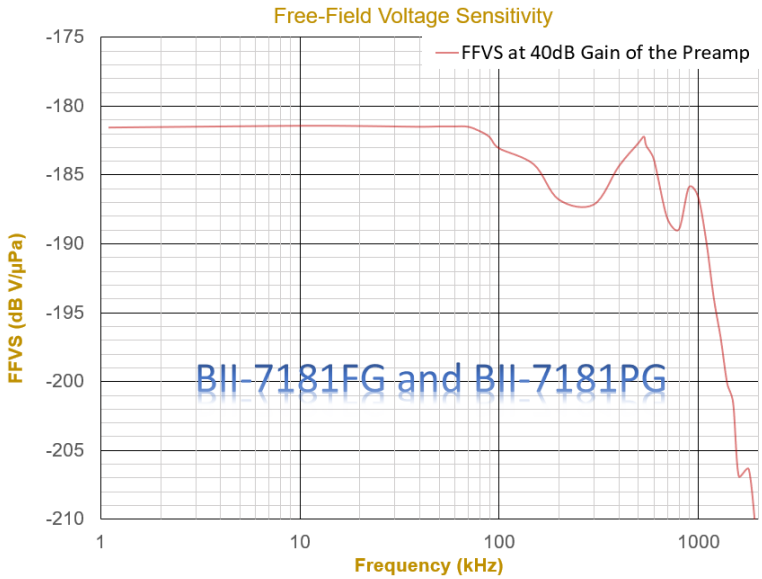
Gain Selection Wire A1	Gain Selection Wire A0	Hydrophone Sensitivity
0 (Logic Low)	0 (Logic Low)	-221.5 + 20 dB V/μPa
0 (Logic Low)	1 (Logic High)	-221.5 + 40 dB V/μPa
1 (Logic High)	0 (Logic Low)	-221.5 + 60 dB V/μPa
1 (Logic High)	1 (Logic High)	-221.5 + 80 dB V/μPa (ONLY for signal frequency ≤ 400 kHz)

Physical Size (Dimension Unit: mm):



Customization of Length Reduction of the Hydrophone: Hydrophone can be made as "L" shape with solid support perpendicular to the housing wall. Appending "L" to the part number (BII-7181FGL or BII-7181PGL) when ordering to specify L-shaped Hydrophone.

Free-field Voltage Sensitivity (Bespoke):



Directivity Pattern: