

# **Ethernet Pipe Profiling Sonar Quick Installation Guide**

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## 1. Introduction

The Ethernet board is designed to provide a 10/100Base-T Ethernet connection to an Underwater Unit. It primarily collects raw acoustic data from the Underwater Unit then digitizes and processes the signal before sending to the host PC via Ethernet.



*Figure 1: Ethernet Board Top Side*



*Figure 2: 1512 Underwater Unit*



*Figure 3: 2512 Underwater Unit*

## 2. Surface Box



Figure 4: Ethernet Surface Box

### 2.1 Quick Start

The following items are required to complete the Ethernet surface box system set up:

- PC
- Pipe Profiler E software CD
- Ethernet cable
- IEC mains lead
- Sonar to surface cable
- Underwater unit (either 1512 or 2512 models)

- (1) Install the Pipe Profiler E software on the PC using the supplied CD.
- (2) Before powering up the system for the first time, ensure that the appropriate mains supply voltage has been selected on the back of the surface box. The AC supply voltage can be selected for either 110V or 240V on the IEC input connector by removing the fuse holder and reinserting it such that the desired voltage points to the white line.



Figure 5: IEC Connector on Back of Surface Box set up for a voltage input of 220 - 240V AC



*Failure to select the correct AC voltage may damage the power supply box*

- (3) Make sure the IEC connector switch is in the off position and connect the IEC mains lead to the surface box. The power LED on the front of the box will remain off.
- (4) Use the sonar to surface cable to connect the underwater unit to the surface box. The surface box connector also features a quadrature encoder interface to display the cable payout distance in the software.
- (5) Connect an Ethernet cable between the surface box and a PC.
- (6) If using a short cable, turn the power supply knob on the front of the surface box to point to either 26V for a 1512 system or 15V for a 2512 system. To allow for longer cables the voltage must be increased depending on the resistance of the power cores.
- (7) Press the IEC connector power switch on the back of the surface box to supply power to the underwater unit. Upon power on the power LED will illuminate and a noise will be heard from the underwater unit as the motor rotates the transducer to a reference position.



*If the underwater unit makes no sound when it is powered on, switch it off immediately and check the power connections to it.*

- (8) Load up the pipe profiler software on the PC. Wait for a sub window to appear with the surface box's serial number in the bottom left of the task bar and a message confirming the underwater unit is connected next to it.

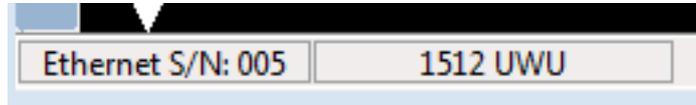


Figure 6: Task bar showing a successfully connected surface box and underwater unit

 If the sub window does not appear and the Ethernet connector LEDs are both flashing on the surface box, suspect a faulty network connection..

- (9) Click on the control panel icon in the sidebar and in the new window select the status tab. Readjust the power supply knob on the front of the surface box to set the supply voltage reading in the software to +26VDC for a 1512 system or +15VDC for a 2512 system. The system is now ready for use.



Figure 7: Control Panel Icon

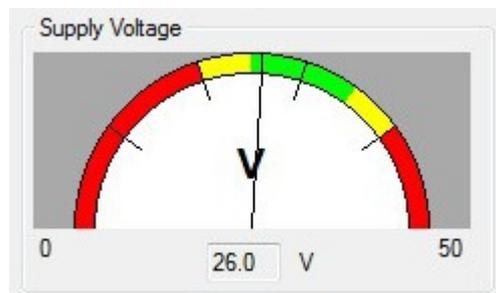
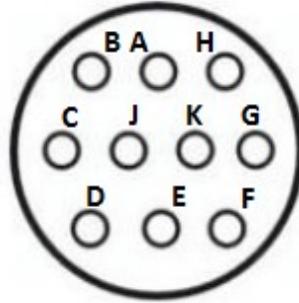


Figure 8: Underwater unit supplied with +26VDC

## 2.2 Connector and Pinout



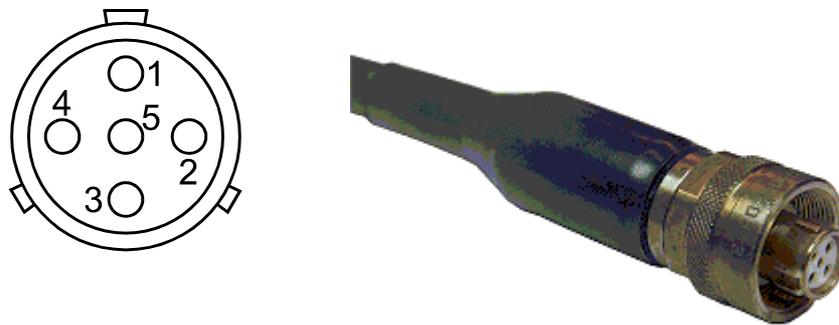
*Figure 9: TT Electronics AB Connectors - AB052100 1210SN00  
 View looking into surface box bulkhead socket*

Surface Box Connector Pinout	
Pin	Function
A	NC
B	Data-
C	Data+
D	V-
E	V+
F	Quadrature Encoder Channel A
G	NC
H	Quadrature Encoder Channel B
J	+5VDC, 200mA max output
K	0VDC

### 3. Underwater Unit

#### 3.1 Connectors

The connector used to mate to the Scanner is a Jupiter Type FEDF10MT05-16-A-110 for the 1512 Underwater Unit or an Amphenol Pattern 105 shell size 14-19 socket female for the 2512 Underwater Unit. The sonar telemetry should be connected to the Ethernet board with the Data +ve to the Data +ve and the Data -ve to the Data -ve. If a coaxial cable is used then the Data +ve should be connected to the inner and the Data -ve to the outer of the coax. If a shielded twisted pair cable is used the Data +ve should be connected to both conductors of the pair in parallel and the Data -ve to the shield/foil/drain wire.



*Figure 10: 05-16 5 pin Jupiter layout  
Pin Layout viewed from rear looking at solder buckets*



*Figure 11: Pattern 105 19 Pin*

### 3.2 Pinout

<b>Underwater Unit Connectors</b>		
<b>U/W Scanner 5 Pin Jupiter</b>	<b>U/W Scanner Pattern 105 19 Pin</b>	<b>Function</b>
1	G	V+
2	C	Data -
3		
4	B	Data +
5	K	V-

## 4. Ethernet Board



Figure 12: Ethernet Board Top Side

### 4.1 Specifications

a) Size	50.8 x 114.3mm
b) Weight	44g
c) Protocol	Ethernet 10/100Base-T
d) Power Requirements	9-36VDC (24VDC nominal) Typ. 2W (quiescent)

### 4.2 Molex – KK 6410 Series

All headers on the PCB are Molex KK 6410 series headers. Pin 1 is the upper most pin when looking down on the header with the friction lock on the left.

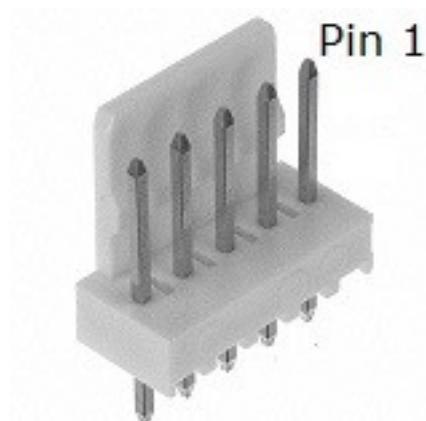


Figure 13: KK 6410 Series  
Molex Connectors.

### 4.3 Operation

The Ethernet board is typically powered from a +24VDC (9VDC - 36VDC) supply connected to PL2 (+24VDC to Pin 5 and 0VDC to Pin 1). PL2 pins 2 and 4 are the Data+ and Data- connections, respectively, that join to the Underwater Unit. The RJ45 Jack (SK2) allows for communication with the Ethernet Board and the Underwater Unit over a 10/100Base-T Ethernet connection.

PL4 is a quadrature encoder interface that enables the cable payout to be displayed by the Pipe Profiler software. Channel A is on pin 1 and channel B is on pin 4. +5VDC is available for the connected quadrature encoder across PL4 pins 2 (+ve) and 3 (-ve), and it is recommended no more than 200mA be drawn from this supply.

 *PL4 pins 2 and 3 provide +5VDC with respect to the voltage on Data- ; not the 0VDC power pin on PL2 pin 1. The manufacturers will not be responsible for the cost of any damage resulting from incorrect connection of the sonar system.*

### 4.4 Pinout

Ethernet Board Pinout		
Designator	Pin	Function
PL2	1	+0VDC Power In
	2	Data+
	3	NC
	4	Data-
	5	+24VDC (9VDC - 36VDC)
SK2		RJ45 Ethernet Jack
PL4	1	Quadrature Encoder Channel A
	2	+5VDC, 200mA output w.r.t. Data- (PL2 Pin 4)
	3	0VDC w.r.t. Data- (PL2 pin 4)
	4	Quadrature Encoder Channel B

## 4.5 Wiring Example

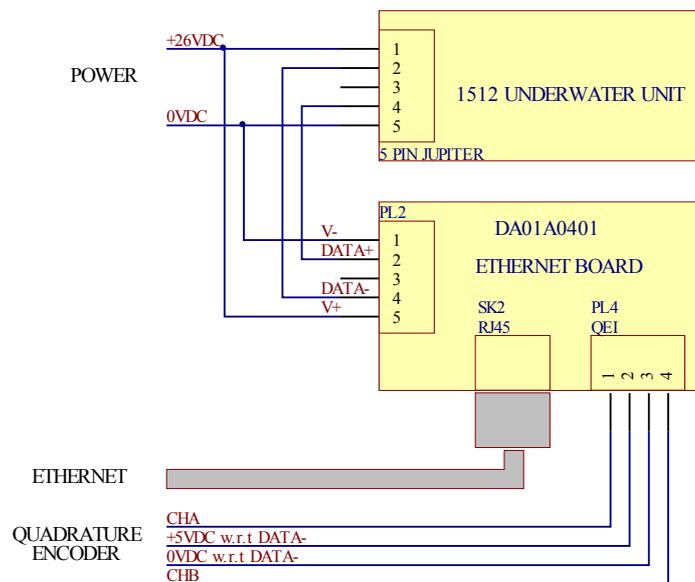


Figure 14: Ethernet Board Wiring Example

The underwater unit and Ethernet board may share the same power supply. The Ethernet board accepts a DC power supply voltage from +9VDC to +36VDC.

The Data+ and Data- connections on PL2 pins 2 and 4 connect to pins 4 (Data+) and 2 (Data-) on the Underwater Unit 5-pin Jupiter connector, respectively.

The RJ45 Jack (SK2) provides a 10/100Base-T Ethernet connection.

PL4 is an optional quadrature encoder interface that allows for the cable payout to be displayed in the Pipe Profiler software.

**i** Please note that the DC voltages on PL4 pins 2 and 3 are with respect to the voltage on Data- (PL2 pin 4) and under no circumstances should be connected to the 0VDC power input on PL2 pin 1.