



SOUNDER 1602  
QUICK START GUIDE  
D101-05756-REV2



For use with Knudsen Sounder 1602  
Part Number: D229-04166

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## 1. Amendment History

<b>Version</b>	<b>Date</b>	<b>Description</b>	<b>Author</b>	<b>Approved By</b>
1.0	01-Dec-2015	Initial Release	Darren Gibson	
2.0	03-Dec-2015	Changed to Word format	Darren Gibson	

## 2. Introduction

### 2.1 About this Manual

This document describes the basic setup and operation of the Knudsen Sounder 1602 Echosounder.

### 2.2 Technical Support

For technical support or to report problems please contact your local representative or:

Technical Support  
Knudsen Engineering Limited  
10 Industrial Road  
Perth, Ontario, Canada  
K7H 3P2

Voice: (613) 267-1165 8:30am to 5:30pm E.S.T. Core hours  
Fax: (613) 267-7085  
E-Mail: [support@knudseneng.com](mailto:support@knudseneng.com)  
WebSite: <http://knudseneng.com/>

### 2.3 Unpacking the Shipment

The Sounder 1602 is securely packed in a custom made rugged shipping case. Please keep the case for any possible return shipments. The standard shipment may contain the following items:

- Sounder 1602 Rackmount Echosounder  
Part Number: D229-04166
- DC Input Power Cable  
Part Number: D219-02250
- USB Communications Cable  
Part Number: D219-05424
- SounderSuite Software Installation CD  
Part Number: D429-04216
- Quick Start Guide – Sounder 1602  
Part Number: D101-05756
- EchoControl Client User Manual  
Part Number: D101-04380
- Cable End Connectors  
(may be installed on transducers)



### 3.0 Description

#### 3.1 System Overview

The Sounder 1602 Echosounder features simultaneous dual channel operation. Each frequency agile channel can be configured between 24kHz and 210kHz with up to 1kW of output power (please confirm with manufacturer on matching transducer specifications prior to changing from factory defaults).

#### 3.2 Physical Characteristics

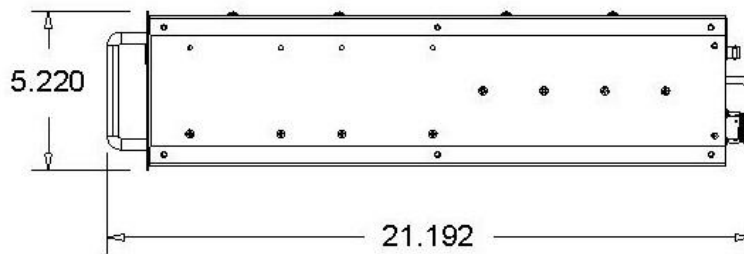
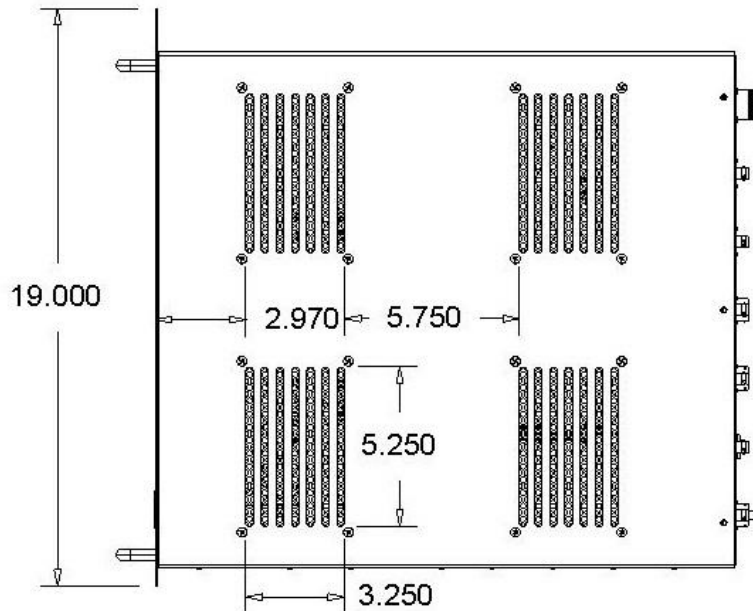
The Sounder 1602 Echosounder is housed in a standard 19” 3U Rack Case. If possible it is recommended that space is provided directly above the system installation for ventilation.

Length:  
21.192 inches  
538 mm

Width:  
19 inches  
483 mm

Height:  
5.22 inches  
133 mm

Weight:  
20 lbs  
9 kg



## 4.0 Installation

### 4.1 System Overview

The Sounder 1602 is a “black box” Echosounder that interfaces to any Windows-based PC to allow the user to control all system parameters, manage peripherals, record entire echogram data, as well as internal and external data logging. The communications link from the Sounder 1602 to the PC is via USB (full speed 2.0). A USB Communications Cable (D219-05424) is provided with the shipment.

### 4.2 Software Installation

A CD-ROM is provided with the system which installs the software necessary to control the Echosounder as well as other support utilities, hardware drivers, and documentation files. The CD-ROM should auto-run but if it does not simply run the SounderSuite.exe file located on the disk. This will initiate the SounderSuite-USB installation wizard which will guide the user through the rest of the software installation process.

### 4.3 Connector Panel Overview

#### 4.3.1 Input Power

The Sounder 1602 Echosounder needs to be powered from a DC source; the input voltage range is 12-30VDC (nominal 24VDC). A DC power cable (D219-02250) is provided with the shipment to allow connection to any suitable DC supply. An optional VAC to VDC converter is also available upon request.

The power consumption of the Sounder 1602 is detailed below:

Start (impulse): 40W

Quiescent (powered on, not pinging): 12W

Operating (min power, shortest pulse length): 14W

Operating (max power, longest pulse length): 24W

#### 4.3.2 Transducer Connections

The CH1 and CH2 Transducer connections are used for interface to the matching transducers. Both channels feature three pin MIL style connectors that handle the high voltage outgoing transmit as well as the low voltage incoming receive. Pinouts for the specific transducer connections are found later in this manual.

#### 4.3.3 USB Interface

As mentioned in the System Overview, the USB interface provides communications from the Sounder 1602 to the Windows-based host PC. It is a full speed 2.0 (12Mbps) connection. It is a MIL style connection matched to the provided D219-05424 USB cable but will mate with a standard “B” type USB cable in needed.

#### 4.3.4 Analog Output

The Analog Output BNC provides a 5V analog signal referenced to circuit / chassis ground. This is the received signal from the transducer after pre-amplifications, analog gain, and anti-alias bandpass filtering, immediately prior to digitization. It is provided for diagnostic use during maintenance and service only.

#### 4.3.5 Sync In / Out

The Sync In BNC connection can be used to sync the Sounder 1602 outgoing pulse with another device. Under the System Menu of the EchoControl Client the user will find an option to change the Sync Mode from Internal to External. Once set to External the system will look for a high-to-low-to-high transition with a low cycle hold time of at least 1ms but less than 50ms (min ping rate) on the Sync In BNC located on the system connector panel. The Echosounder transmit will occur on the rising edge of the sync signal. With the Sync Mode set to Internal the Sync Out BNC provides a similar signal on each ping interval.

#### 4.3.6 Circuit Breaker

For additional system protection there is a circuit breaker located next to the Input Power Connection.

#### 4.3.7 Ground Stud

There is a ground stud provided for connection to the chassis ground of the system. It is located directly above the Input Power Connection.

### 4.4 Front Panel Overview

#### 4.4.1 Power Switch

The Main Power located on the front panel is a covered switch which when locked in the active position will pass the input voltage to the internal modules; the switch illuminates when active. When it is in the deactivated position, power to the internal modules will be terminated.

#### 4.4.2 Serial Number Plate

The Sounder 1602 Part Number and Serial Number are located on the ID plate located below the Power Switch on the front panel. This information may be asked for during support.

### 4.5 System Connection

#### 4.5.1 Peripherals / Data Logging

All peripherals such as GPS and Heave Compensators are connected directly to the host PC and setup is performed via the EchoControl Client software applications.

Same as the peripherals, any connections to an external data logger is done through the PC. There is also the capability to run the data logger package on the same PC as your EchoControl software.

## 5.0 System Operation

Once the software installation process has been completed, the PC should automatically recognize the Sounder 1602 upon power up. The SounderSuite Installation CD will have installed application shortcuts for the main EchoControl software onto the desktop of the PC for easy accessibility. Normally, the EchoControl Client application should be able to auto-run the required EchoControl Server application; when the Server application is started and running a “K” will appear in the task bar. If the EchoControl Client fails to auto-run the Server properly, shut the client down, start the EchoControl Server manually via its icon, then start the EchoControl Client which should now be able to connect to the Server properly.

For a complete explanation on the operation of the EchoControl Server and EchoControl Client please refer to the following software manuals:

*D101-04380 EchoControl Client User Manual (hard copy provided with shipment, soft copy installed on host PC)*

*D101-04381 EchoControl Server User Manual (soft copy installed on PC)*

### 5.1 Basic Operation

The EchoControl software provides access to numerous controls for system control, peripheral interfaces, data recording, and real time data display. The following section defines the usage of the main system operational controls. For a complete explanation on the operation of the EchoControl Client please refer to the following manual:

*D101-04380 EchoControl Client User Manual (hard copy provided with shipment, soft copy installed on host PC)*

**NOTE:** The following discussion assumes operation will be in shallow water depths of less than 200m. If the water depth is greater than 200m, the high frequency channel will not be able to operate effectively due to the excessive signal attenuation within the water column.

#### 5.1.1 Control Definitions

**TX Power:** controls the amount of power used for the outgoing transmit pulse. There are four settings with incremental steps of approximately 25% of the total maximum power level.

**TX Pulse Length:** controls the duration of the outgoing transmit pulse. The maximum pulse lengths for Sounder systems is 4ms.

**TX Blanking:** controls where the depth digitization algorithm starts to look for a return echo. This should be set deep enough to look past any transducer ringing that may be misidentified as a return echo and improperly tracked as the bottom.

**Analog Gain:** controls the analog gain of the receiver circuitry.

**Digital Gain:** scale factor applied during the digital signal processing.

**AGC:** automatic gain control – an algorithm that adjusts the analog gain on a ping-by-ping basis based on previous data.

**TVG:** time varied gain – curves that adjust the analog gain in use during single ping acquisition cycle.



*Range:* determines the size of the active window.

*Phase:* determines the location of the search window in the water column.

*Min / Max Depth:* determines the upper and lower depth limits when using Auto Phase mode.

### 5.1.2 Depth Detection

To get the channel to acquire the bottom, the minimum TX Power and Pulse Length needed to determine a bottom should be used. In shallow water, lower power and shorter pulse lengths are typically adequate to get a reasonable bottom return. As the depth increases, the power and pulse length should be increased as needed to maintain the return echo.

AGC is recommended for this channel, used in combination with the Processing Shift for the best results. If the AGC algorithm is having to adjust the gain level to values above 40db, the Processing Shift should be increased until the analog gain level is reduced. This is to prevent over driving of the analog filter and saturation of the receive signal.

TX Blanking should be set deep enough for the digitization algorithm to see past the transmit pulse and any transducer ringing that may be present. The duration of the pulse and any ringing present should be clear from the echogram chart and the Tx Blanking can be adjusted accordingly.

## 6.0 Basic Troubleshooting

### 6.1 Power Indicator Off

If the power switch does not illuminate when locked in the active position first confirm the proper input voltage is provided. If the input voltage is verified then connect to PC to confirm possible operation. It may be that the bulb in the switch has become dislodged or has failed. If the problem continues please contact Knudsen Support.

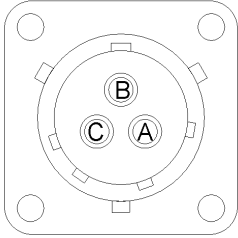
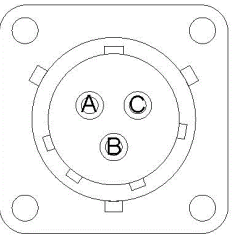
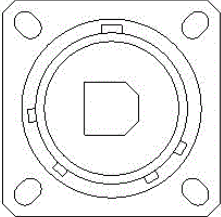
### 6.2 No Communications to PC

If the EchoControl Server does not automatically connect to the Sounder 1602 first confirm proper system power on. Next try to connect the USB Communication Cable to other available USB ports on the host PC. At this point change the USB cable. If the problem continues please contact Knudsen Support.

### 6.3 No Output to Transducer(s)

Confirm that the transducer you are wishing to operate is connected to the corresponding channel. Next, with the Echosounder output OFF check the transducer cable and the cable end connector for any possible bends, breaks, or visual damage.

## 7.0 Cable Connections

<p><b>INPUT POWER</b></p> <p>Part Number: MS3470L12-3PY  Mating Connector: MS3476L12-3SY (or equivalent)  Preferred Cable: DSS-2  A – DC +  B – No Connect  C – DC -</p>	
<p><b>CH1 and CH2 TRANSDUCER</b></p> <p>Part Number: MS3470L12-3S  Mating Connector: MS3476L12-3P (or equivalent)  Preferred Cable: DSS-2  A – HIGH  B – SHIELD  C - LOW</p>	
<p><b>USB Interface</b></p> <p>Part Number: USBBFTV22N  Mating Cable: D219-05424</p>	
<p><b>ANALOG OUT / SYNC OUT / SYNC IN</b></p> <p>Part Number: 31-10  Mating Connector: any standard BNC connection  Center Pin: Signal  Shell: Ground</p>	