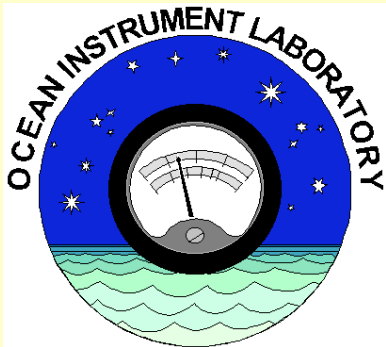


**Reach Out and (re)Boot Something
Inexpensive Serial to Ethernet Converter
A/D Over Ethernet for \$15/channel**

UNOLS RVTEC Annual Meeting
Moss Landing Marine Labs • 7 November 2007

Thomas C. Wilson, Jr.

Ocean Instrument Laboratory
School of Marine and Atmospheric Sciences
Stony Brook University • Stony Brook NY 11794 USA
thomas.wilson@stonybrook.edu



SoMAS

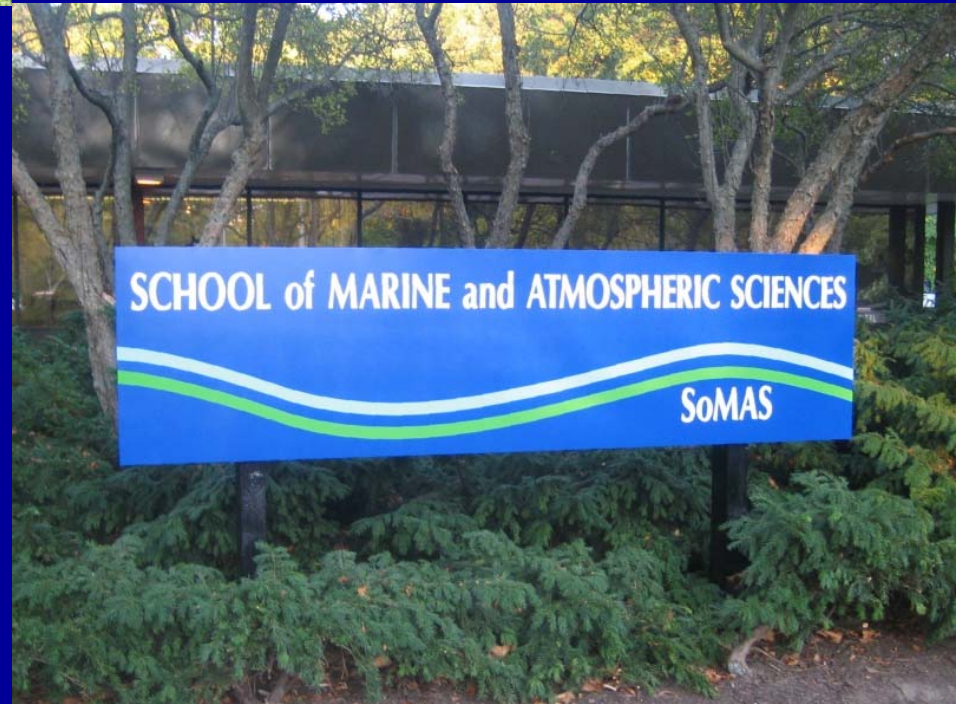




Point of Information

As a consequence of growth and expansion since establishment in 1965...

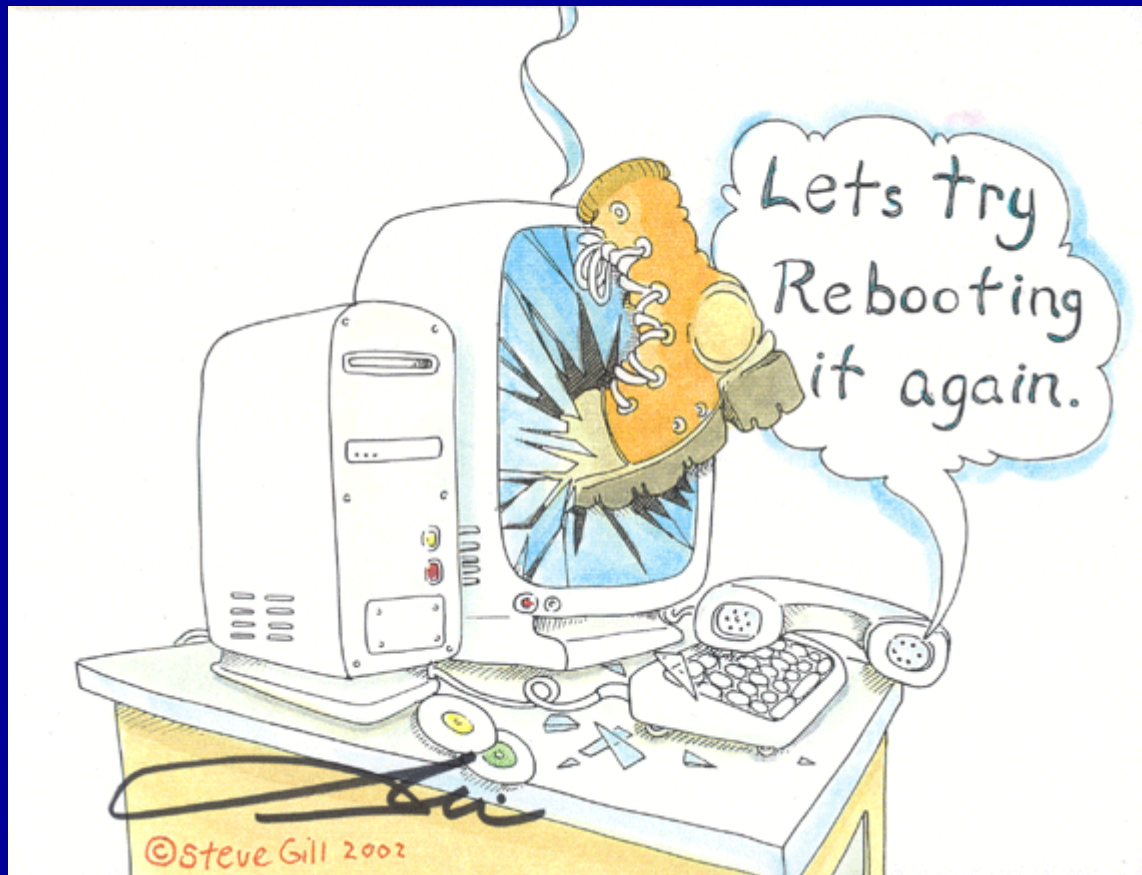
the Marine Sciences Research Center has evolved into the School of Marine and Atmospheric Sciences



Usual Disclaimers Apply

1. Unless specifically noted, author has no commercial interest in any product or service mentioned.
2. This is the stuff we have used successfully, if you know of better / cheaper / faster please let everyone know.
3. “Economical” means as of November 2007. We all know a bargain today is usually ho-hum tomorrow.
4. Your mileage may vary.

Chapter 1: Reach Out and (re)Boot Something

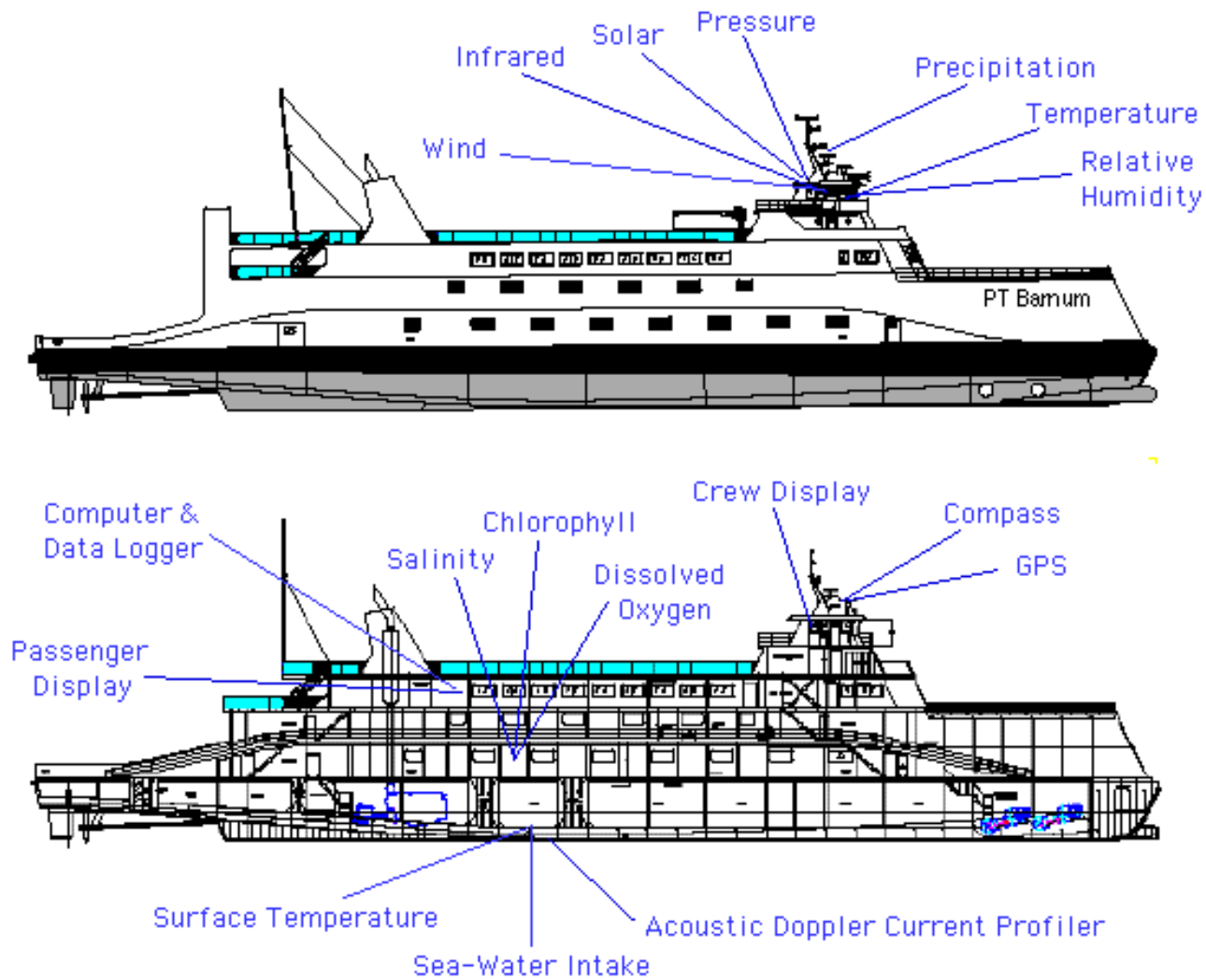


If you haven't done it, you've thought about it...

Since 2001, the Ocean Instrument Laboratory has operated the SoundScience autonomous data system aboard the *P.T. Barnum*, a 300-foot passenger ferry crossing Long Island Sound between Port Jefferson NY and Bridgeport CT.



The *Barnum* system consists of fifteen instruments measuring about 30 parameters, a central data acquisition computer, two display computers, and a wireless Internet link to shore.



Even when following best practices for power/UPS surge protection, and software - many service calls required no more than a power cycle of the affected subsystem.

Multitasking: Triennial drydock in New London CT same week as RVTEC / Inmartech 2006 in Woods Hole MA



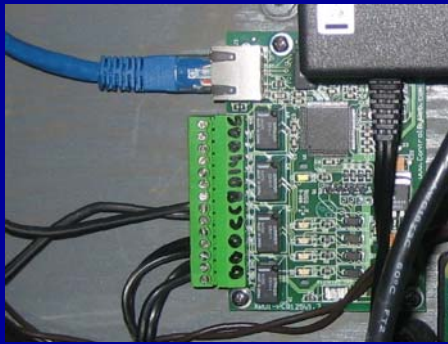
Hardware Installed



iBoot

1. iBoot Power Control.

- Data acquisition computer & main data switch.

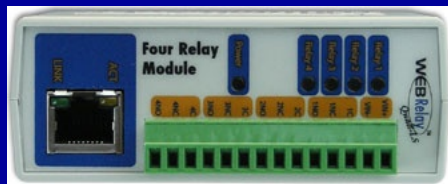


Webrelay Quad

bare board above no longer sold
have to buy cased model below

2. Webrelay Quad: Generator Room.

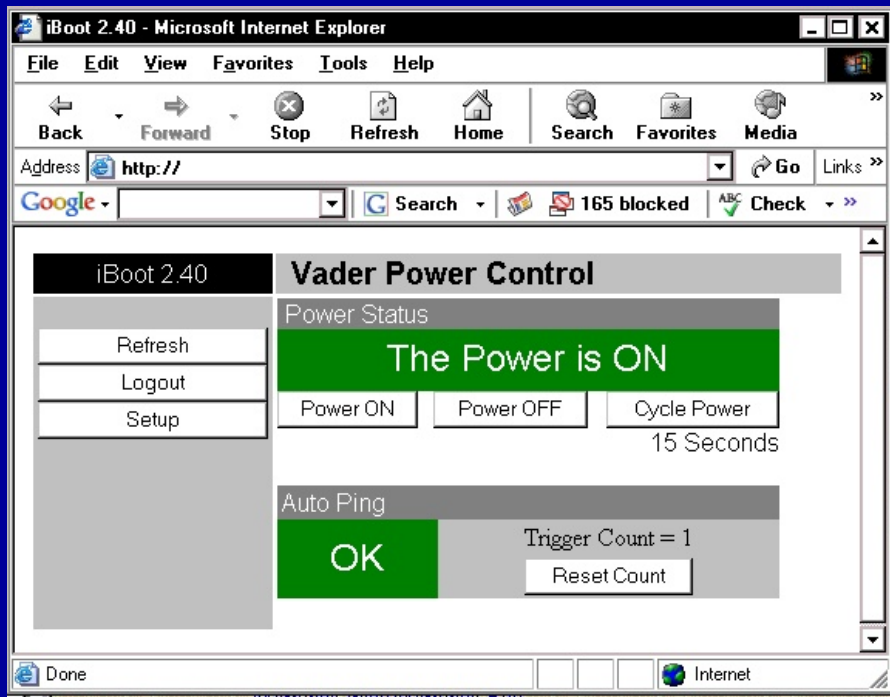
- 12 volt instruments: GPS, compass, met sensors, multiplexer.
- Wireless Internet Router.
- Router watchdog.



3. Webrelay Quad: Hydro Deck.

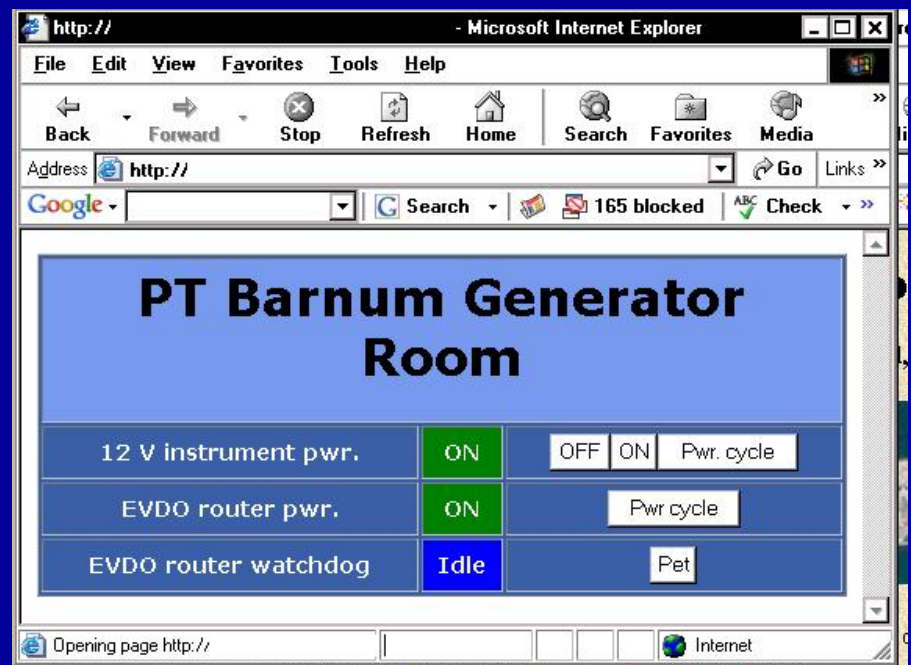
- 12 volt instruments: salinometer, SST, fluorometer, multiplexer.

Software Installed



All three switch systems can be monitored / commanded from shore from any browser using Dynamic DNS and unique high port numbers that are redirected to port 80 (http) of appropriate intranet address by router port forwarding.

Data acquisition computer pings iBoot and wireless Internet router watchdog. Failure of switch or computer results in switch & computer power cycle. Failure of router results in router power cycle.



Results

Addition of remote power controls have resulted in:

1. A marked decrease in the number of on-site service calls to the ship.
2. Quicker problem resolution, particularly on nights, weekends, and holidays.
3. Happier scientists, engineers and techs get more sleep.

Chapter 2: Inexpensive Ethernet to Serial



SENA serial servers, marketed in USA by Axxeon Technologies.

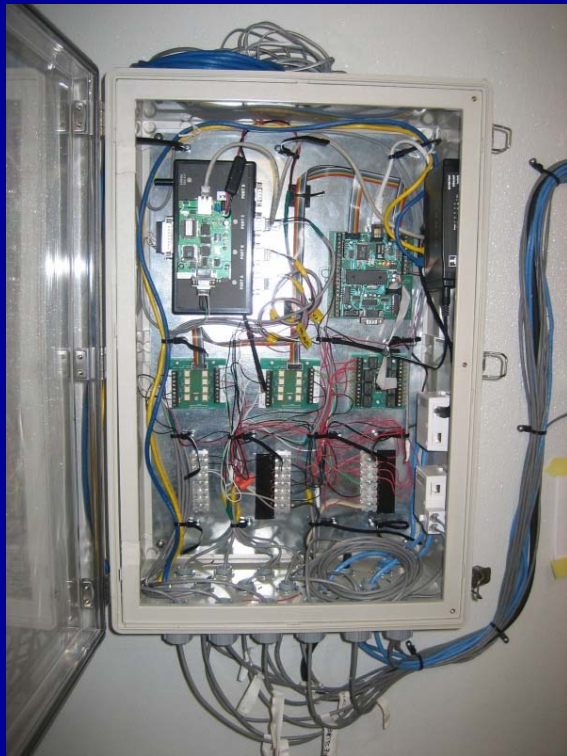
- Single RS232 port (multiple ports and RS422 available)
- LS100 is cased with external power supply
- LS100B is bare board, no PS.
- LS110 supports RFC2217, Telnet remote COM port protocol (allows remote control of com port parameters and control/monitoring of status lines).

Software options

1. Your favorite Telnet client.
2. Many programming languages allow you to manage an IP connection just like a local COM port, i.e. open, close, read, write, etc.
3. SENA provides a free COM port redirector that creates virtual COM ports on your Windows machine. This allows most Windows legacy software to work without modification presuming they are forgiving of some additional delay and latency.
4. There is also a Linux TTYRedirector that functions similarly to the Windows COM port redirector.

Example Application

Bluepoints Seawater Lab - West Sayville NY



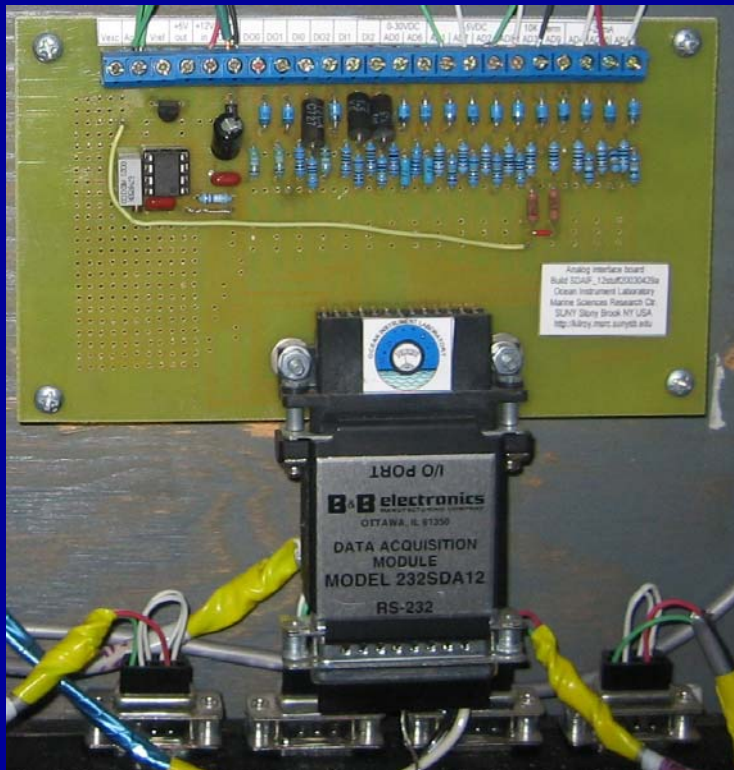
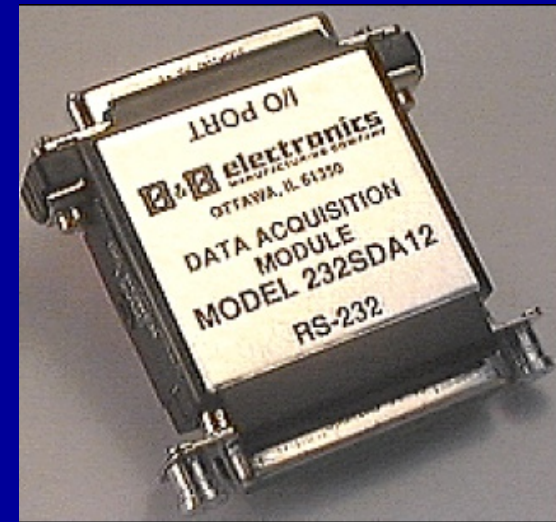
Serial multiplexer
combines three
RS232 output
temperature
sensors, LS100B
converts output to
Ethernet.



Chapter 3: A/D to Ethernet for \$15/channel

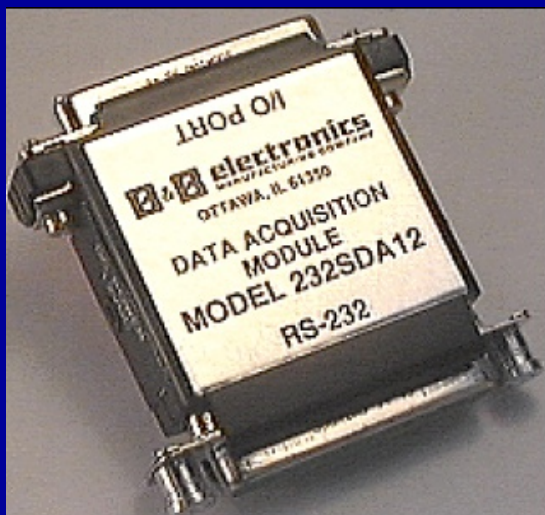
B&B Electronics 232SDA12

- 11 channels of 12-bit A/D
- 3 digital inputs, 3 digital outputs.
- Simple ASCII commands over RS232.



Easy to augment base capability. Board at left is mounted on P.T. Barnum. It provides precision A/D reference, reverse polarity & spike protection, 0-5VDC, 0-30VDC, 4-20mA, and 10K thermistor inputs.

Budget: A/D to Ethernet for \$15/channel



232SDA12: \$64.95

LS100B: \$69.00

=====

\$133.95

÷11

=====

\$12.17 per channel



Leaving a budget surplus of \$31.05 for connectors, cables, power supply, etc.

Approximate 90.4% cost reduction from \$2,500 16-channel A/D to Ethernet converter presented at an RVTEC Show and Tell some years ago.

“Ain’t progress GRAND!”

Base Prices - November 2007

WebRelay Quad: \$114.00

WebSwitch (2 outlets): \$196.00

iBoot (1 outlet): \$275.00

iBootBar (8 outlets): \$475.00

232SDA12 Serial A/D: \$64.95

LS100B Ethernet to Serial: \$69.00

SENA Com port redirector: free!

Hoping these gadgets allow you to redirect resources to address more important issues...



**...like
who
gets
the
top
bunk.**

Resources

WebSwitch / WebRelay: www.controlbyweb.com

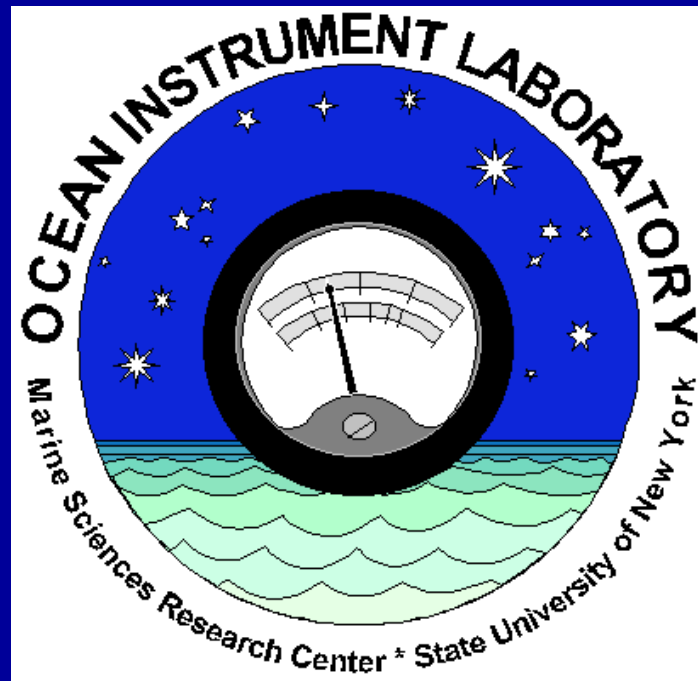
iBoot / BootBar: www.dataprobe.com

LS100 / LS100B Serial to Ethernet: www.aaxeon.com

Com port redirector: www.sena.com/support/downloads/

232SDA12: www.bb-elec.com

Thank you!



thomas.wilson@stonybrook.edu