Virtual Integrated Data System

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Design Goals

- Network Based
  - Convert all sensor inputs to network connection
- Modular Hardware
  - No internal A/D computer cards
- Modular Software
  - Ease of Maintenance
  - No guru needed
  - New modules don’t compromise existing modules, each sensor is logged to it’s own file.
- OS Independent

Components of VIDS

Sensors

Interface - Transport

Collection Software

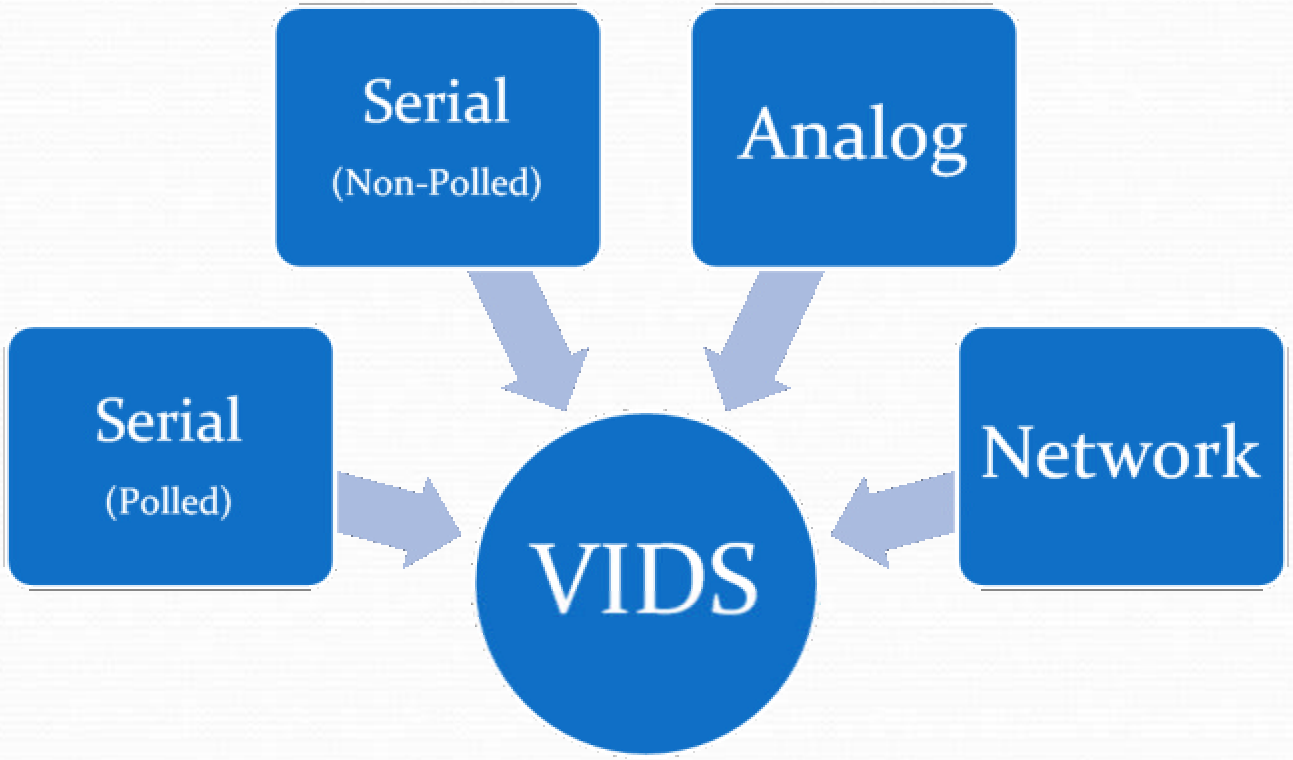
Storage - Redundancy

Display

QuIC

Metadata

Sensor Types



Sensors, Serial (Non-Polled)

- POS/MV 320
- GPS x2
- Wind Speed & Direction x2
- Barometer x2
- Air Temperature x2
- Relative Humidity x2
- Depth Sounder
- Winch Parameters
- Science Gyro
- Plankton Counter

- Bridge Equipment

  (Single Feed)

  - Depth Sounder
  - GPS x2
  - Gyro
  - Speed

Sensors, Serial (Polled)

- Rain gauge
- Sea Surface Salinity x2
- Sea Surface Temperature (x2)

Sensors, Analog

- Solar radiation
  - PIR
  - PSP
  - TUVR
  - PAR
- Fluorometer
  - Chlorophyll
  - Dissolved Organic Matter
  - Digital Inputs to control range

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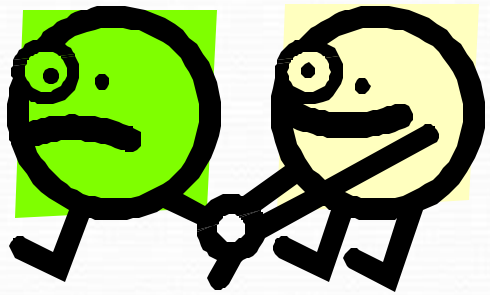


Sensors, Analog (continued)

- Transducer Sensors
  - 3.5 kHz array air isolation pressure
  - Head tank levels
- Pumping Sensors
  - Pump Temperature 2x
  - Head Pressure
  - Pre Post strainer pressure (vacuum)
  - Flow – lots
  - Leak Sensor
- Pumping Controls
  - Pump Select & Energize
  - Strainer Select

Sensors, Network

- POS/MV 320 (developmental)
- ADCP (developmental)
- Room Relative Humidity & Temperature

Components of VIDS


Sensors


Interface - Transport

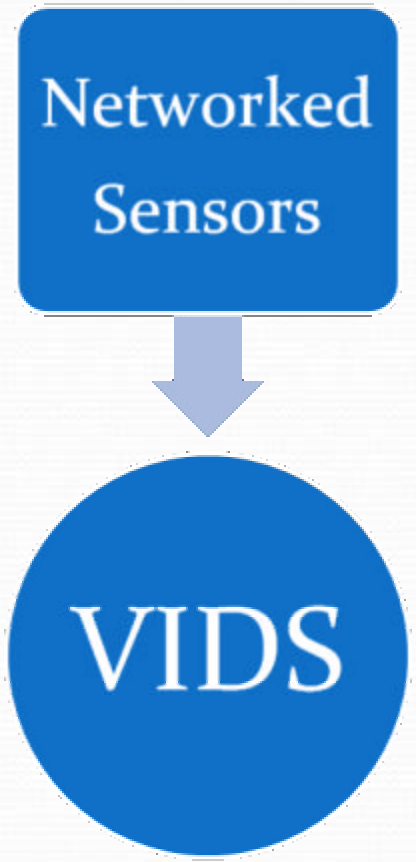

Collection Software


Storage - Redundancy


Display

QuIC Metadata

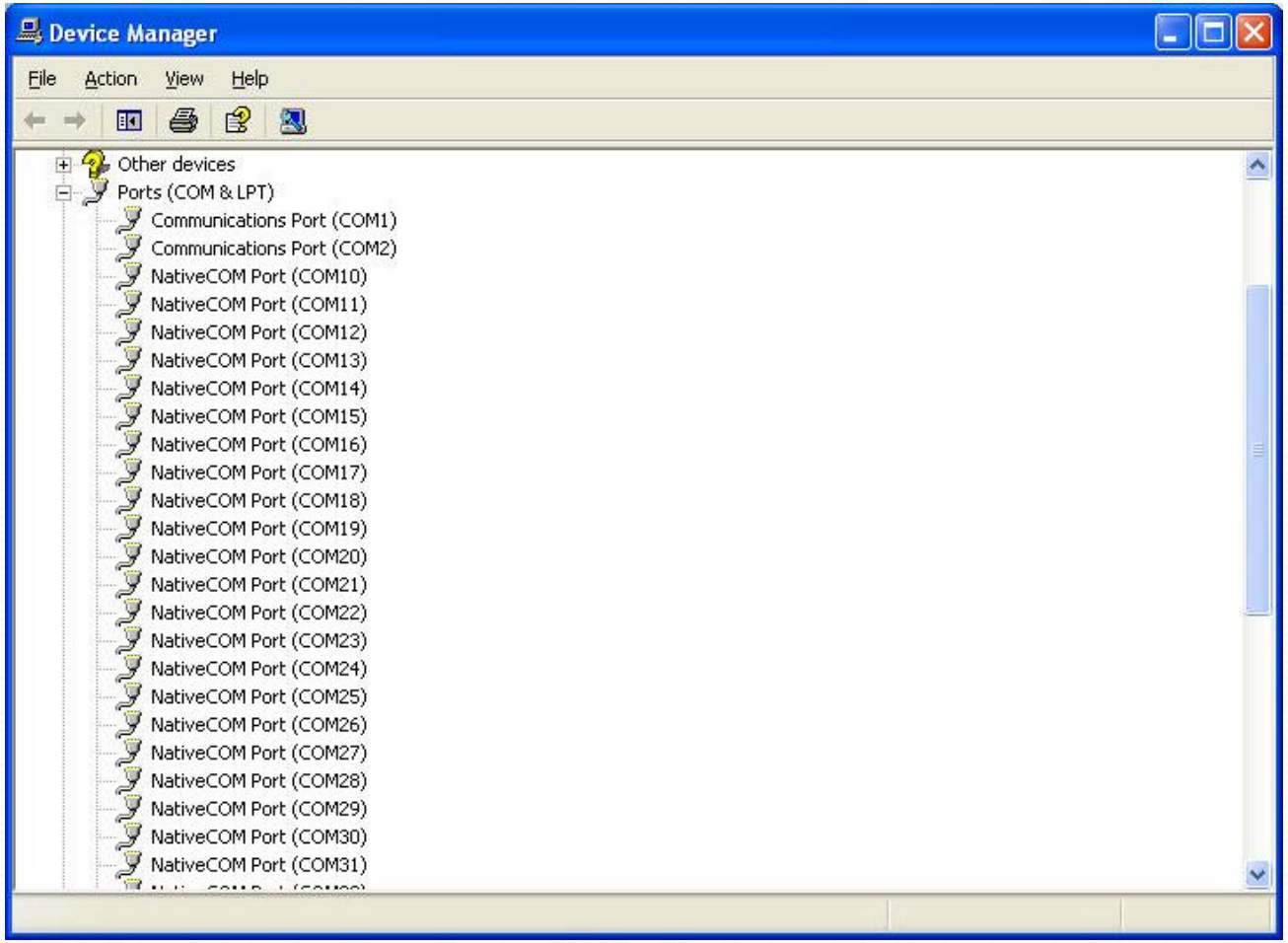
Interface - Transport



Interface – Transport, Serial

- Port Servers
  - **Converts Serial Devices to Network Devices**
  - Systech, Digi, Others
  - Taltec TCP/Com, makes any serial device available to any computer through serial port mapping
  - Provides electrical isolation
  - Reduces interrupts

Port Server


Device Manager
File
Action
View
Help
Other devices
Ports (COM & LPT)
Communications Port (COM1)
Communications Port (COM2)
NativeCOM Port (COM10)
NativeCOM Port (COM11)
NativeCOM Port (COM12)
NativeCOM Port (COM13)
NativeCOM Port (COM14)
NativeCOM Port (COM15)
NativeCOM Port (COM16)
NativeCOM Port (COM17)
NativeCOM Port (COM18)
NativeCOM Port (COM19)
NativeCOM Port (COM20)
NativeCOM Port (COM21)
NativeCOM Port (COM22)
NativeCOM Port (COM23)
NativeCOM Port (COM24)
NativeCOM Port (COM25)
NativeCOM Port (COM26)
NativeCOM Port (COM27)
NativeCOM Port (COM28)
NativeCOM Port (COM29)
NativeCOM Port (COM30)
NativeCOM Port (COM31)

Interface – Transport, Analog

- **National Instruments, FieldPoint**
  - **Converts Analog sensors to Network Devices**
  - Modular Distributed I/O
  - Easy installation and maintenance
  - Hot-swappable and auto-configurable
  - Up to -40 to 70 °C operating range
  - Programmable power-up states
  - 2, 8, and 16-channel modules
  - Ethernet and wireless options

Components of VIDS


Sensors


Interface - Transport


Collection Software


Storage - Redundancy


Display

QuIC Metadata

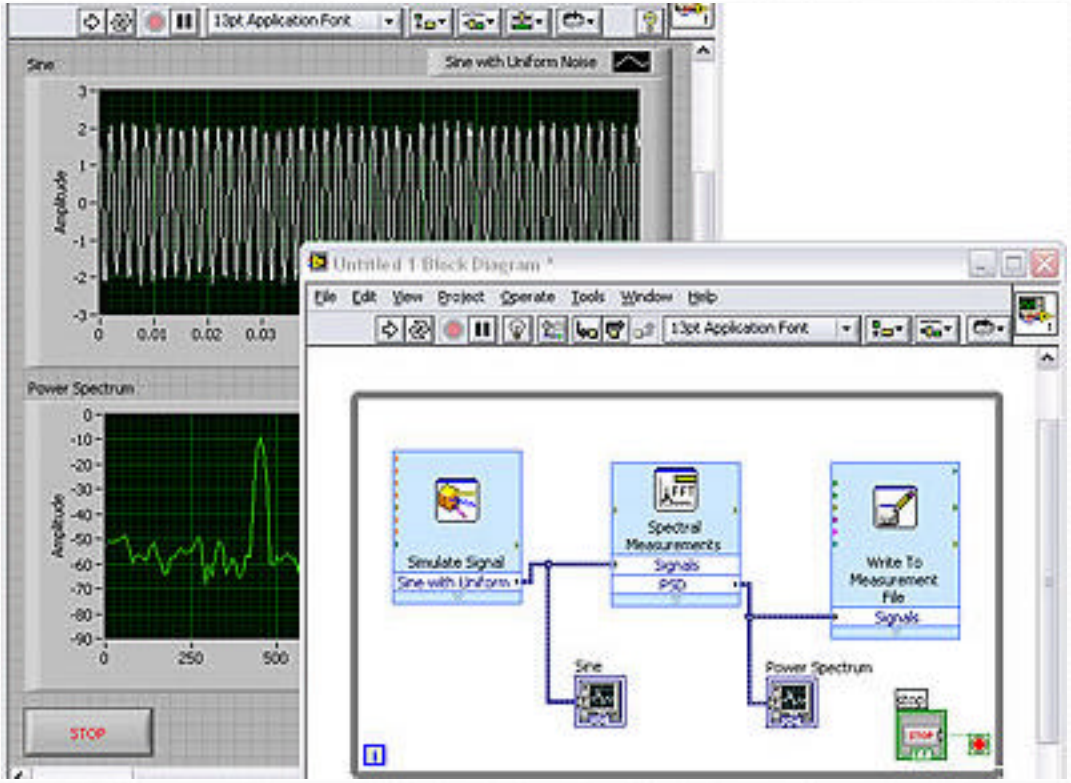
National Instruments LabView

- Platform Independent
- Object Oriented GUI interface
- Drag and Drop Programming
- Factory Training available
- One week training course allows personnel to modify existing modules to meet new requirements
- Initial modules, which are called Virtual Instruments (VIs)

National Instruments LabView

- LabVIEW features
  - Simple GUI creation
  - I/O libraries
    - Serial
    - TCP/IP
    - DataSocket
    - DAQ

Labview Programming Environment



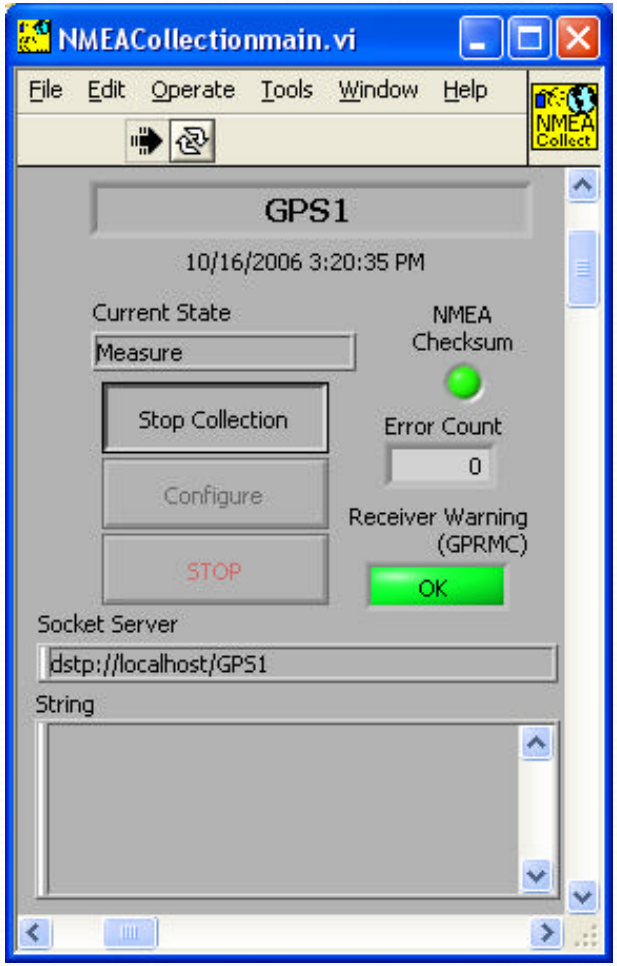
National Instruments LabView

- Virtual Instrument (VI)
  - analogous to procedure or subroutine
  - two parts make up a VI
    - Front panel
    - Block diagram

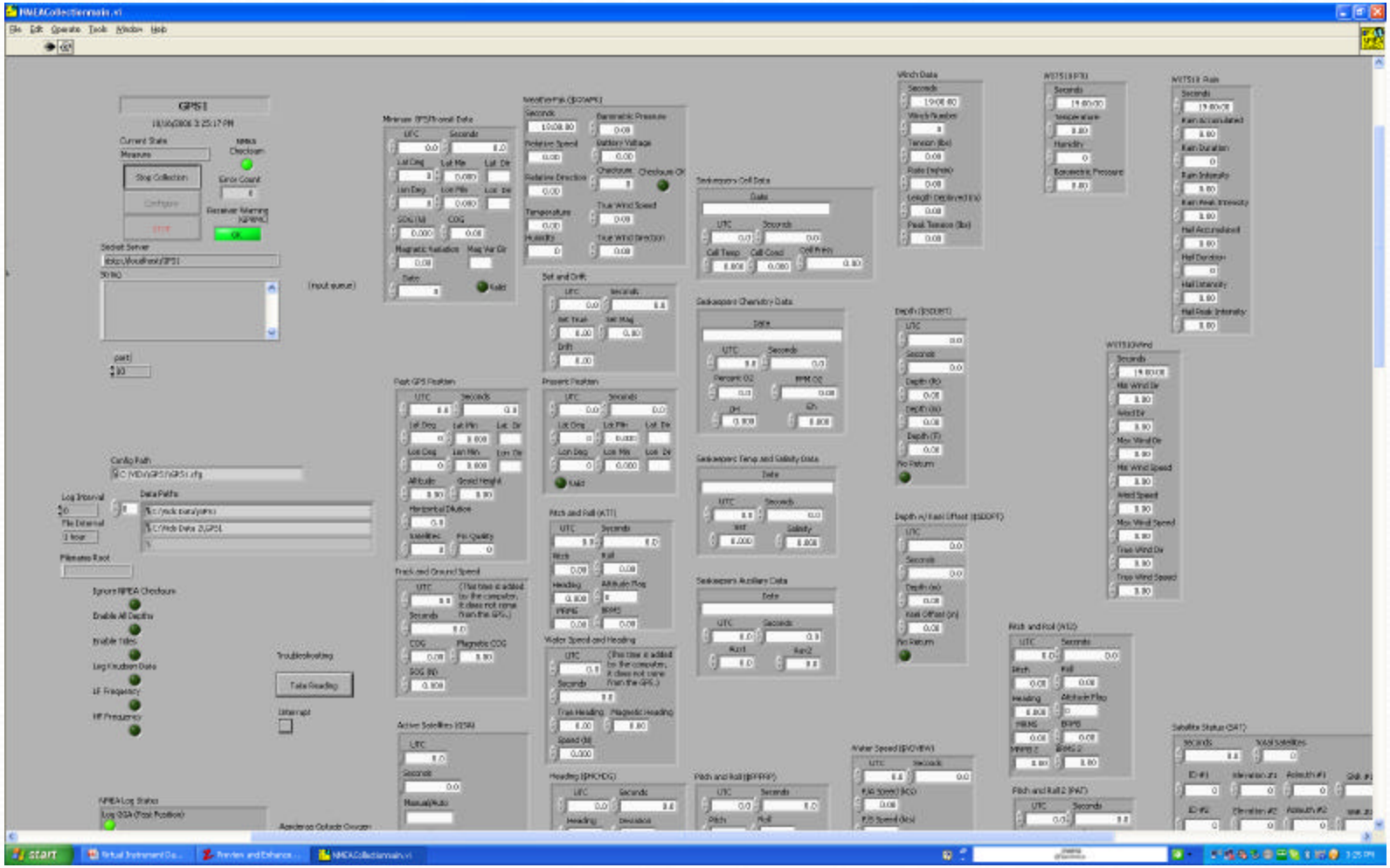
National Instruments LabView

- Data Sockets
  - Used to pass data between VIs programmatically
  - Layer on top of TCP/IP
  - Simplifies data transfer
  - Server orchestrates transfers

NMEA VI Front Panel

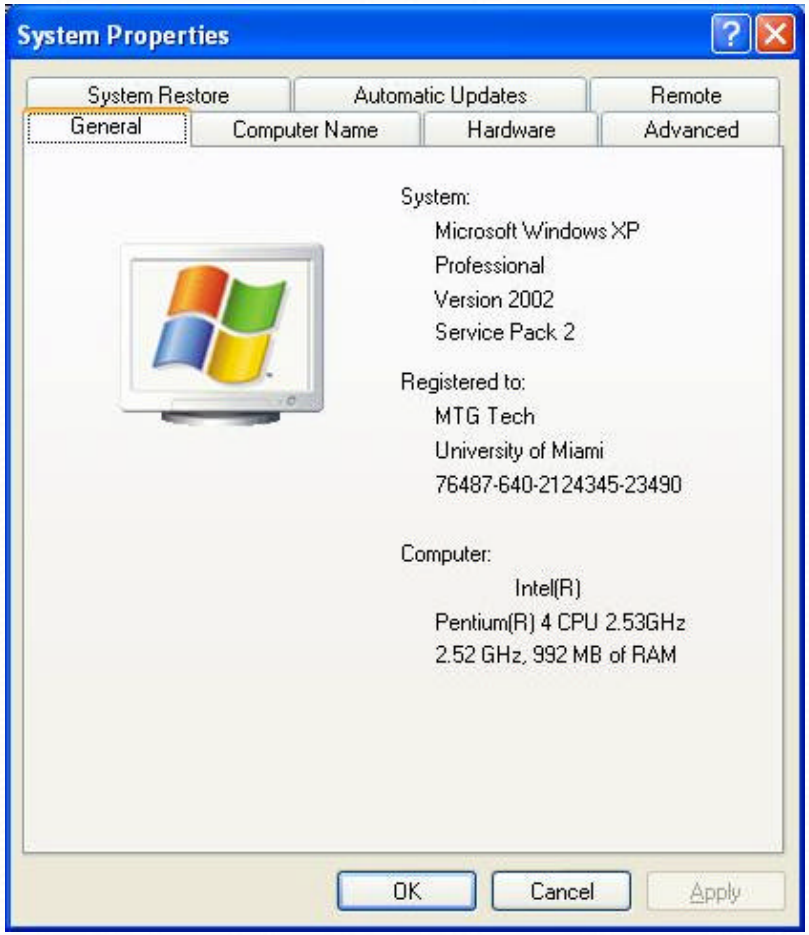


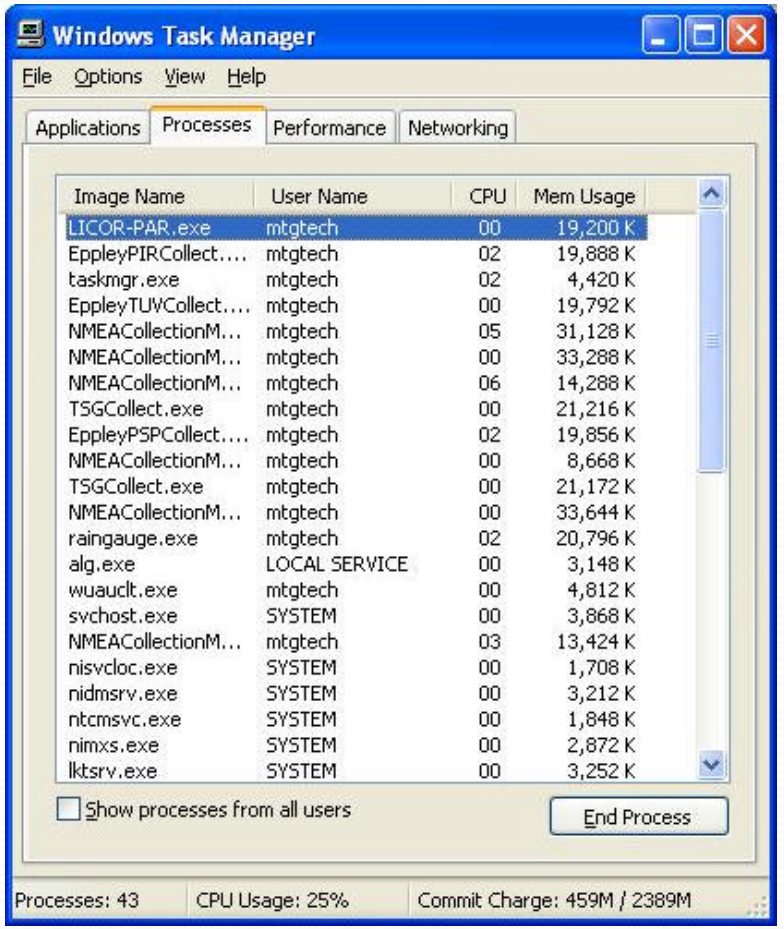
NMEA VI Front Panel (expanded)



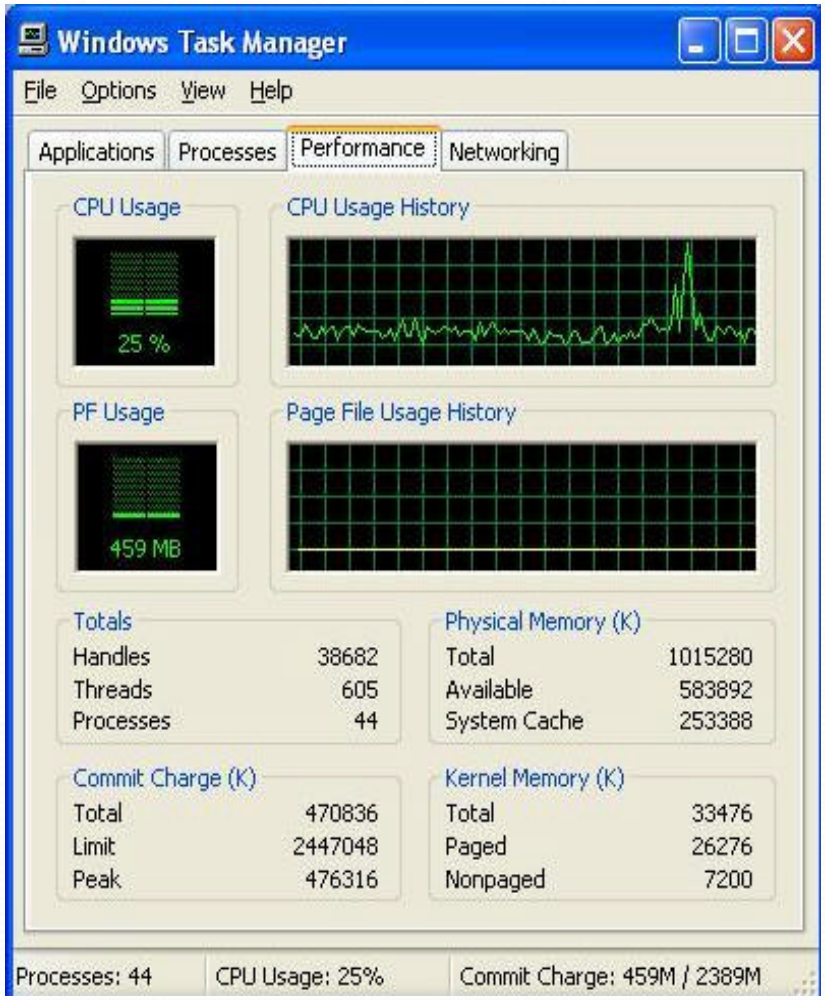

LICOR PAR CollectionMain.vi
LI-COR_PAR
TSCollectionMain.vi
MicroTSG1
RainGageCollectionMain.vi
RainGauge
Generic CollectionMain.vi
EppleyPIR
NMEACollectionmain.vi
GPS1
TSCollectionMain.vi
MicroTSG2
FluorometerCollectionMain.vi
FP Fluorometer
NMEACollectionmain.vi
BowRMYoung
NMEACollectionmain.vi
GyroCompass
NMEACollectionmain.vi
STBDRMYoung
NMEACollectionmain.vi
Bridge NMEA
Generic CollectionMain.vi
EppleyTUV
NMEACollectionmain.vi
POSMV
TSCollectionMain.vi
SBTemp
NMEACollectionmain.vi
RMYoung
Generic CollectionMain.vi
EppleyPSP
NMEACollectionmain.vi
GPS3
Stop Collection
Configure
Measure
Current State
Error
Click here to begin
start

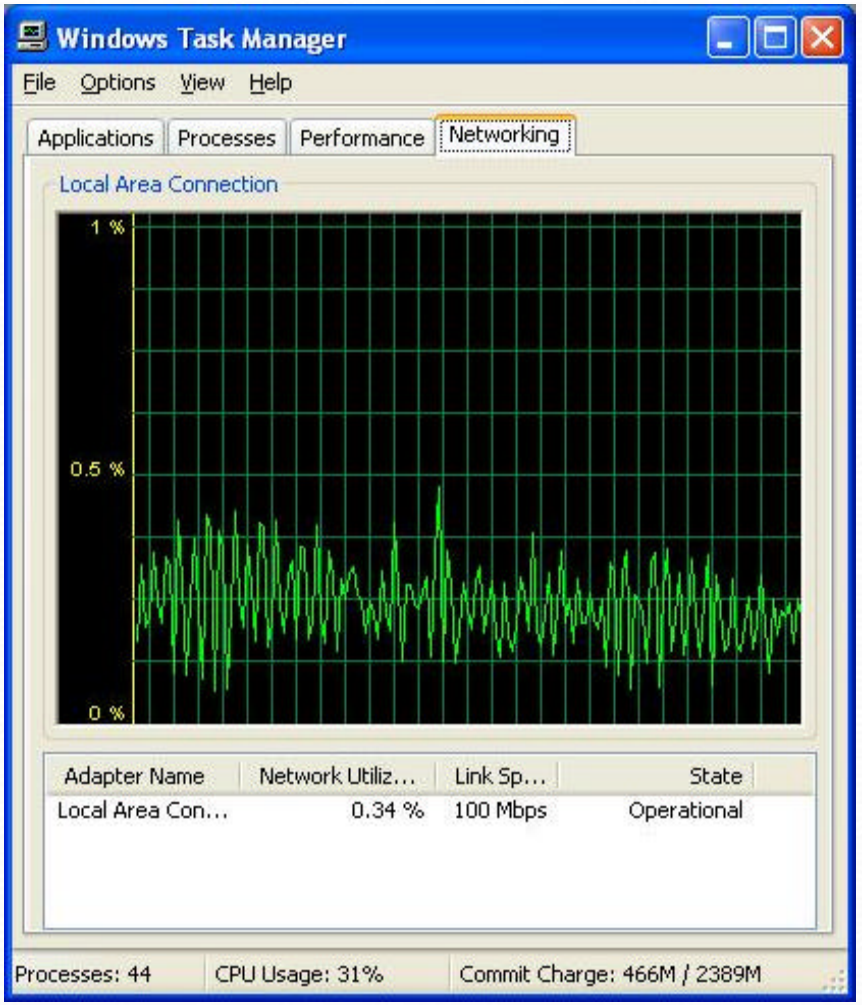
Resource Usage





Resource Usage (continued)





Components of VIDS


Sensors


Interface - Transport

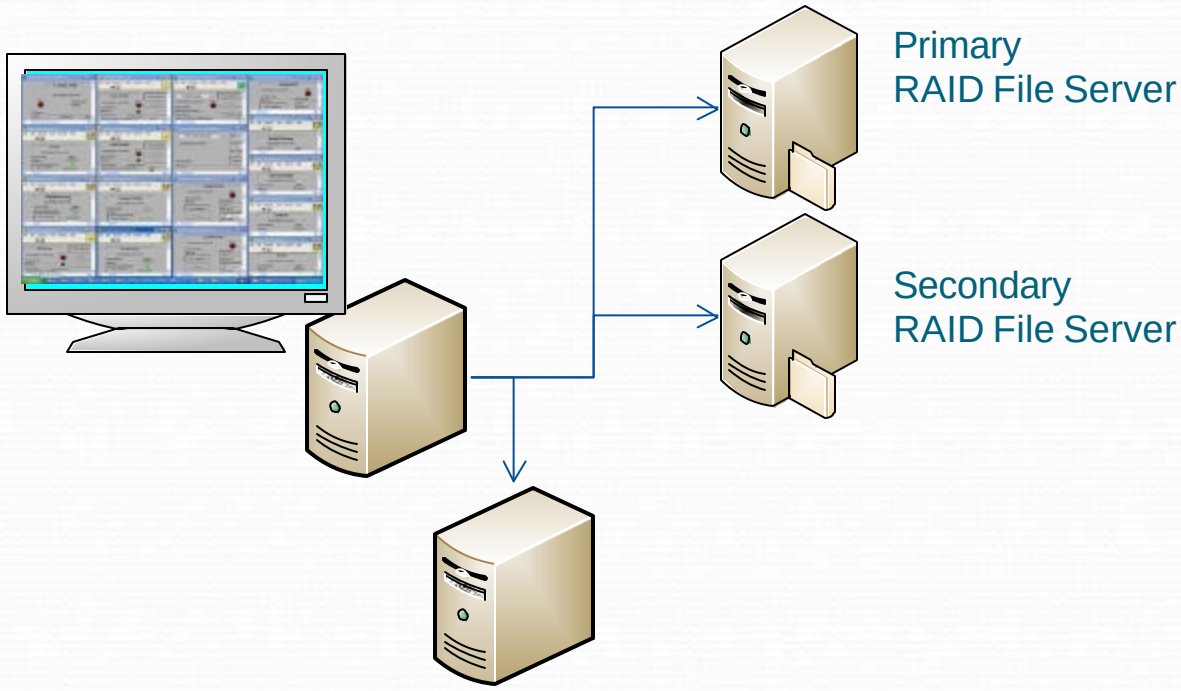

Collection Software


Storage - Redundancy

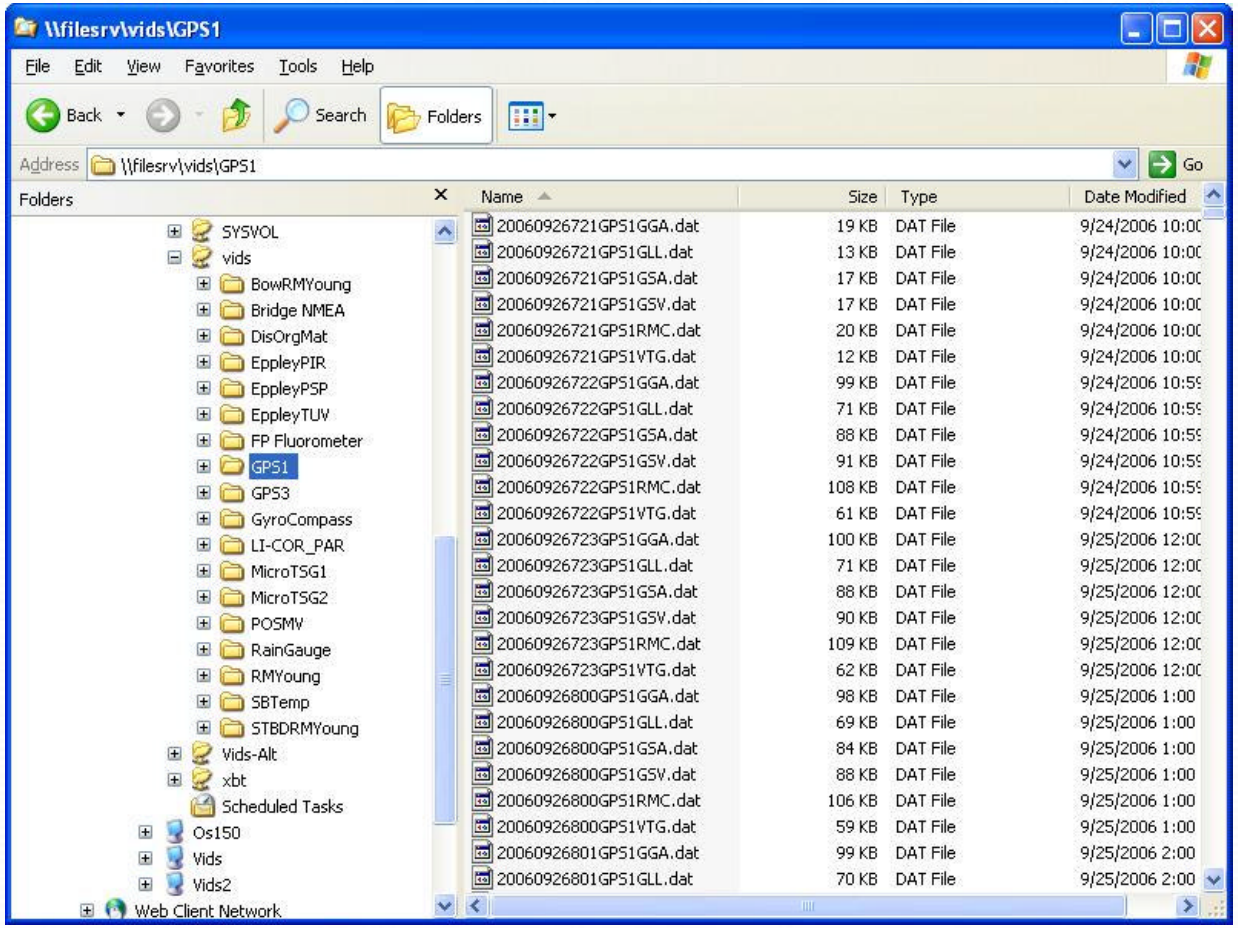

Display

QuIC Metadata

Data Storage



Data File Structure



Components of VIDS


Sensors


Interface - Transport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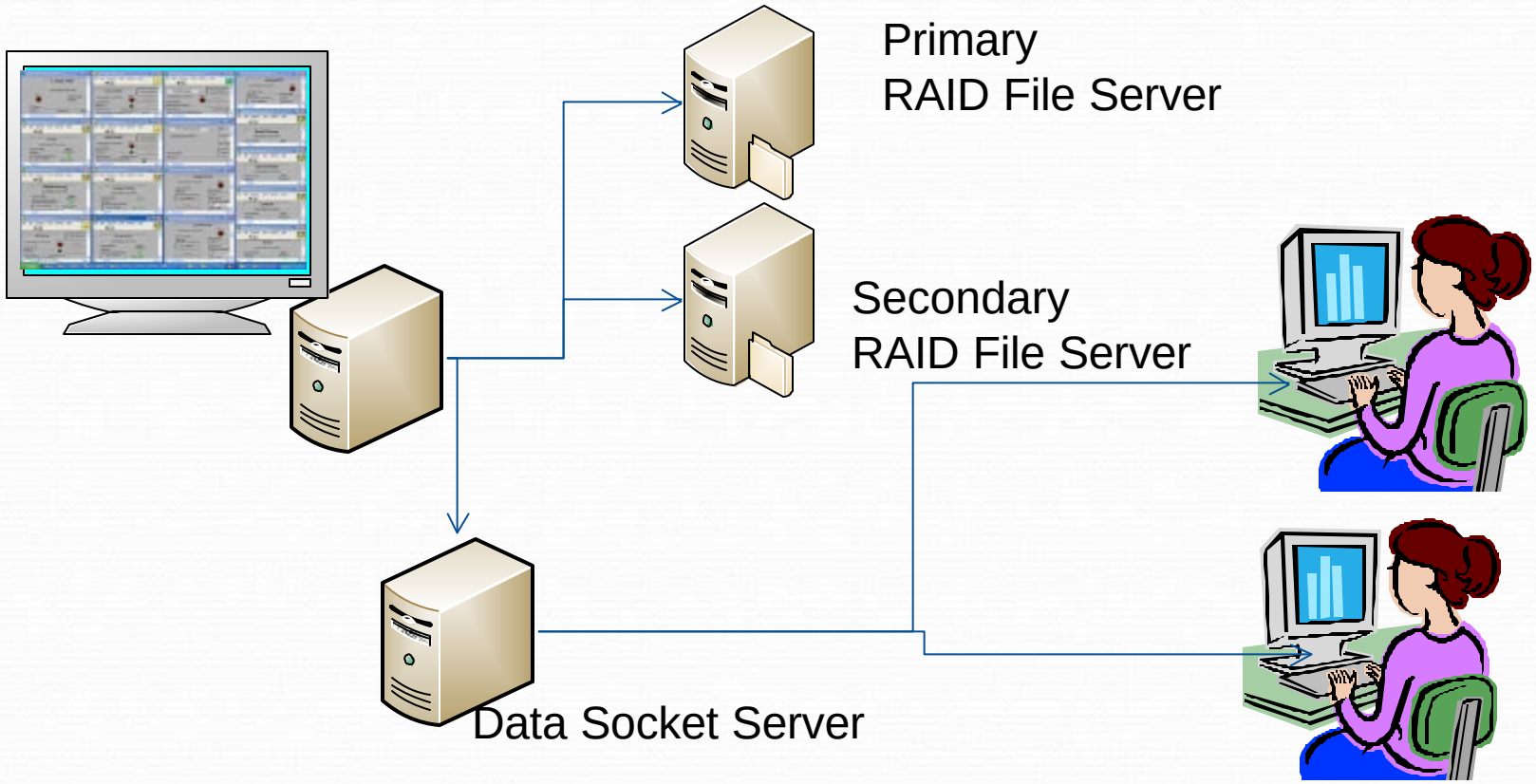
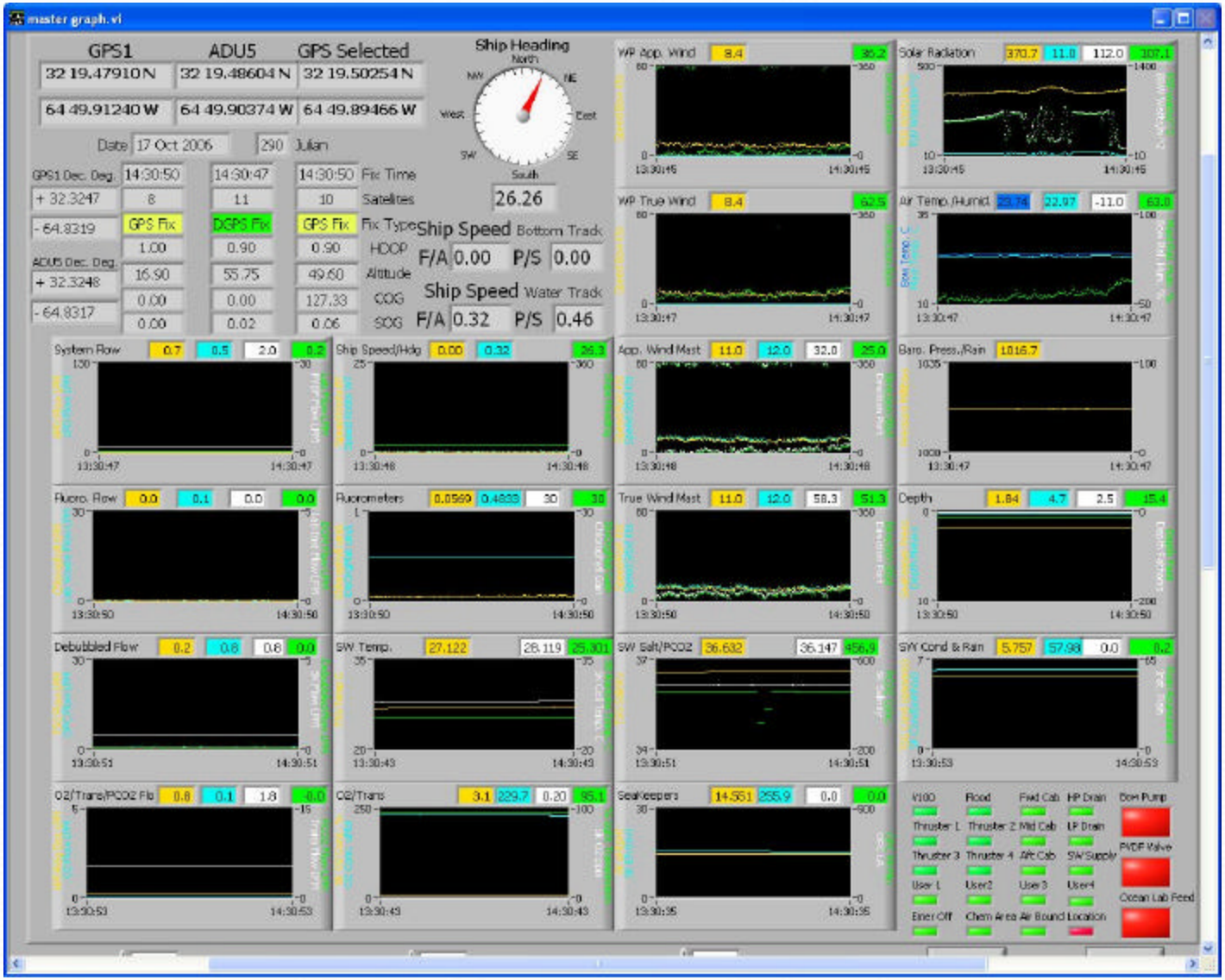
Display

QuIC Metadata

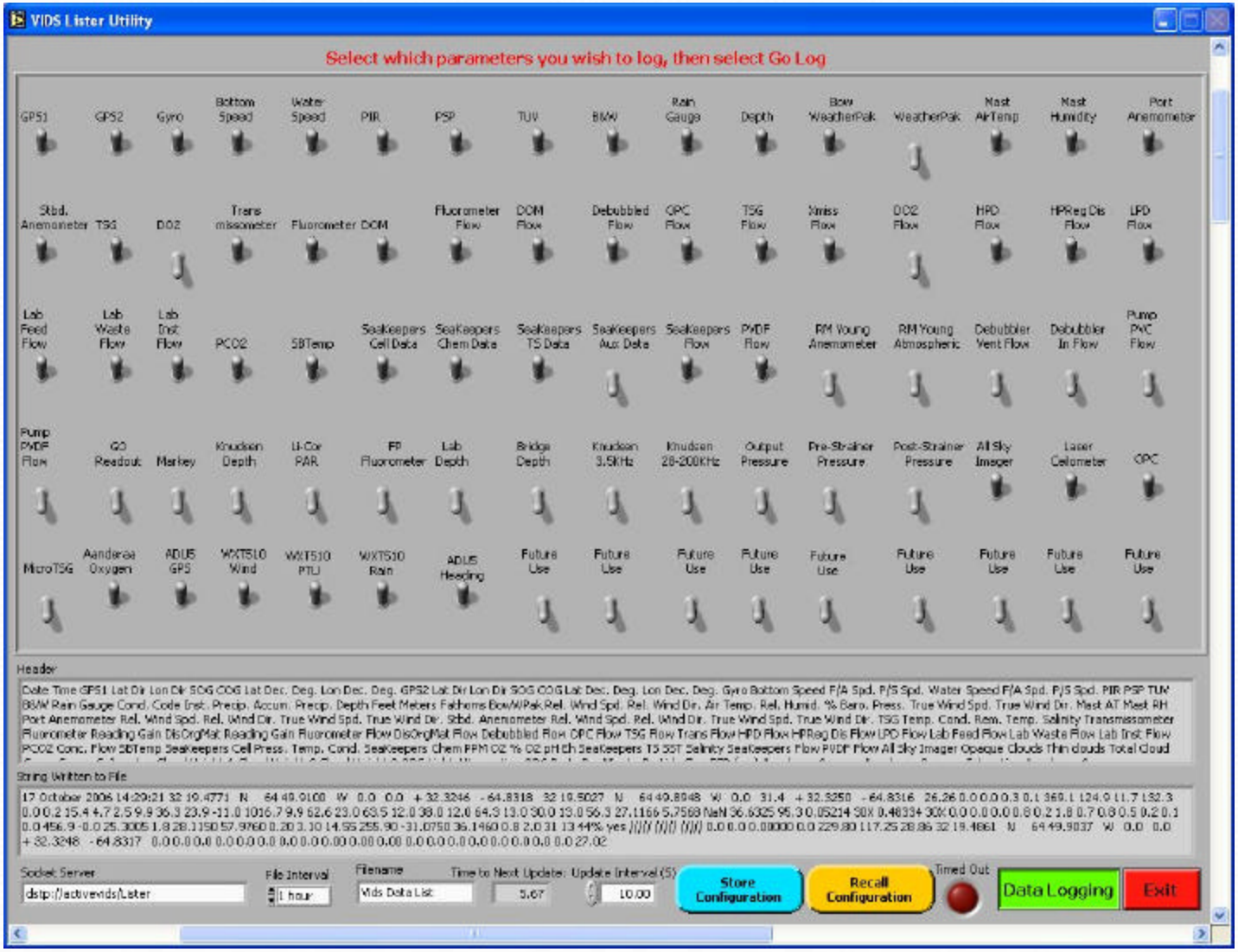
Data Display



Master Grapher



VIDS Lister


VIDS Lister Utility
Select which parameters you wish to log, then select Go Log
GPS1
GPS2
Gyro
Bottom Speed
Water Speed
PIR
PSP
TUV
BMW
Rain Gauge
Depth
Bow WeatherPak
WeatherPak
Mast AirTemp
Mast Humidity
Port Anemometer
Stbd. Anemometer
TSG
DO2
Trans missometer
Fluorometer
DOM
Fluorometer Flow
DOM Flow
Debubbled Flow
OPC Flow
TSG Flow
Xmiss Flow
DO2 Flow
HPD Flow
HPReg Dis Flow
LPD Flow
Lab Feed Flow
Lab Waste Flow
Lab Inst Flow
PCO2
SBTemp
SeaKeepers Cell Data
SeaKeepers Chem Data
SeaKeepers TS Data
SeaKeepers Aux Data
SeaKeepers Flow
PVDF Flow
RM Young Anemometer
RM Young Atmospheric
Debubbler Vent Flow
Debubbler In Flow
Pump PVC Flow
Pump PVDF Flow
GO Readout
Markey
Knudsen Depth
Li-Cor PAR
FP Fluorometer
Lab Depth
Bridge Depth
Knudsen 3.5KHz
Knudsen 28-200KHz
Output Pressure
Pre-Strainer Pressure
Post-Strainer Pressure
All Sky Imager
Laser Celometer
OPC
MicroTSG
Aanderaa Oxygen
ADU5 GPS
WXT510 Wind
WXT510 PTU
WXT510 Rain
ADU5 Heading
Future Use
Header
Date Time GPS1 Lat Dir Lon Dir SOG COG Lat Dec. Deg. Lon Dec. Deg. GPS2 Lat Dir Lon Dir SOG COG Lat Dec. Deg. Lon Dec. Deg. Gyro Bottom Speed F/A Spd. P/S Spd. Water Speed F/A Spd. P/S Spd. PIR PSP TUV BMW Rain Gauge Cond. Code Inst. Precip. Accum. Precip. Depth Feet Meters Fathoms BowWPak Rel. Wind Spd. Rel. Wind Dir. Air Temp. Rel. Humid. % Baro. Press. True Wind Spd. True Wind Dir. Mast AT Mast RH Port Anemometer Rel. Wind Spd. Rel. Wind Dir. True Wind Spd. True Wind Dir. Stbd. Anemometer Rel. Wind Spd. Rel. Wind Dir. True Wind Spd. True Wind Dir. TSG Temp. Cond. Rem. Temp. Salinity Transmissometer Fluorometer Reading Gain DisOrgMat Reading Gain Fluorometer Flow DisOrgMat Flow Debubbled Flow OPC Flow TSG Flow Trans Flow HPD Flow HPReg Dis Flow LPD Flow Lab Feed Flow Lab Waste Flow Lab Inst Flow PCO2 Conc. Flow SBTemp Seakeepers Cell Press. Temp. Cond. SeaKeepers Chem PPM O2 % O2 pH Ch SeaKeepers TS SST Salinity SeaKeepers Flow PVDF Flow All Sky Imager Opaque Clouds Thin clouds Total Cloud
String Written to File
17 October 2006 14:29:21 32 19.4771 N 64 49.9100 W 0.0 0.0 + 32.3246 -64.8318 32 19.5027 N 64 49.8048 W 0.0 31.4 + 32.3250 -64.8316 26.26 0.0 0.0 0.3 0.1 360.1 124.9 11.7 132.3 0.0 0.2 15.4 4.7 2.5 9.9 36.3 23.9 -11.0 1016.7 9.9 62.6 23.0 63.5 12.0 38.0 12.0 64.9 13.0 30.0 13.0 56.3 27.1166 5.7568 NaN 36.6325 95.3 0.05214 30X 0.48334 30X 0.0 0.0 0.0 0.0 0.8 0.2 1.8 0.7 0.8 0.5 0.2 0.1 0.0 456.9 -0.0 25.3005 1.8 28.1150 57.9760 0.20 3.10 14.55 255.90 -31.0750 36.1460 0.8 2.0 31 13 44% yes //// //// //// 0.0 0.0 0.0 0.00000 0.0 229.80 117.25 28.86 32 19.4861 N 64 49.9037 W 0.0 0.0 + 32.3248 -64.8317 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.00 0.00 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 27.02
Socket Server
dstp://activevids/Lister
File Interval
1 hour
Filename
Vids Data List
Time to Next Update:
5.67
Update Interval (S)
10.00
Store Configuration
Recall Configuration
Timed Out
Data Logging
Exit

Components of VIDS


Sensors


Interface - Transport

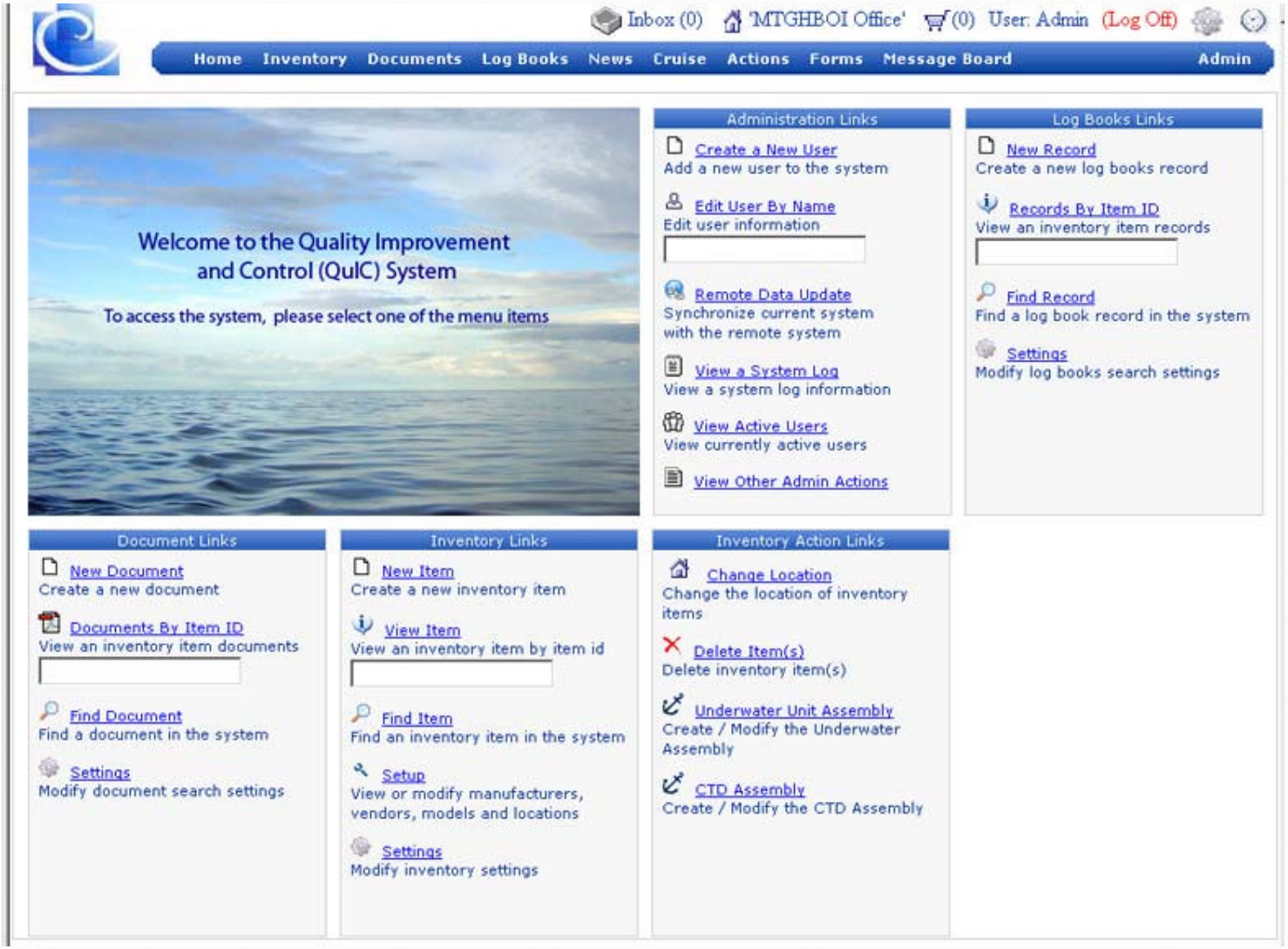

Collection Software


Storage - Redundancy


Display

QuIC Metadata

Metadata


Inbox (0)
'MTGHBOI Office'
(0)
User: Admin
(Log Off)
Home
Inventory
Documents
Log Books
News
Cruise
Actions
Forms
Message Board
Admin
Welcome to the Quality Improvement and Control (QuIC) System
To access the system, please select one of the menu items
Administration Links
Create a New User
Add a new user to the system
Edit User By Name
Edit user information
Remote Data Update
Synchronize current system with the remote system
View a System Log
View a system log information
View Active Users
View currently active users
View Other Admin Actions
Log Books Links
New Record
Create a new log books record
Records By Item ID
View an inventory item records
Find Record
Find a log book record in the system
Settings
Modify log books search settings
Document Links
New Document
Create a new document
Documents By Item ID
View an inventory item documents
Find Document
Find a document in the system
Settings
Modify document search settings
Inventory Links
New Item
Create a new inventory item
View Item
View an inventory item by item id
Find Item
Find an inventory item in the system
Setup
View or modify manufacturers, vendors, models and locations
Settings
Modify inventory settings
Inventory Action Links
Change Location
Change the location of inventory items
Delete Item(s)
Delete inventory item(s)
Underwater Unit Assembly
Create / Modify the Underwater Assembly
CTD Assembly
Create / Modify the CTD Assembly

Software Sharing

- Available for use by UNOLS and INMARTEC community.
- Would hope that others would use and add new and improved VIs and share.

Contact Information

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