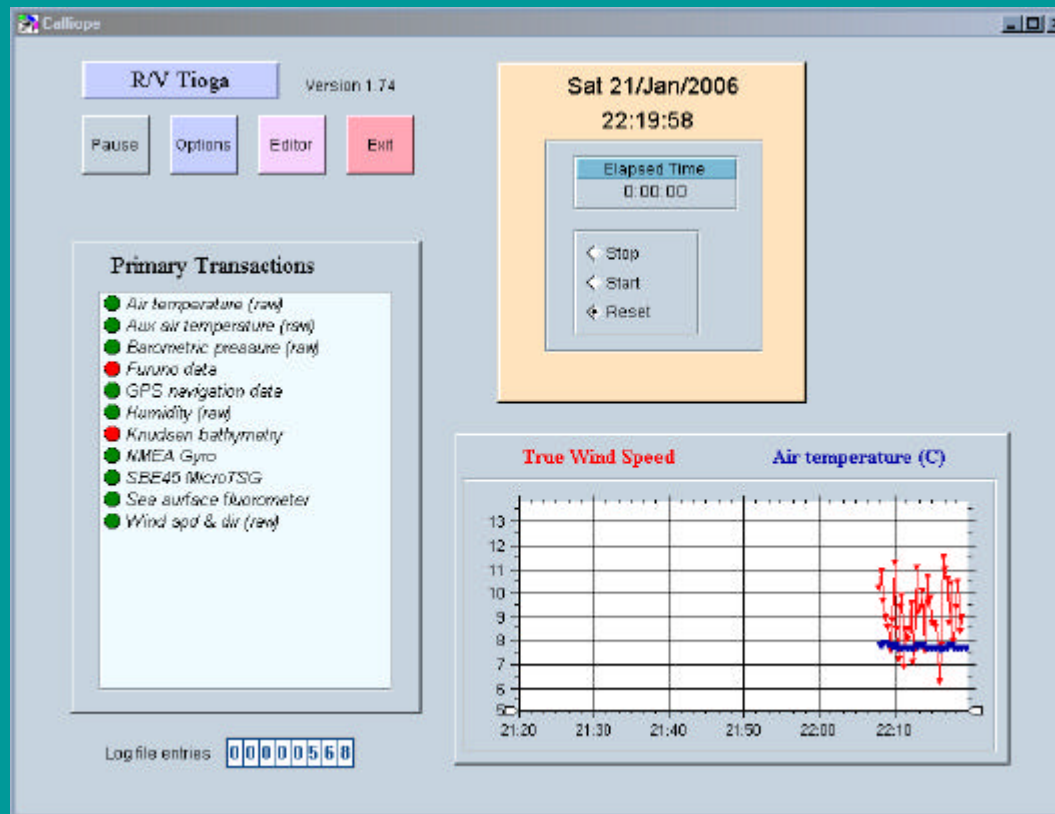


Calliope

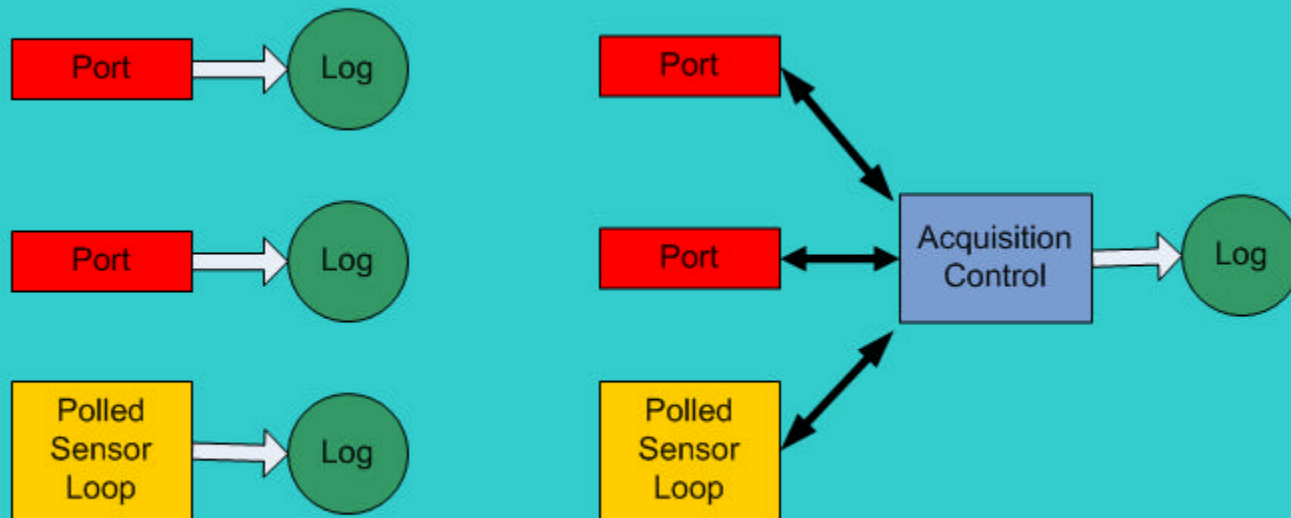
Underway Data Collection

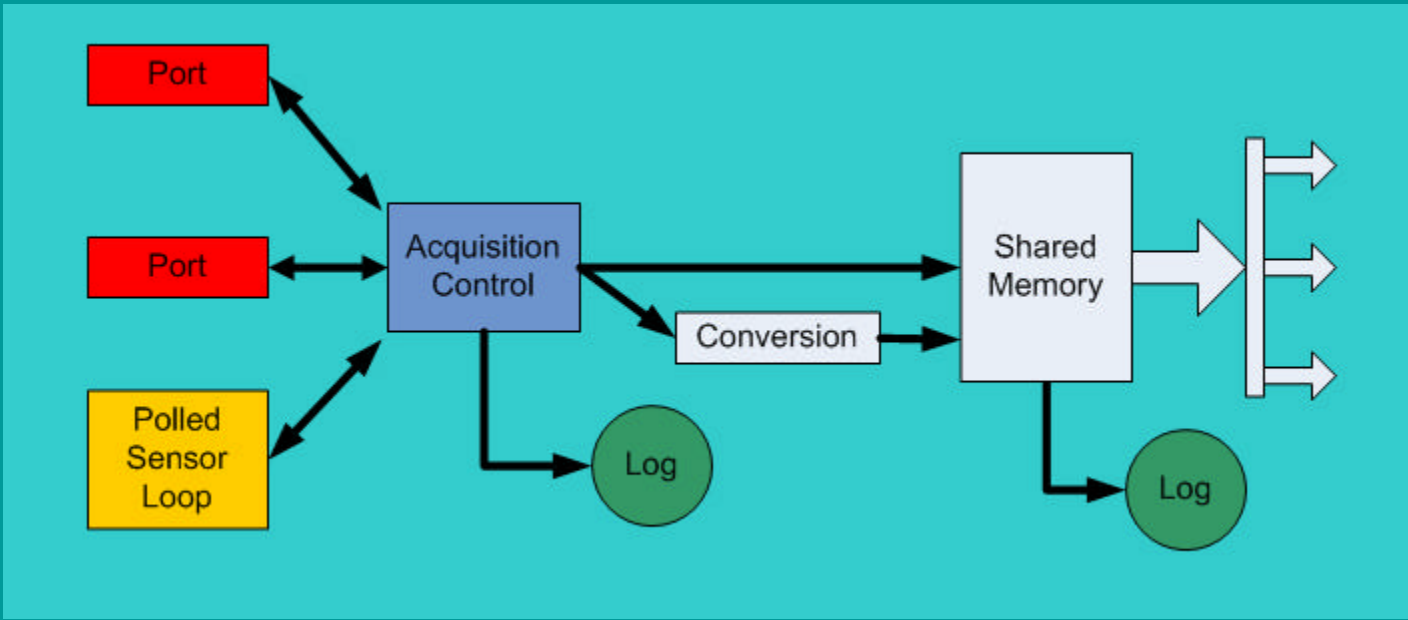
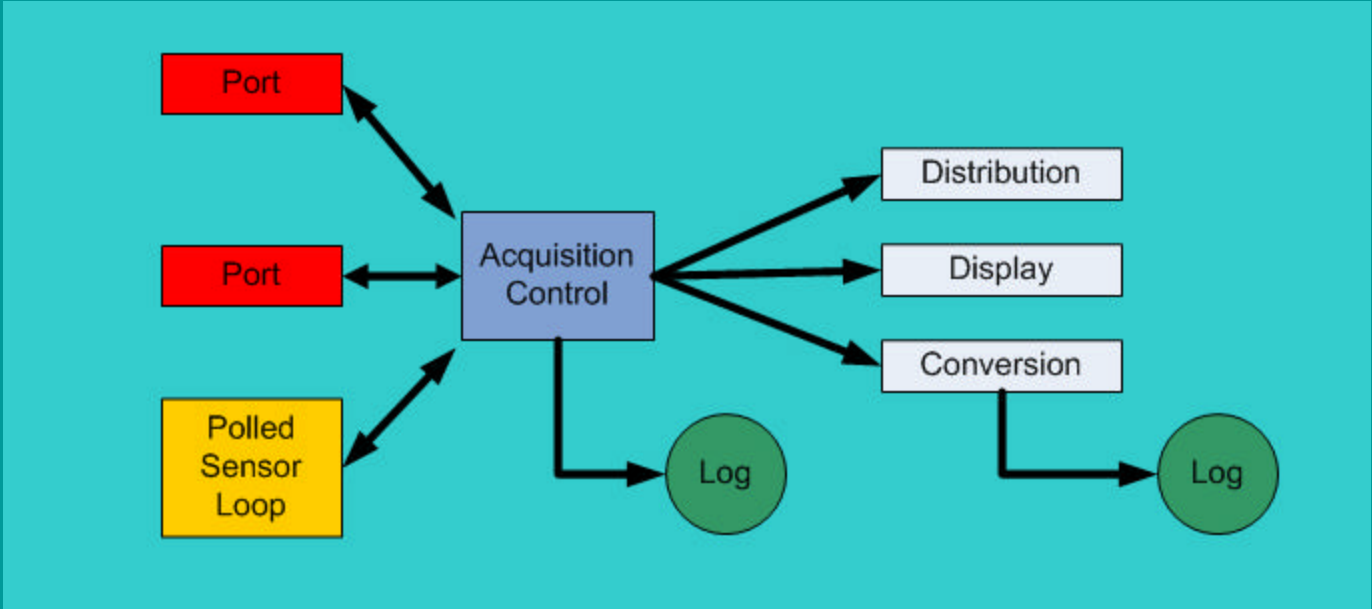


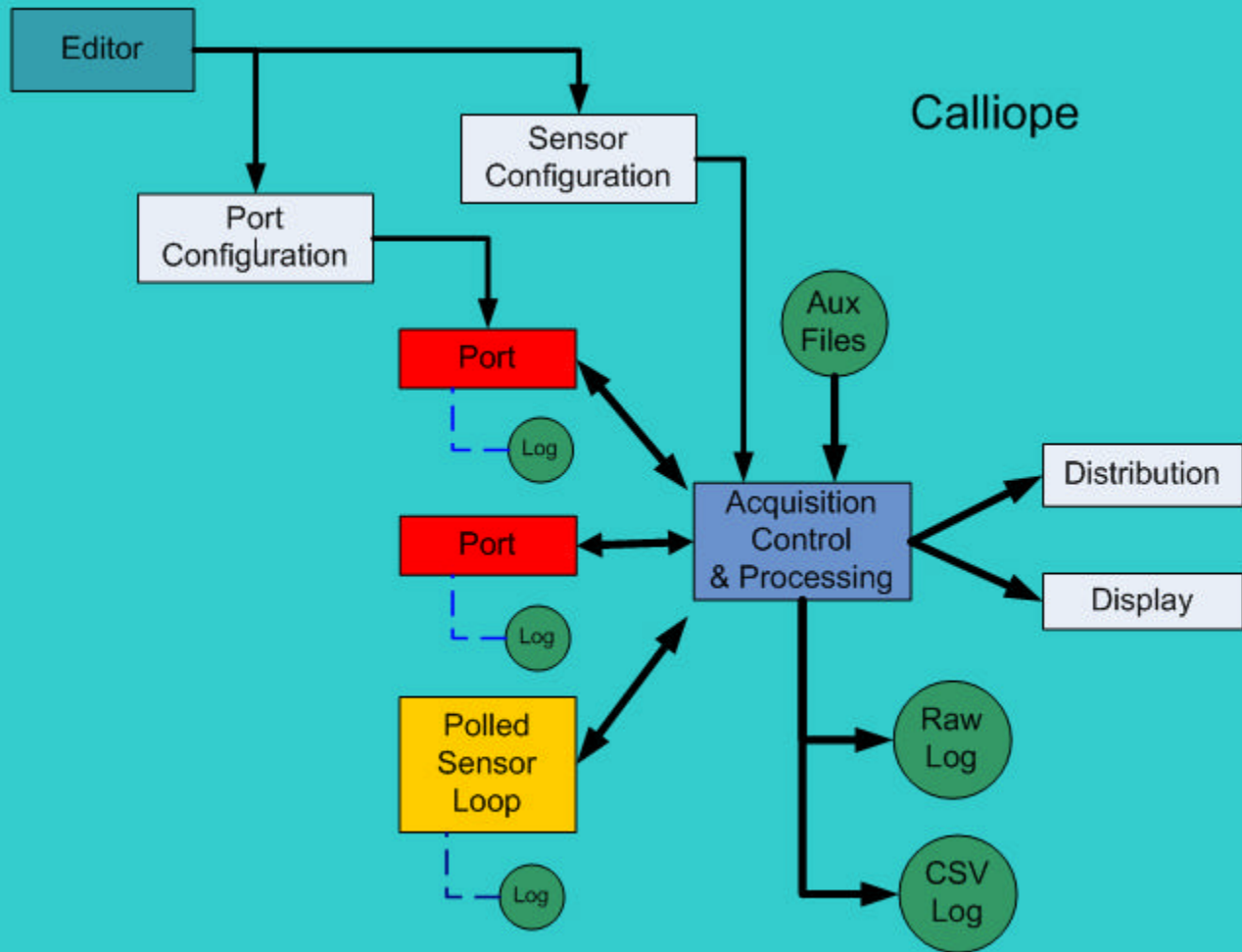
Calliope Application Requirements:

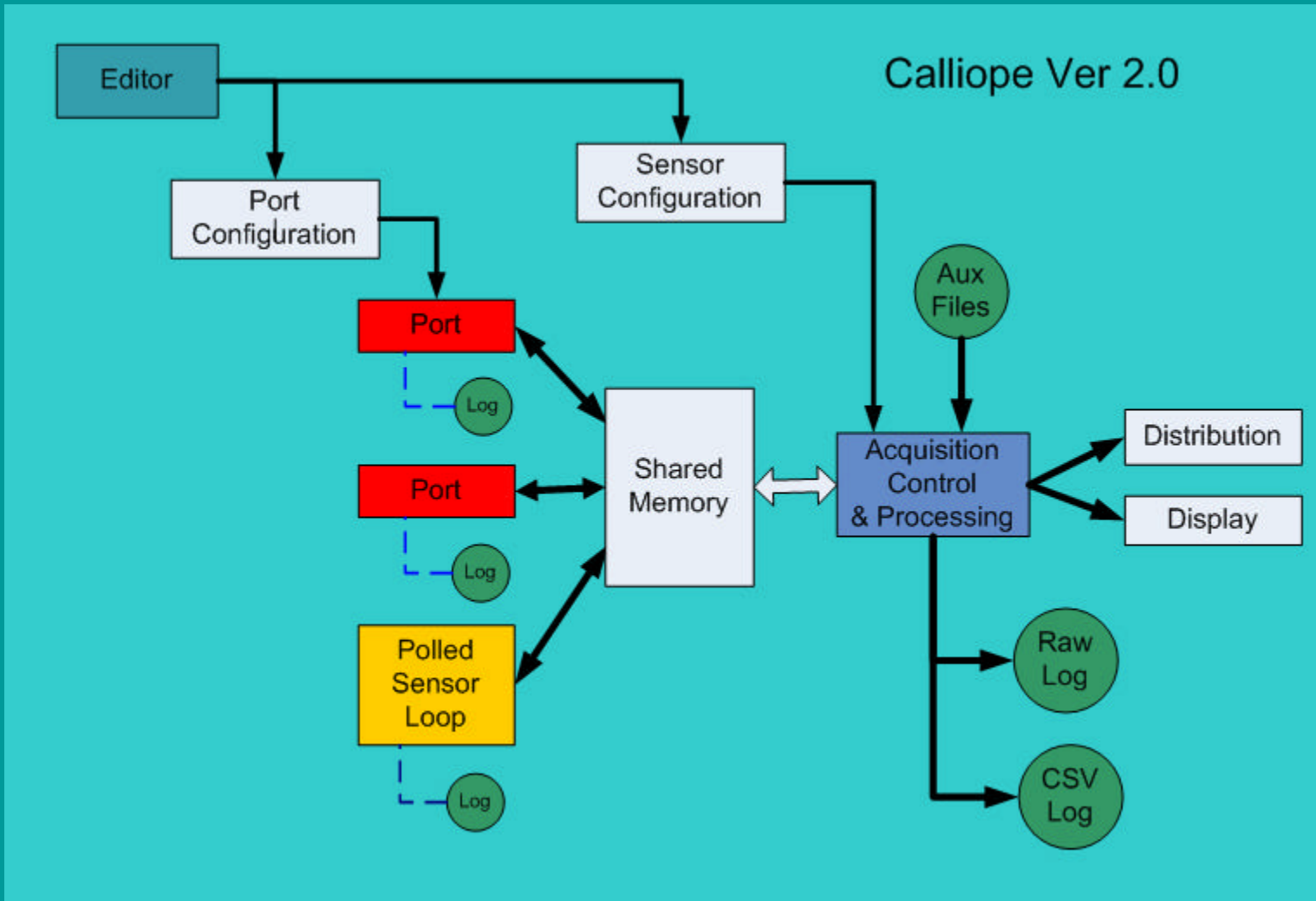
- Sensor Initialization
 - Sensor Detection
- Obtain Raw Data
 - Continuous
 - Polled
- Parse, Modify, Combine
 - Calibrations
 - Derivations
- Timestamp & Log
 - Multiple files & formats
- Re-Issue Selected Data
 - Multiple ports
 - Multiple formats
- Display, Quality Test, Post Warnings

Data Collection Possibilities









Calliope's Main Console Display

R/V Oceanus Version 1.99

Pause Options Editor Exit

Primary Transactions

- Acoustic wind sensor
- FSI sea surface conductivity
- FSI sea surface temperature
- Hull temperature
- IMET Wind
- IMET precipitation
- Knudsen bathymetry
- NS952 GPS BWR
- NS952 GPS GPGGA
- NS952 GPS GPVTG
- NS952 GPS RMC
- NS952 GPS ZTG
- Pressure, Temperature, Humidity
- SBE45 thermosalinograph
- Sea surface fluorometer
- Shortwave radiation
- Sperry MK37 Gyro
- Sperry speedlog

Log file entries 00033722

Mon 16/Oct/2006
21:30:46

Elapsed Time
0:00:00

< Stop

Configuration problems:
SSV

Caution: Data collection has been paused!
Data item required by SSV is not available
OK

Air temperature (C) **Hull temperature (C)**

18
16
14
12
10

17:00 17:30 18:00 18:30 19:00 19:30 20:00 20:30 21:00 21:30

Time (C)	Air temperature (C)	Hull temperature (C)
17:00	12.5	16.5
17:30	12.5	16.5
18:00	12.5	16.5
18:30	14.0	16.5
19:00	13.5	16.5
19:30	13.5	16.5
20:00	13.5	16.5
20:30	14.0	16.5
21:00	13.5	16.5
21:30	12.5	16.5

Editor Tree with Sensor Information Entry Window

The screenshot displays the Calliope software interface. On the left is an editor tree with a hierarchical structure of sensors and components. The 'Temperature' sensor under 'Com6' is selected. On the right is the 'Transaction Editor' dialog box, which is used to configure the selected sensor's data collection parameters.

Editor Tree:

- Com1
- Com5
- GPS
- Com6
 - Barometric pressure
 - MetraByte#1
 - Raw temperature
 - Temperature (Selected)
 - Shortwave radiation
 - Wind
- Com7
 - New item test1
- Com8
- Com9
- Com10
- Com11
- Com12
- Null
- UDP Out 5009
- UDP In 10500
 - New Item test2
- UDP Out 10510
- Conversion
- Code Event
- File Entry
- External
- Direct
- Internals
- Constants
- New

Transaction Editor:

- Full name: Temperature
- Priority: 0
- Status: Active
- Designator: Temp
- Source: TMP_Raw
- Sensor type: Secondary
- Not required: None
- Data type: Single value
- Units: C
- Address: (empty)
- Response timeout: 0.25
- Service interval: 10
- Event Dsgntr: None
- Log cycle: 0
- Terminator & Count: (empty) | 1
- CSV file

Buttons: View, Define, Done, Cancel, Additional, Functions, UDP Port #'s, Metadata, OK, Requ

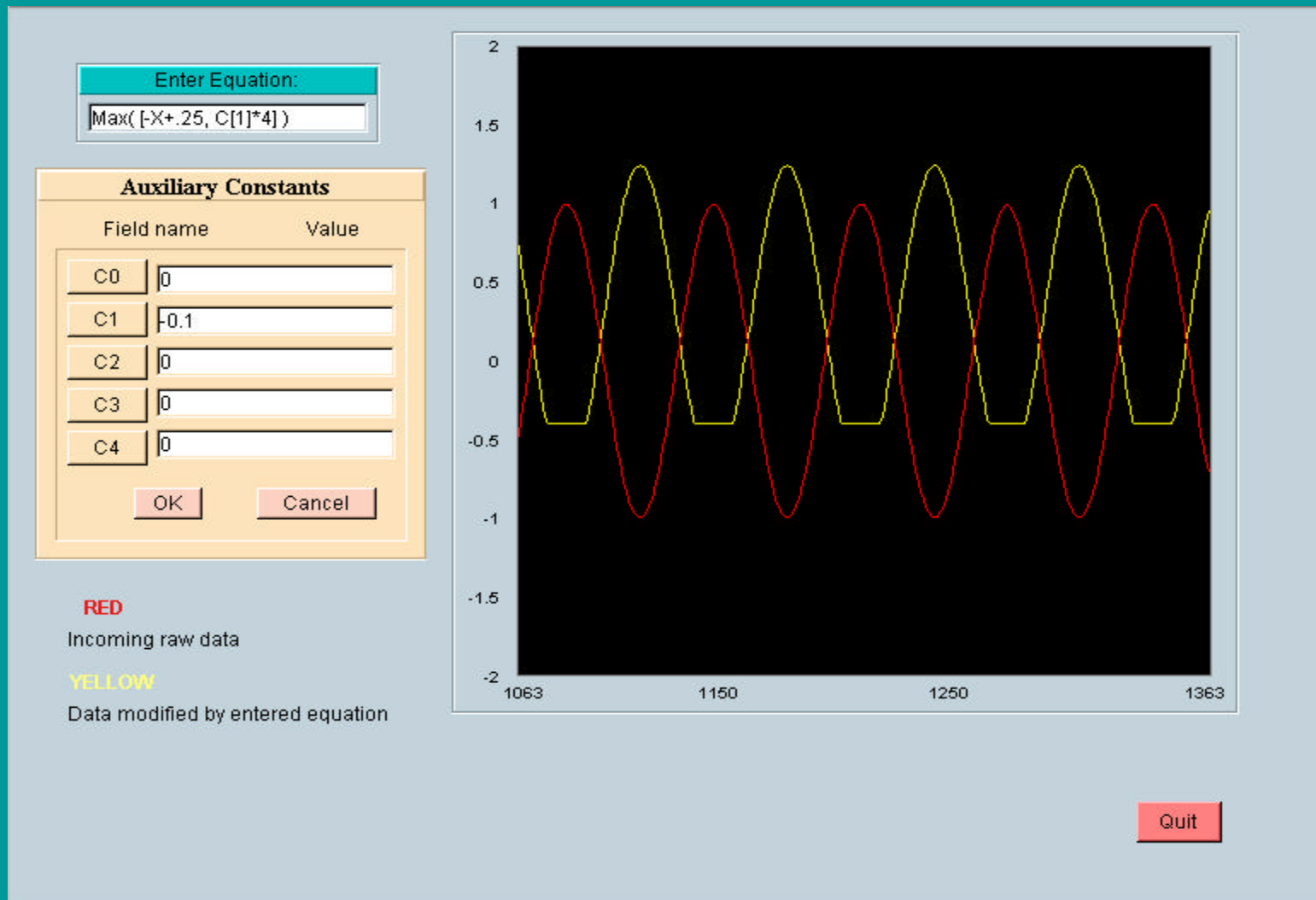
Calliope development has been done with Agilent Vee.

Vee is a graphical programming language optimized for test and measurements applications. It is powerful and also easy to learn and use.

Vee provides the ability to modify the data acquisition process without changes to the primary application code. This feature is of fundamental importance to the Calliope data handling system since it allows complete configuration using information stored in external files or entered by the user.

The following examples show how incoming data can be processed in accordance with equations entered by the user while the application is running.

Incoming data plotted in red has been modified in accordance with the equation and auxiliary constants entered by the user



Incoming data sample

Source data & parsed values:

X[0]=\$GPGGA,000656,4209.544,N,06920.640,W,1,09,0.89,0,M,...*

X[1]=\$GPGGA	X[9]=0.89
X[2]=000656	X[10]=0
X[3]=4209.544	X[11]=M
X[4]=N	X[12]=
X[5]=06920.640	X[13]=
X[6]=W	X[14]=
X[7]=1	X[15]=
X[8]=09	X[16]=25

Entered equation

Enter equation - (Literals need quotes)

NMEA(["PWDLL", decimal_latlon(X[0])])

Done

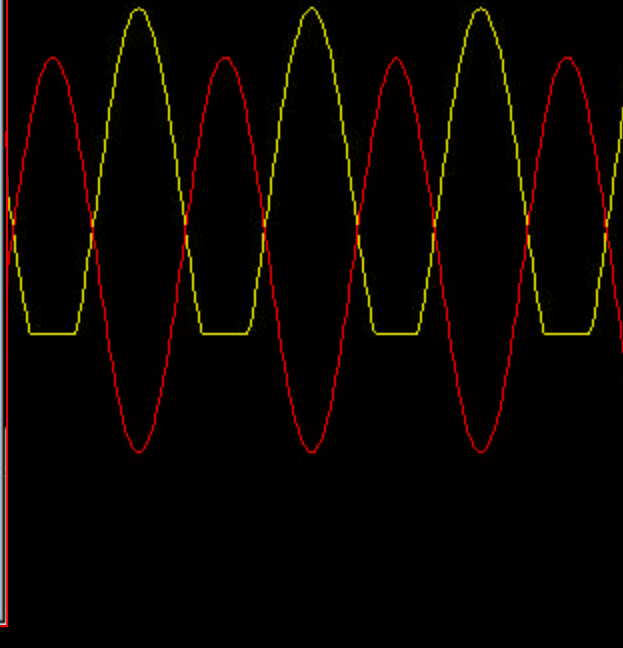
\$PWDLL,42.159067 -69.344000*64

Help

Cancel

OK

Parsed data



YELLOW

Data modified by entered equation

Sample result

\$PWDLL,43.601767 -68.728133*66

Real-time display

Quit

Equation entry with the Calliope editor

The screenshot displays the Calliope editor interface. At the top, a window titled "SSV" shows a "Live" status and a value of "1520.1043". Below it, the "Transaction Editor" window is open, showing a list of "Defined data items" and a "Functions" list. The "Functions" list includes:

- psi2meter(psi)
- hms_toSec(hh:mm:ss)
- lat_dhm
- linear
- lon_dhm
- psi2meters
- arrayElement(arr,ndx)
- charReplace(str,c1,c2)
- Fix(str,W,D)
- NMEA([str1,str2,...])
- Pad(str,len,char)
- PadRt(str,len,char)
- Rnd(num,D)
- strExtract(str,n1,n2,delims)
- strReplace(str,str1,str2)
- toNum(str)

The "Defined data items" list includes:

- GPS speed over ground
- GPS type
- Gyro heading
- IMET air temperature
- IMET barometric pressure
- IMET longwave radiation
- IMET precipitation
- IMET relative Humidity
- IMET shortwave radiation
- IMET temperature
- IMET temperature & humidity
- IMET Wind
- Knudsen bathymetry
- MetraByte #1
- MetraByte #2
- NMEA Gyro
- Position (decimal lat & lon)
- Salinity
- Sea surface fluorometer
- Ship speed (Sperry)
- Sound velocity
- Sperry speedlog
- Station data input
- Time
- Tivey compass
- True wind direction
- True wind speed
- True wind speed & direction
- Turner fluorometer data
- Turner fluorometer range

The "Equation entry" dialog is open, showing the equation: `"S"+Fix(asReal32(SSV.value)*10,5,0)+"\013\010"`. Below the equation, a message reads: "Literals need quotes; Sensor variables need ".value"". The dialog also shows a preview of the output: `S1520100`. Buttons for "Help", "Function List", "Clear", "OK", and "Cancel" are visible at the bottom of the dialog.

Calliope

- Com1
- Com5
 - GPS
- Com6
 - Barometric pressure
 - MetraByte#1
 - Raw temperature
 - Temperature
 - Shortwave radiation
 - Wind
- Com7
 - New item test1
- Com8
- Com9
- Com10
- Com11
- Com12
- Null
- UDP Out 5009

UDP Out 5009

```
#WIND      \00921:25:13\0090.00  0.00  0.0  0.0  0.0  0.0  120.9  0.0  0
#BAR       \00921:25:23\0091011.98 >>>
#TMP_Raw   \00921:25:24\00921.588  1084.395  115299  26787 >>>
#Wnd       \00921:25:23\0090.00  0.00  0.0  0.0  0.0  0.0  120.9  0.0  0
#BAR       \00921:25:33\0091011.98 >>>
#TMP_Raw   \00921:25:34\00921.588  1084.395  115299  26787 >>>
#Wnd       \00921:25:33\0090.00  0.00  0.0  0.0  0.0  0.0  120.9  0.0  0
```

OK Print Hold Continue Clear

Checking defined data
broadcast by monitoring
UDP port output

WEB based data display using Calliope UDP data broadcast

IDAQ R/V Atlantis ShipDataGrabber System v1.0 - Microsoft Internet Explorer

IDAQ CurrentTime: 2004/09/16 19:36:53 GMT

DaqState VideoServer ShipData Asnap Next: ---- (sec)

Port=5008 Event:

TimeStamp: 2004/09/05 00:20:28 Gyro: 125.80 Lat: 47.65 Lon: -122.36 SpdLg:

EType: HdChkSum: 62=62 GPS COG: 126.60 GPS SOG: 3.20 Depth12: Depth35:

SSCND:	46.33	min: 46.33	max: 46.33	Salinity:	31.9524	min: 31.9524	max: 31.9524
SSTMP:	22.29	min: 22.29	max: 22.29	Fluorometer:	79.90	min: 79.90	max: 79.90
AirTemp:	18.61	min: 18.61	max: 18.61	WndSpd:	1.67	min: 1.67	max: 1.67
BarPres:	1016.02	min: 1016.02	max: 1016.02	WndDir:	358.60	min: 358.60	max: 358.60
RelH:	57.43	min: 57.43	max: 57.43	<input type="button" value="Reset Min/Max Values"/>			
SWR:	133.30	min: 133.30	max: 133.30	<input type="button" value="View All Plots"/> <input type="button" value="Update Plots"/>			



Simulate Data Simulate Images Display CSV View: [Config File](#) [Data Dict](#) [DAQ Log](#) [AxisServer Admin](#)

My Computer

DAQ.Atlantis.AT11-16
GMT: 2004/09/05 20:00:17
DataTime: 00:21:44
ShipDataSrc: CSV

Gyro: 126.40 deg
Lat: 47 39.000000 N
Lon: 122 21.600000 W

COG: 126.80 deg
SOG: 2.70 knt
SpdLg: knt
12 kHz:
3.5 kHz:

SSTMP: 22.30 degC
SSCND: 46.35 mmho/cm
Salinity: 31.9548 psu
Fluor: 79.90 mv

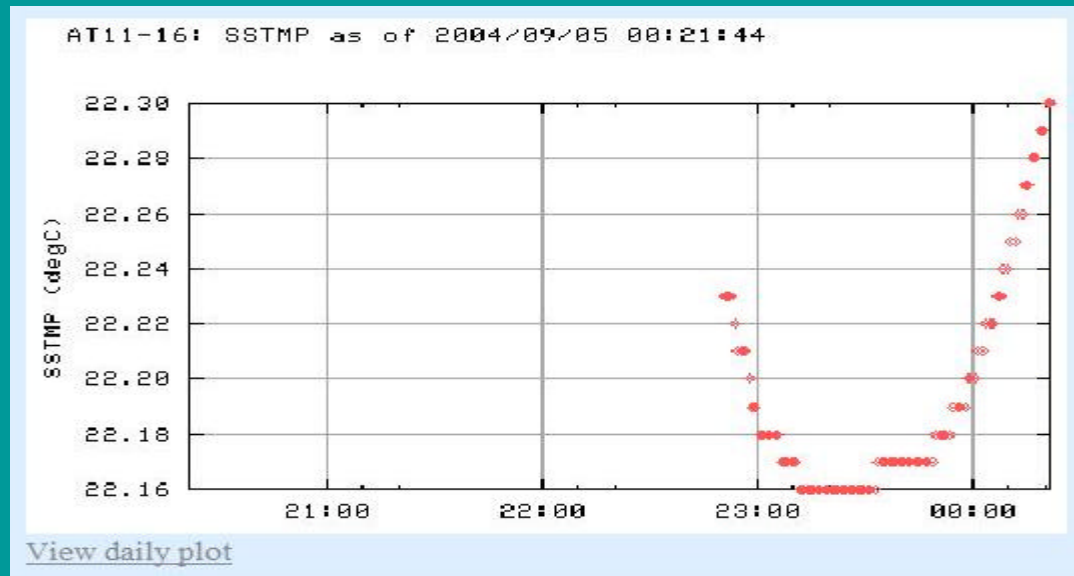
AirTemp: 18.53 degC
BarPres: 1015.97 millibar
RelH: 56.98 %
SWR: 217.40 w/m²

WndSpd: 1.67 m/s
WndDir: 48.20 deg

Alternate Units

SSTMP: 72.14 °F **AirTemp:** 65.35 °F **WndSpd:** 3.25 knots

Real time displays



Alvin navigation display based upon Calliope data input

GYRO true DOP true

from to

brg: 250 °T range: 96 m

DOP: X=2801 Y=5980

LBL: X=2718 Y=5989

XY

100 m/div

HDG octans: **89.0** °T

Depth paro1: **2654.0** m

ALT dop ht: **5.3** m

COG: **89** °T

SOG dop bt: **10.1** m/min

Z Vel paro1: **-1.2** m/min

ETB paro1: **22:23** gm ↓

TWD paro1+dop: **2659** m

DOP: Bottom Lock **Good**

XY Map

Zoom In Zoom Out

CTR SHIP Map Grid

CTR DOP Show Trail

CTR LBL UNITS

CTR CUR Auto CTR

Doppler

Reset 39min 6sec

RST LBL RST CUR

Cursor Pos: XY meters

X **2577.0**

Y **5866.0**

Target

TGT DOP TGT LBL

LABELS TGT CUR

trail length

▲

▼

SNAP

I/O Status

R T err

■ dop

■ oct

■ hst

■ bin

DOP GYRO dive # **22:18:35 GMT** **4246**

LOG Athena

LOG: D:\d\lnav_raw\2006_09_18_22_00.DAT

LOG: D:\data\d\lnav\2006_09_18_12_45.CSV

Disk D: 5d 23h 32m (51% full)

INI File: C:\DVLNav\inifiles\4246

50% 62%

D: CPU

