

ENVIT:

HydroLab Probe Division

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# Tasks

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- Provide “black box” of device
- Enable serial communication between IPAQ and HydroLab
- Enable user to calibrate HydroLab and collect water quality data
- Provide user with error and range check
- Define time-outs for data collection

# Group Progress

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- Read HydroLab manual
- Researched serial communications
- Attempted to set up serial connection
- Developed preliminary list of functions and units
- Researched calibration requirements
- Developed preliminary list of errors

# Functions

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- Depth
- Temperature
- pH
- Dissolved Oxygen
- Total Dissolved Gas
- Conductivity (salinity)
- Redox
- Chloride
- Ammonium
- Nitrate

# Example: Temperature

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- Select function: Temperature
- Select units: K, C, F
- Multiple samples?
  - Enter start and end times
  - Enter time interval

# Example: Dissolved Oxygen

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- Select function: DO
- Prepare sensor for calibration
  - Instructions for calibration preparation in README.doc
- Calibrate
- Enter barometric pressure (mg Hg)
- Calibration error check
- Select units: % saturation, mg/L
- Multiple samples?
  - Enter start and end times
  - Enter time interval

# Potential Errors

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- HydroLab off or improperly connected
- Function called by user not calibrated
- Calibration expired
- HydroLab data not within valid range
- Serial port in use by other application

# Serial Communication

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- C++ installed on IPAQ
- Serial connection established
- Encoded query message sent to HydroLab's Series 4 TTY interface packet
- Encoded response message returned to IPAQ
- Response decoded

# Encoded Message Frame

START	ADDRESS	FUNCTION	DATA	LRC CHECK	END
1 CHAR	2 CHARS	2 CHARS	n CHARS	2 CHARS	2 CHARS CRLF

# Encoded Query Message

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QUERY	5 bytes
Field Name	
Slave Address	aa
Function	40h
Data Block Size	00h
CRC Error Check	___

# Encoded Response Message

RESPONSE	60 bytes
Field Name	
Slave Address	aa
Function	40h
Data Block Size	37h
Manufacturer String	%16s
Serial Number	%8s
Model String	%16s
Software Revision String	%5s
MODBUS Support Revision String	%5s (“1.00” for this revision)
CRC Error Check	—

# HydroLab Probe Division Needs

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- Hardware/Field Equipment Division
  - HydroLab
  - IPAQ
  - Serial connection
  - IPAQ/Desktop Synchronizer

# HydroLab Probe Division Needs

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- User Interface Division
  - Ability to select multiple parameters
  - Inability to select multiple parameters in use by the same sensor
  - Ability to select units for each parameter
  - Calibration prompts
  - Ability to enter start/end/interval times

# HydroLab Probe Division Needs

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- Database/Wireless Division
  - Ability to accept and organize sample data

# Timeline

ID	Task Name	Oct 14 2001					Oct 21 2001					Oct 28 2001					Nov 4 2001					Nov 11 2001					Nov 18 2001					Nov 25 2001																			
		19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30							
1	Define parameters and respective units	█	█	█	█	█	█	█	█																																										
2	Define calibration screens			█	█	█	█	█	█																																										
3	Define possible errors and respective screens																█	█	█	█	█	█	█	█																											
4	Discuss our needs with the User Interface Division	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█																												
5	Discuss our needs with the Database/Wireless Division	█	█	█	█	█	█	█	█																																										
6	Write readme.doc for calibrations																█	█	█	█	█	█	█																												
7	Write HydroLab section for the troubleshooting readme.doc																														█	█	█	█	█	█	█														
8	Encode serial connection between HydroLab and IPAQ	█	█	█	█	█	█	█	█																																										
9	Encode to enable data sampling																█	█	█	█	█	█	█																												
10	Debug simple data sampling code																							█	█	█	█	█	█																						
11	Encode to include for possible errors																														█	█	█	█	█	█	█														
12	Debug final code																																					█	█	█	█	█	█	█							
13	Prepare final presentation																																												█	█	█	█	█	█	█

# Contributors

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