Main /
UmiatBaseInformation

Umiat Base Station Information

The Umiat Base Station supports the NPRA North Slope Lakes Project Data Network, including cooperator sites. It also supports Video Camera operations for the Umiat Airfield Base Station and BLM flight and field operations in NPRA.

Photo Archives

The Base Station components include;

Communications System
- Hughes satellite dish and modem
    - Original 2006 Installation: Starband satellite dish and modem
- Moxa 4-Port Portserver
- Freewave Base Station Radio

Umiat Hybrid Power System
- Design/Installation by Remote Power Inc./ GW Scientific
- Original 2006 Installation
    - OutBack Solar and Wind Control System
        - PS2AC-50D, FX 2012T Inverter, PS2DC-250, Xantrex C-40 charge control, MX60 charge control
    - (6) Kyocera KC130TM 130 Watt Solar Panels, connected in 2 groups of 3
    - (3) Air Wind turbines (12V)
    - Concorde 1040T and 1080T 12-volt batteries, connected in parallel, (5x108 Amp-hrs), 540 Amp-hrs per bank for 1080T's and (5x104 Amp-hrs) 520 Amp-hrs per bank for 1040T's. Configuration for a 5-battery bank, 4 sets of 5-battery banks, total 20 batteries. Total Amp-hrs installed on 9/12/06 is 2104.

- AsBuilt Information - From installation in Fall 2006 to Fall 2009, slight modifications to the systems where made
    - The current Hughes Dish/Modem replaced the Starband satellite system
    - The wind turbines were taken down for storage

- Fall 2009 Power System Upgrade Plans (Installation planned August 27 to Sept 2)
    - 40 additional batteries will be added to the system, 1040T's, This will add 4,160 Amp-Hrs to the system, as a separate battery bank
    - The 3 wind turbines will be re-installed, 1 will be in a different location
    - The CR10X will be replaced with a CR1000
    - The two battery banks (Old 2104 Amp-hr bank, New 4,160 Amp-hr bank) will be controlled by the CR1000 through a 12 V relay
    - Additional AC relays will be installed to control attached AC devices
    - An additional Stardot Camera will be installed for security purposes
    - Current sensors will be installed to measure selected loads on the system
    - To-Do_UmiatBase1: doc, Word File, Last Update: 8/18/09, Jeff Derry

- New System Design Goals
    - Operate all winter off camp power
    - Main loads are Hughes Net Modem, Total Precipitation sensor, Stardot Cameras, Radio Base Station (Freewave), Data

Acquisition System
- Operational Priorities (in order)
  - Communication system (Hughes Modem, Freewave radio, data acquisition system)
  - Stardot cameras (may be only a few images per day, may be reduced during winter to one image per day
  - TPS sensor (highest load)
  - Camp use when BLM staff present (will be on generator power)

Relay Control Guidelines -- Updated by AMcHugh 10/08/2009

- Hughes Modem and Router (shared power cable)
  - Relay default is ON, Modem power cycled off for 10 seconds once a week at 1 minute past midnight Saturday night. (current configuration)
    - Future consideration - add on/off times; add manual/auto control

- Video Cameras (all video cameras on one relay, all ON or all OFF)
  - Relay default is On
  - Has manual and automatic modes
  - Can be manually toggled ON/OFF through Loggernet
  - Have Daily set ON time and OFF time
    - Currently (9/18/09) On at 06:00; Off at 22:00
  - In either Automatic or Manual Modes
    - Will toggle off if Active Battery Bank is < 12.0 volts (2-hour running-average)
    - Will turn back on when Active Battery Bank is > 12.2 volts(2-hour running-average)

- Video Camera Heaters (all video camera heaters on one relay, all ON or all OFF)
  - Relay default is On
  - Has manual and automatic modes
  - Can be manually toggled ON/OFF through Loggernet
  - Have Daily set ON time and OFF time
    - current On at 12:00(noon); Off at 13:00
  - In either Automatic or Manual Modes
    - Will toggle off if Active Battery Bank is < 12.3 volts (2-hour running-average)
    - Will turn back on when Active Battery Bank is > 12.5 volts(2-hour running-average)
    - If cameras are OFF, then heaters are always OFF

- Total Precipitation Sensor (TPS)
  - Relay default is On
  - Has manual and automatic modes
  - Can be manually toggled ON/OFF through Loggernet
  - In either Automatic or Manual Modes
    - Will toggle off if Active Battery Bank is < 12.0 volts (2-hour running-average)
    - Will turn back on when Active Battery Bank is > 12.2 volts(2-hour running-average)

- Battery Bank Relay
  - Relay default is Battery Bank B (new ~4,160 amp-hrs)
  - Can be manually toggled through Loggernet
    - Future control could include switching on Battery Bank B conditions

Data Collection
- OutBack Mate and Hub Interfaces
- EEInternet Outback Mate Analysis System
- 2006 Installation: CR10X-PB Data Logger, AM16/32 multiplexer, CVD20 Voltage Divider
  - (4) GWS/YSI battery-box thermistor sets (3 thermistors each)
  - (1) HMP45C Air Temperature, Relative Humidity Sensor (in equipment shelter)
  - (3) Shunts

- Fall 2009 Installation: CR1000, AM16/32 multiplexer, CVD Voltage Divider
  - (4) Old Battery Bank: GWS/YSI battery-box thermistor sets (3 thermistors each)

- (8) New Battery Bank: GWS/YSI battery-box thermistor sets (3 thermistors each)
- (1) HMP45C Air Temperature, Relative Humidity Sensor (in equipment shelter)
- (3) Shunts
- (6) Current sensors (Total Precipitation Sensor (TPS), Hughes Modem, Stardot Camera Heater 1, Stardot Heater 2, Stardot Heater 3, Stardot cameras (common))
- other measurements ?

Wiring Diagrams and Schematic
- Original Installation Diagrams, As-Built to August 2009
  - System Overview, Original As-Built, Sheet 1 of x: General_Schematic.sdr, Smartdraw File, General_Schematic.pdf
  - Solar Panel Array As-Built, Sheet 2 of x:SmartDraw File, PDF File
  - Battery Bank (A) As-Built, Sheet 3 of x: See Below
  - CR10X - Outback As-Built, Sheet 4 of x:CR1000 Wiring Diagrams
  - AM16.32 Multiplexer Wiring Diagram, Sheet 5 of x:CR1000 Wiring Diagrams
- 2009 System Upgrade Diagrams
  - System Overview, Original As-Built, Sheet 1 of x: Same as Above
  - Solar Panel Array As-Built, Sheet 1 of x: Same as Above
  - Battery Banks (A,B), Sheet 1 of x:SmartDraw File, PDF File
  - CR1000-AM16/32-SunSaver10, Sheet 1 of 14: CR1000 Wiring Diagrams
  - Power System Upgrade Wiring Diagram, Sheet 2 of 14: CR1000 Wiring Diagrams
  - CR1000-Relays, sheet 3 of 14: CR1000 Wiring Diagrams
  - CR1000-Met Sensors & Current Sensors, Sheet 4 of 14: CR1000 Wiring Diagrams
  - AM16/32-Power, Sheet 5 of 14: CR1000 Wiring Diagrams
  - AM16/32-Thermistors & Thermocouples, Sheet 6 of 14: CR1000 Wiring Diagrams
  - Battery Bank Switch wiring drawing, Sheet 7 of 14: CR1000 Wiring Diagrams
  - Relay Details, Sheet 8 of 14: CR1000 Wiring Diagrams
  - CS10 Current Sensor Details, Sheet 9 of 14: CR1000 Wiring Diagrams
  - Breaker Switch Details, Sheet 10 of 14: CR1000 Wiring Diagrams
  - Xantrex Charge Control Details, Sheet 11 of 14: CR1000 Wiring Diagrams
  - Moxa Serial Device Server Details, Sheet 12 of 14: CR1000 Wiring Diagrams
  - Outback Hub Details, Sheet 13 of 14: CR1000 Wiring Diagrams
  - PS2AC-50D Details, Sheet 14 of 14: CR1000 Wiring Diagrams
- PowerPoint Details for Various System Components
  - Wind turbine wiring and sensor details: Umiat_Base_Station_Wind_Turbine_Wiring09a.ppt, 1.2 Meg, Power Point File

August 2009 Field Schedule
- August 27, Thursday
  - Michael, Jeff arrive in Umiat, get staged
  - Start Battery Bank B installation
- August 28, Friday
  - Complete Battery Bank B installation
  - Noon, change CR10X with CR1000, hook up existing sensors, connections, test out program with existing setup
  - Afternoon, switch off power to Outback from battery banks, solar charging, wind turbines
  - Install battery bank relays, shunt
  - Restart system on Battery Bank B (new ~4K Amp-hr bank, verify operations under battery bank B
- August 29, Saturday
  - Verify Battery Bank controls through data logger
  - Start installation of new sensors to CR1000
  - Hook up 2 remaining wind sensors
- August 30, Sunday
  - Cleanup work on system
  - System function verification
- August 31, Monday
  - Evaluate any system modifications, put into place and test
- September 1, Tuesday
  - System performance verification
- September 2, Wednesday
  - System performance verification

- September 3, Thursday
  - System performance verification
- September 4, Friday
  - Installation complete

September 12-14, 2009 Rewiring
- HughesNet modem and webcam power supplies moved inside BLM Hut
  - Three additional power cables (modem,webcam, heaters) were run from the Outback to the BLM hut

February 2, 2010 Site Visit
- Draft Checklist: Umiat_Base_Site_Inspection_100202_mrl.doc, Word 2003 File, Last Update: 1/31/10, M. Lilly
- Draft Checklist Figures: Umiat_Base_100202_Site_Visit.ppt, 3.8 Meg, PowerPoint File, Last Update: 1/31/10, M. Lilly

References
- - OutBack Power Manuals (will open in new window)

Shipping
- Items shipped on Aug. 20, 2009, Excel File, Last Update: 8/21/09, Jeff Derry
- Shipping Labels, Word File, Last Update: 8/23/09, Jeff Derry

Umait Base Station Power Analysis ORIGIN Files: August 15, 2009
- Note: Texas A&M Geoscience undergraduate students are helping work-up and analyze data for the Outback system
- David Clark's Origin File, Last Update: 8/4/09, Jeff Derry
- Kari Kelly's Origin File, Last Update: 8/19/09, Kari Kelly
- Elke Sauter's Origin File #1, Last Update: 8/12/09, Elke Sauter
- Elke Sauter's Origin File #2, Last Update: 8/12/09, Elke Sauter
- Elke Sauter's Origin File #3, Last Update: 8/12/09, Elke Sauter
- Elke Sauter's Origin File October, Last Update: 8/19/09, Kari Kelly

Umait Base Station Power Analysis Plots
- Plots From ORIGIN Files in WORD, Plots From ORIGIN Files in PDF Last Update: 8/26/09, Michael Lilly

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