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ISFS at CABL

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See <https://www.eol.ucar.edu/content/isfs-netcdf-files> for information on ISFS NetCDF files and the coordinate systems of 3D winds.

Network

For info and a diagram of the network topology see <https://internal.eol.ucar.edu/content/cabl> and https://internal.eol.ucar.edu/system/files/book_file_attachments/cabl_net.pdf.

This diagram is on the EOL internal site to prevent hackers from becoming intrigued.

Motes

The following motes will be deployed at the bao and ehs sites:

BAO and EHS Motes

dsm(id)	mote	sensor id (hex)	sensor
bao (7)	1	23	Tsoil
		20	Tsoil.x
		26	Gsoil, HFT
		28	Qsoil, ECHO
		2f	TPO1
	2	22	Tsoil.10cm
		23	Tsoil.20cm
		28	Qsoil.10cm
		29	Qsoil.20cm
	17	56	Rsw.in
		5b	Rsw.out
		67	Rpile.in
		6a	Rpile.out
5	3b	Wetness	
ehs(8)	4	49	power
		21	Tsoil
		22	Tsoil.x
		24	Gsoil, HFT
		2a	Qsoil, ECHO
	10	2f	TP01
		20	Tsoil.10cm
		21	Tsoil.20cm
		2a	Qsoil.10cm

		2b	Qsoil.20cm
	8	57	Rsw.in
		59	Rsw.out
		66	Rpile.in
		6b	Rpile.out
		39	Wetness
		2	49

After logging into a DSM, use the **md** or **mote_dump** commands to display the mote data. The first parameter is the DSM id, either 7 for bao or 8 for ehs.

md 7

This will show the currently reporting radio motes, as an ID, followed by binary jibberish. If all motes at a site are reporting, you should see ID1, ID2 and ID17 at bao, and ID4, ID10 and ID8 at ehs, as shown in the above table. The power motes are not displayed with **md** or **mote_dump**.

Then to see the calibrated data for a given mote, enter its id after the DSM id (and a comma). For example, to display the regular soil mote on the bao:

md 7,1

The reporting rates are low, you may have to wait up to 10 seconds to see the data, or longer if there is radio interference.



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Notes on Quality Control

Pressure

The pressure data was mostly correct throughout the duration of the project aside from a number of spikes that had to be removed between February 25th and March 4th, for the Irgason sensors. In all instances the data were obvious outliers.

Qsoil

The Qsoil signal at the EHS location experienced a signal degradation which worsened as the project progressed <<https://wiki.ucar.edu/display/cablisfs/2015/03/30/Qsoil.ehs+NA%27s>>. The corrupted signal was unrelated to moisture intrusion and suspected to be a byproduct of the wireless communication; therefore the sensor was rewired on March 16th to bypass the wireless link and establish a hard connection to the serial mote <<https://wiki.ucar.edu/display/cablisfs/2015/03/16/ehs+motes+rewired>>. There were some additional instances where the Qsoil measurements exhibited a degradation in signal and the data had to be removed. One such example was between the period of March 23rd 19:00 until March 25th 09:05 for the 10 and 20 cm sensors. These instances were obvious from an observational standpoint because of the transition in data resolution. There was also a significant degradation in data quality between March 30th and April 14th where "Qsoil.ehs" returned a highly digitized version of the signal. The data throughout this time was too corrupted to salvage and so it was all removed.

In addition to the edits listed above, there were several instances where spikes were removed from the data set.

Rpile

The humidity (as well as temperature) data was initially QC'd using the fan current of the TRH sensor as a cue for the data integrity. If the value of "Ifan" was at or near zero, the data was removed, as well as if there were abnormalities in the signal such as spikes deviating beyond the normal operating current of 20 to 60 mA. Up until March 5th at 10:30, "Ifan.50m" averaged too low of a current, and so the data was removed. Between March 18th 13:45 and 19th 09:50, "Ifan.2m.bao" had a low fan current and eventually needed to be replaced, the data was removed <<https://wiki.ucar.edu/display/cablisfs/2015/03/19/BAO+site+visit>>. Between April 23rd 13:15 and April 28th 11:50, the current for "Ifan.300m" read too low, and so that data was removed <<https://wiki.ucar.edu/display/cablisfs/2015/04/24/TRH+hiccups>> (see also <<https://wiki.ucar.edu/display/cablisfs/2015/04/24/Even+more+TRH+300m+problems>>). On May 5th between 09:40 and 15:00 there was another instance of erratic Ifan values for the 100 meter data, and that was removed. On May 23rd at 13:20 there was a significant shift in the current of "Ifan.200m" and "Ifan.300m," but aside from removing some spikes, most of the data was maintained <<https://wiki.ucar.edu/display/cablisfs/2015/05/23/bad+200m+and+300m+TRH>>.

There was an instance where the "RH.50m" sensors froze up and could not be restarted through software and so it had to be replaced; only data between 14:15 and 21:20 on April 24th was removed <<https://wiki.ucar.edu/display/cablisfs/2015/04/24/Even+more+TRH+300m+problems>>.

For the 200 and 300 meter sensors, there were a sizable number of spikes/outliers leading up to as well as following the BAO total power outage event <<https://wiki.ucar.edu/display/cablisfs/2015/05/24/Total+BAO+tower+outage>>. The 26th, 27th, and 28th had the bulk of these outliers (as well as several on June 4th and 5th for the 300 meter sensor).

T

The temperature data QC process included all the events from the RH QC processes. In addition, on April 1st between 15:25 and 18:15, data for "T.300m" was removed <<https://wiki.ucar.edu/display/cablisfs/2015/04/01/300m+TRH+restarted+18%3A20+MDT>>.

...more notes are still being added