

16m Licor out since Aug 23

According to <https://wiki.ucar.edu/x/HwCIBg>, the 16m licor is SN1164.

http://www.eol.ucar.edu/isf/projects/BEACHON_SRM/isfs/qcdata/plots/2012/08/23/licor_20120823.png

On Aug 23 18:48:30, the diag initially dropped from a good value of 249 to 118-121.

```
2012 08 23 18:48:30.5894 0.1001 49 249\t0.07072\t12.6021\t0.05373\t415.742\t19.45\t76.2\t\n
2012 08 23 18:48:30.6894 0.1 49 249\t0.07068\t12.6090\t0.05378\t416.812\t19.45\t76.2\t\n
2012 08 23 18:48:30.7894 0.1 49 121\t0.07176\t12.6058\t0.00112\t418.920\t19.45\t76.2\t\n
2012 08 23 18:48:30.8893 0.09994 49 119\t0.06758\t12.5810\t0.00463\t435.376\t19.45\t76.2\t\n
2012 08 23 18:48:30.9893 0.09998 48 118\t0.06661\t12.4256\t0.01945\t-6.373\t19.43\t76.2\t\n
2012 08 23 18:48:31.0896 0.1003 48 118\t0.06405\t11.7233\t0.03659\t56.809\t19.45\t76.2\t\n
2012 08 23 18:48:31.1894 0.09977 49 118\t0.06470\t11.6094\t0.04970\t170.629\t19.45\t76.2\t\n
2012 08 23 18:48:31.2893 0.09994 49 118\t0.06822\t11.0511\t0.06201\t287.164\t19.43\t76.2\t\n
```

After the number of bytes (49 or 48) is the licor data record. The data fields (diag,co2raw,co2,h2oraw,h2o,Tcell,Pcell) are separated by tabs (\t)

A diag of decimal 118 is binary 01110110, where bits 0,3 and 7 are 0.

bits 0-3 are the AGC, automatic gain control. The critical diag bits are 4-7.

See: ftp://ftp.licor.com/perm/env/LI-7500/Manual/LI-7500Manual_V4.pdf, page 3-36.

Bit 4 is Sync:

Sync Flag - If not OK, indicates that the LI-7500 embedded software and the digital signal processor (DSP) receiving the signal from the chopper motor in the sensor head are out of sync. Check cabling.

Bit 5 is the PLL:

PLL - Phase Lock Loop offset, indicates the status of the chopper motor. If not OK, there may be a problem with the chopper motor in the sensor head.

Bit 6 is the detector:

Detector - If not OK, indicates the detector cooler is not maintaining the proper temperature: this will happen at temperatures above 50 °C. Note that this does not always indicate a serious problem; the cooler may simply have not yet reached the target temperature during instrument startup, or it may be out of range due to external environmental conditions. Readings may still be OK. Check cables and wiring.

Bit 7 is the chopper:

Chopper - If not OK, indicates the chopper temperature controller is out of range, hot or cold. As with the Detector indicator above, this may or may not indicate a serious problem. The chopper should be able to temperature control when ambient is between +50 and -25 °C.

Since Aug 23, the diagnostic value has been all over the map, with bits 5,6,7 changing over the day. Here's a snippet of data from Aug 30. Diag=159, binary 10011111, bits 5 and 6 are 0 (not OK), bits 4 and 7 are OK.

```
159\t0.84090\tOverflow\t0.85015\tOverflow\t30.04\t76.3\t\n
159\t0.14794\tOverflow\t-0.15488\tOverflow\t30.04\t76.3\t\n
159\t0.74279\t1034826496\t0.88954\tOverflow\t30.06\t76.3\t\n
```

I think Tcell and Pcell have always looked OK.