Note: This note has an addition for the WCN calculation at the end.

It appears to me that this is how processing is done now for the standard butanol CN counter:

1. FCN comes directly from the CN counter. It is from a mass flow meter, so it must be in slpm.
2. FCNC is calculated in scFlow, from FCNC=FCN$\frac{p_{STP}}{p_{CN}}\frac{T_{CN}}{T_{STP}}$, using the entries in the standard DependTable. (Perhaps this is always changed now?). It is named in the NetCDF files as corrected sample flow, and in the code as vlpm, but it is not clear under what conditions the volume applies. The above equation, if correct, indicates that it is in the CN counter.
3. The CN concentration is then calculated by dividing by FCNC, with further correction by a factor $\frac{p_a}{p_{CN}}\frac{T_{CN}}{T_a}$, amounting to correction of FCNC by the inverse of this factor. The net equation is then equivalent to using the following flow rate F in the calculation:

$$F = FCN\frac{p_{STP}T_{CN}\,P_{CN}T_a}{p_{CN}T_{STP}\,p_aT_{CN}} = \frac{P_{STP}T_a}{T_{STP}p_a}$$

This correctly uses the STP flow rate FCN translated to ambient volumetric flow rate, although the calculation is rather convoluted and confusing, perhaps because Step 3 above is needed saparately for the WCN. However, along the way the value of FCNC is calculated as the volumetric flow rate *in the CN counter*, not in density units applicable to ambient conditions. The result is that, even apart from the coincidence correction, CN counts and CN concentration are not related by the output variable FCNC, and the units of FCNC are not useful for further analysis.

To me, it would seem preferable to calculate FCNC directly from the above equation for F, skipping any dependence on the conditions in the counter, then divide by it in calculating CONCN without further correction. That value should then be FCNC, replacing the quantity now used.

WCN:

The difference for the WCN is that the flow is controlled in terms of volumetric flow under the conditions present in the WCN chamber, with T=45C and pressure PCN usually close to ambient. This is normally a steady 0.3 lpm or 5 cc/s. The flow is not corrected but is output directly as FCNC. The concentration calculation applies the correction ni the first line of Step 3 above but FCNC has not been corrected prior to reaching this point. (The subroutine scWFlow appears to be an unused relic.) This is apparently implemented via a dependTable that shows CONCN dependent directly on FCNC and FCNC not dependent on anything and not calculated via a subroutine. The ambient concentration is then calculated by dividing the counts by the flow FCNC followed by density correction from in-chamber to ambient conditions. The same problem regarding FCNC exists for this measurement because CONCN is output in terms of ambient volume but FCNC is in units of volume under chamber conditions. It would seem preferable to output both in terms of ambient conditions, or else to modify the variable information to indicate that the flow is under conditions different from ambient.