

1. Calibration of LI-COR LI-6262 for co2.ec and h2o.ec:

July 2003 Coefficients:	To= 40.27 + 273.15	ToH= 40.32 + 273.15
(LI-6262, sn IRG3-368)	A= 0.137854	AH= 6.1402 x 10 ⁻³
(Factory Calibration)	B= 1.29799 x 10 ⁻⁵	BH= 2.98828 x 10 ⁻⁶
	C= 4.95653 x 10 ⁻⁹	CH= -2.50046 x 10 ⁻¹¹
	D= -4.96846 x 10 ⁻¹³	
	E= 3.26813 x 10 ⁻¹⁷	T _{ec} = 273.15 + (50/4096)T.ec.mV
	Po= 101.3 kPa	P _{ec} = 59.123 + 0.0152 P.ec.mV
 ("Field" Calibration, every 4 hours)	Offset= CO2 zero (mV)	H.offset = H2O zero (mV)
	S= CO2 span coefficient,	span gas= ≈400 ppm (typical)

note: Offset, H.offset, and S are derived from field calibrations every 4 hours

Water Vapor (h2o.ec) Equation (do first):

$$x = (\text{h2o.ec.mV} - \text{H.offset}) \left(\frac{P_o}{P.ec} \right)^{0.9} \quad (1)$$

$$\text{h2o.ec} = \left(\frac{T}{T_oH} \right) (AHx + BHx^2 + CHx^3) \equiv \text{mmol mol}^{-1} \quad (2)$$

Carbon Dioxide (co2.ec) Equation:

Pressure Broadening Term:

$$\Omega = 1 + \left(\frac{0.5 \cdot \text{h2o.ec}}{1000} \right) \quad (3)$$

then,

$$x = \left(\frac{P_o \cdot S}{P.ec \cdot \Omega} \right) (\text{co2.ec.mV} - \text{Offset}) \quad (4)$$

$$[CO_2]^* = \left(\Omega \frac{T.ec}{T_o} \right) (Ax + Bx^2 + Cx^3 + Dx^4 + Ex^5) \equiv \text{ppm} \quad (5)$$

Final dilution correction:

$$[CO_2]_{\text{final}} = [CO_2]^* \left(1 - \frac{\text{h2o.ec}}{1000} \right)^{-1} \quad (6)$$