Sky Temperature Correction Model

The model to correct the sky temperature measured by the infrared sensor (T_s) is given in terms of the ambient temperature (T_a) by:

$$T_d = (K1 / 100) * (T_a - K2 / 10) + (K3 / 100) * (\text{Exp}\ (K4 / 1000 * T_a))\ \hat{}\ (K5 / 100) + T_{67}$$

where
T_d = Correction value (ºC)
T_a = Ambient temperature (ºC)
K1, K2, K3, K4, K5, K6 and **K7** are the coefficients defined in the ***Device*** section of the ***Setup*** TAB
T_{67} calculation is shown below
Exp(**n**)= *e* (the base of natural logarithms) raised to the power of **n**.
A^b = **a** raised to the power of **b**

The corrected sky temperature (T_{sky}) is given by:

$$T_{sky} = T_s - T_d$$

where
T_{sky} = Corrected Sky Temperature (ºC)
T_s = Infrared Sky Measured Temperature (ºC)
T_d = Correction value (ºC)

Calculation of T_{67} term

If Abs((**K2** / 10 - T_a)) < 1 Then
    T_{67} = *Sgn*(**K6**) * *Sgn*(T_a - **K2** / 10) * *Abs*((**K2** / 10 - T_a))
Else
    T_{67} = **K6** / 10 * *Sgn*(T_a - **K2** / 10) * (*Log*(*Abs*((**K2** / 10 - T_a))) / *Log*(10) + **K7** / 100)
End If

where
Sgn(*x*) = function that returns the sign of *x*
Log(*x*) = function that returns the natural logarithm of *x*
Abs(*x*) = function that returns the absolute value of *x*

Important

In all calculations the values of the temperatures are in degrees Celsius.