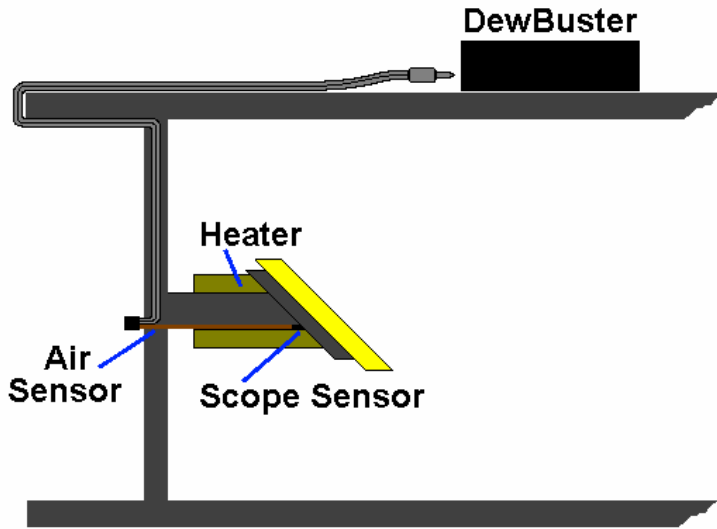
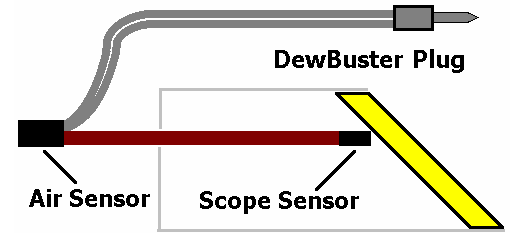


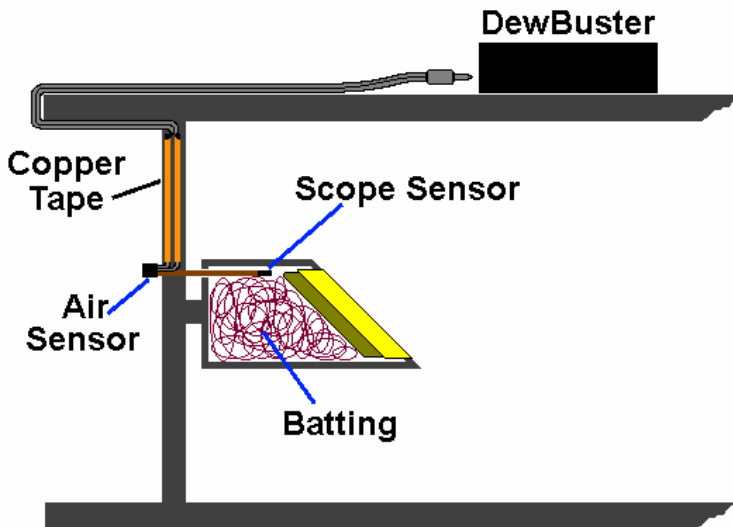
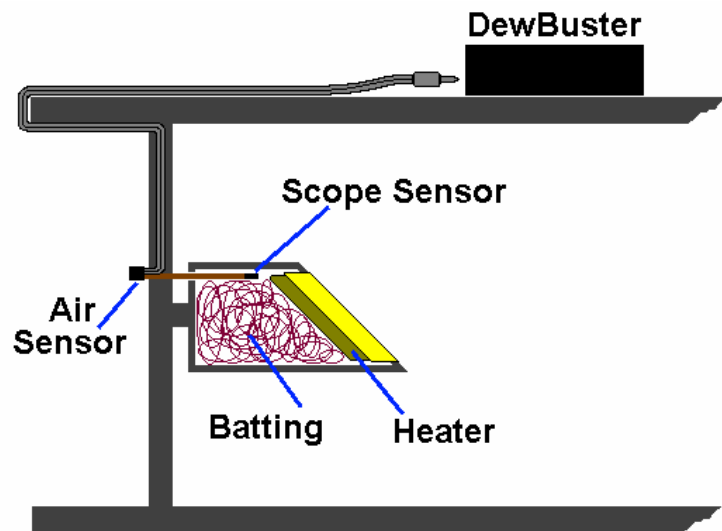
# Newtonian Temperature Sensor

The Newtonian Temperature Sensor combines both air temperature sensor and telescope temperature sensor in a single cable as shown on the right. The **Scope Sensor** measures the mirror temperature and should be positioned as close to the mirror as possible. The **Air Sensor** must be exposed to the outside air and the black band must not touch any metal directly as metal tends to be colder than the air. The brown wire is not temperature sensitive and is very durable so it can be attached to or wrapped around the spider vane or other metal parts as needed to secure it in place and hold the sensors in place.



The diagram on the left shows a typical installation on a telescope with a stalk mounted secondary mirror. The Scope Sensor is sandwiched between the heater and the stalk as close to the mirror as possible. The stalk temperature will be close to the mirror temperature since the mirror is glued to it. The Air Sensor is suspended behind the spider vane where it does not block the light path and is surrounded by air.

The diagram on the right shows a diagonal mounted in a secondary holder. Ideally the Scope Sensor would be glued to the mirror (Silicone RTV is commonly used). However, since the mirror is mounted in a housing, the temperature within the housing will be close to the mirror temperature and thus the temperature sensor can be inserted into the housing so that it is close to the mirror even if it does not touch. The heater will not cause a problem because its temperature is being controlled to the same temperature as the interior of the secondary holder.



The diagram on the left is similar to the one above, except the end user wished to minimize diffraction so they adhered copper tape to the spider vanes. If this is done it is important that the copper does not conduct to any grounded metal parts as this would interfere with the operation of the temperature sensor. The gray cable may be cut as necessary and soldered to the copper tapes as long as polarity is observed.

NOTE: While the Newtonian Temperature Sensor may be used on the primary mirror, heaters are not recommended as fans and a shroud should adequately prevent dew.