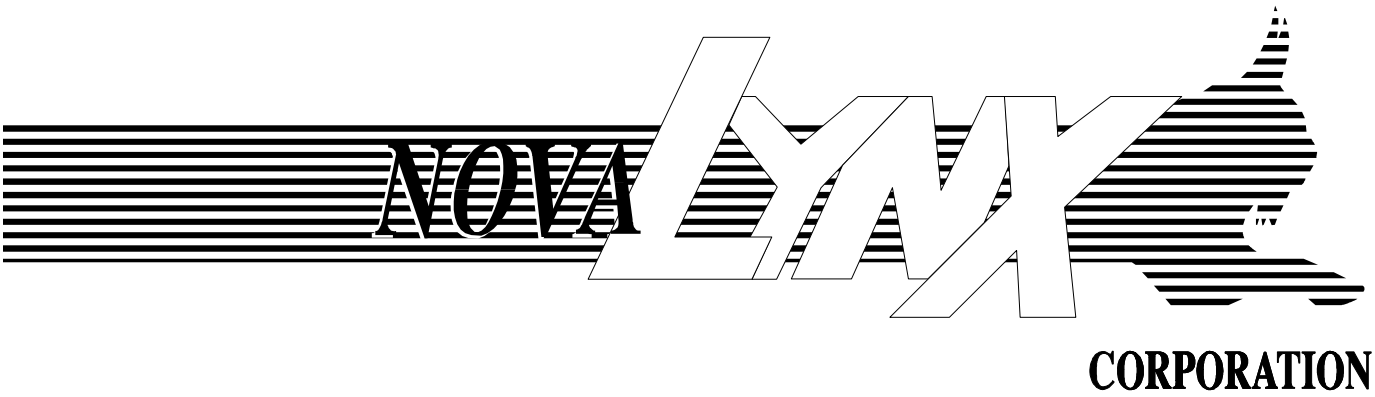
NOVALYNX CORPORATION

MODEL 100-1950
WEATHER STATION

INSTRUCTION MANUAL



Receiving and Unpacking

Carefully unpack all components and compare to packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

Returns

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 A.M. and 4:00 P.M. Pacific Time and request a Return Authorization Number (RA#). Include with the returned equipment, a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage in the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Parcel Post, UPS, or freight service and obtain assistance with the packaging. Write the RA# on the outside of the box.

Warranty

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

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WEATHER STATION
Model 100-1950

1.0 GENERAL DESCRIPTION

NovaLynx Corporation provides a weather station, Model 100 -1950, that displays Wind Speed, Wind Direction, Temperature, Relative Humidity, and Barometric Pressure. The weather displays are analog dials that are enclosed in an attractive wood frame suitable for hanging on a wall.

1.1 Wind Speed and Direction

The Wind Speed and Wind Direction indicators are rectangular electrical meters with needles that deflect with the changing winds. A combination anemometer and vane wind sensor is mounted outdoors at an elevation that will give good exposure to the local winds. The wind sensor is connected to a signal conditioning circuit board located behind the meter case. The anemometer circuit is self generating while the vane circuit requires an external power supply.

1.2 Temperature

The other meters are mechanical devices. The temperature dial is connected to a remotely located temperature sensor through a capillary tube. The temperature measured at the end of the tube is indicated by the meter. The remote temperature sensor may be located to measure either indoor or outdoor air temperatures.

1.3 Relative Humidity

The relative humidity dial is a self-contained meter with the sensing element housed inside the meter. As the relative humidity changes, the meter will respond and its pointer will indicate the new value.

1.4 Barometric Pressure

Similarly, the barometer dial contains the sensing element and indicates changes in the atmospheric pressure. A moveable set-point needle allows the operator to determine whether the barometer has risen or fallen since the last reading has been taken.

2.0 SPECIFICATIONS

Sensors:	
Wind Speed:	AC Generator
Wind Direction:	120 ohm Potentiometer
Temperature:	Vapor Capillary
Relative Humidity:	Bonded Helical Coil
Barometer:	Aneroid Cell
Measured Ranges:	
Wind Speed:	0-25/25-100 mph
Wind Direction:	Nine Cardinal Points
Temperature:	-40 to +140°F
Relative Humidity:	0 to 100 % R.H.
Barometer:	27 to 32 in. Hg & 914 to 1086 mb
Wind Sensor Cable:	5 conductor, 20 AWG
Cable Length:	50 feet (15 m)
Temperature Tube:	6 ft (length not extendable)
Front Panel Finish:	Dark Mahogany
Power requirements:	1 ea "D" cell battery
Display Size:	12" hi x 16.5" w x 3" d (305 x 419 x 76 mm)
Weight / Shipping:	16 lbs / 20 lbs (7 kg / 9 kg)

3.0 INSTALLATION

Installation of the weather station is relatively simple. The wind sensor and temperature sensor are mounted outdoors with the wind sensor placed onto a mast and the temperature sensor clamped onto a wall. The wind sensor has a mounting collar with locking screws that allow it to be installed onto a 1" O.D. mast or pipe. If the sensor is to be located on the roof of a building, the mast should be located on the upwind side. For small structures, the mast should be one and one half times as high as the building upon which it sits. If this is not practical such as is the case for extremely tall buildings, then the mast should be at least thirty feet high above the roof. The nature of the vane requires that it be aligned to North. Alignment marks are provided on the sensor housing. Refer to the sensor manual for specific instructions. Route the wind sensor cable in the most direct

manner to the display and connect the five pin DIN plug into the matching connector located on the side of the display panel.

The temperature sensor should be located on the North side of the structure and under an eave or overhang if possible. The temperature sensor should be protected from exposure to direct sun light and rain to avoid errors in the readings. If a temperature sensor shelter is available, place the sensor inside the shelter. The temperature sensor must be installed by routing the capillary tube from the display to the desired location of the sensor. In many instances, the display will need to be positioned as close as possible to the outside wall and next to the temperature sensor installation point. If possible, route the capillary tube through the nearest window, taking care to avoid bending or deforming the tube in any manner otherwise errors in the reading will result. If a window is not available, drill a hole through the wall to get the temperature sensor to the outside. Fill the hole to prevent air and moisture intrusion. Use a clamp or appropriate hardware to fasten the temperature sensor to the wall or nearest support structure.

For both the wind sensor and the temperature sensor, the cable and capillary tube must be secured to prevent being damaged by high winds. Clamp or tie down the wind sensor cable every two to three feet using either plastic wire ties or other appropriate hardware to suit the installation and the supporting structure. Secure the temperature sensor tube being very careful to avoid crimping, sharp bends, and any deformation of the tube. Please note that the temperature sensor tube contains a fluid and **must not** be cut open for any reason. The temperature sensor tube can not be extended in length due to its design.

Install one each "D" cell battery into the battery holder inside the back of the display. The battery provides power for the wind direction sensor and dial.

Upon completion of the installation of the wind sensor and temperature sensor, hang the display onto the wall. Use the same methods as those employed to hang pictures. Avoid placing the display panel near sources of heat and cold and humidity to eliminate errors in the readings. Place the display at a height that will provide a convenient viewing of the dials. Be sure to leave a small space behind the display to allow air flow for the relative humidity sensor to operate properly.

Periodic checking of the sensors and dials will help ensure good readings from the dials.

4.0 THEORY OF OPERATION

4.1 Temperature

The temperature dial movement is accomplished through the use of a vapor capillary system. As the temperature at the sensing end increases, an increase in the pressure inside the capillary tube occurs. The increase in pressure moves the meter pointer. The

meter has been designed and calibrated to give readings corresponding to the measured temperatures.

4.2 Barometric Pressure

The barometer dial incorporates an aneroid cell as the sensing device. The cell mechanically changes shape as the atmospheric pressure increases and decreases. The aneroid cell is attached to the meter pointer. The dial mechanism moves the pointer in relation to the measured pressure. A manually adjustable pointer is used to track whether the pressure is rising or falling. Whenever a reading is made the pointer is placed over the aneroid cell's pointer. At the next reading the observer can determine if the new reading is greater than or less than the previous reading.

4.3 Relative Humidity

Relative humidity is measured by a coiled sensor with a special coating that is sensitive to moisture. As the relative humidity of the surrounding air changes, the coating of the coiled material either absorbs or releases moisture as it attempts to attain equilibrium with the air. The coiled material expands with increasing moisture and contracts as the moisture decreases. Movement of the coiled material is transmitted to the dial pointer and is calibrated to reflect the relative humidity of the air.

4.4 Wind Speed

Wind speed is sensed by anemometer cups that turn as the wind speed increases above the starting threshold of the sensor. The cups are coupled to an AC generator that generates an AC signal as the cups rotate. The AC signal is transmitted by two wires to the circuit board at the display panel. Electronic components rectify, filter, and scale the signal into a calibrated DC signal to drive the meter. A range switch enables the observer to select the Low or High range in order to obtain the best resolution when making a reading. For wind speeds below twenty-five miles per hour, the best reading is obtained by setting the range switch to the Low position. For wind speeds above twenty-five mph, use the High range switch position. The AC wind speed signal is not polarized electrically and therefore reversal of the wind speed wiring will not harm or change the operation of the signal conditioning circuit.

4.5 Wind Direction

Wind direction is sensed by a moving potentiometer that has been mechanically coupled to the vane. Changes in the wind direction cause the vane to move the potentiometer. A DC signal from the "D" cell battery powers the potentiometer. As the potentiometer moves it creates a changing DC voltage across its resistive element. The changing DC signal is presented at the wiper of the potentiometer and is connected to the signal conditioning circuit at the display panel. The signal conditioning circuit provides an adjustment for "fine

tuning" of the wind direction meter. A three position switch allows the operator to select the wind direction sensor, the calibration mode, or to disconnect the battery. Whenever readings are to be made infrequently, it is recommended that the wind direction circuit be disconnected to increase the life of the battery.

5.0 CALIBRATION

5.1 Wind Speed

Adjust the wind speed circuit by first setting the range switch to the Low range position. Remove the anemometer cups and attach a wind speed spin-up motor to the generator shaft. Rotate the shaft at a constant 300 rpm. For the standard wind sensor, the 300 rpm represents 18.5 mph (8.2 m/s). Adjust the wind speed range potentiometer located on the signal conditioning circuit. If possible check the circuit operation at a higher wind speed by rotating the anemometer shaft at one of the higher rpm values shown, such as 600 rpm.

Please note that the anemometer calibration is fixed and is determined by wind tunnel tests. There is no adjustment as to the mph vs rpm values. Should the anemometer cups become damaged the response of the cups to the wind will be affected and will result in errors in the meter readings. Replace damaged cups as soon as possible. Worn generator bearings can also result in wind speed errors. Replace the anemometer bearings at least annually, and especially in areas that experience constant wind activity.

5.2 Wind Direction

As the vane rotates in a clockwise direction as viewed from above the sensor, the meter will increase its reading from zero to 360 to a maximum indication of East. The full-scale reading will vary as the battery loses its power over time. The full-scale adjustment should be checked before taking readings, especially if readings are taken infrequently. Set the front panel switch to the calibration check position. The sensor should be connected to the meter circuit during this test. Adjust the front panel control until a full-scale reading is obtained. If it is difficult to make the adjustment, it may be an indication that the battery needs to be replaced. Notice that the full-scale deflection of the meter is East, or 90 degrees Azimuth.

5.3 Temperature

The temperature meter and capillary tube do not have any user available adjustments. The only check that can be made is to place the temperature sensor into a controlled or stable temperature bath and compare the reading with that of glass thermometer or another electronic thermometer. For temperature readings that appear to be slightly off during the temperature check, make note of the difference and apply the value to the meter readings whenever a reading is taken. Should the temperature reading appear to be substantially in error the temperature sensor and meter may need replacement. Contact

NovaLynx for assistance.

5.4 Relative Humidity

Relative humidity has an adjustment screw located at the rear of the meter. Obtain the local relative humidity by using a mechanical or an electronic psychrometer. Adjust the screw to obtain the same reading on the humidity dial. Make only minor adjustments to the meter at any one time. Allow the meter to stabilize for a few minutes and then repeat should more adjustment be required. An agreement of three to five percent RH should be acceptable for this type of meter.

5.5 Barometric Pressure

The barometer should be adjusted for the station elevation. Obtain the local barometric pressure by calling the local airport or by listening to local weather forecasts. Adjust the screw at the rear of the barometer to obtain the same reading. Follow the local readings for several days and readjust the meter as required. Make only minor adjustments at any time. Do not use force or turn the screw by a large amount to avoid damaging the barometer.

6.0 MAINTENANCE

Maintenance of the weather station is limited to keeping the display panel clean and free of dust. Use only a damp cloth and water to clean the surfaces of the display panel. The sensors should be free of debris and kept clean. The wind sensor should be checked for worn bearings, damaged cable, and loose hardware. Periodic inspections should be made to help maintain the accuracy of the data. Each time a reading is made, check the wind sensor to ensure that it is rotating freely in the wind and there are no major problems.

7.0 PARTS LIST

MODEL 100-1950
WEATHER STATION

PART NO.	DESCRIPTION	QTY
100-2130	COMBINATION WIND SENSOR	1
100-19501	TEMPERATURE DIAL ASSEMBLY	1
92080000	BAROMETRIC PRESSURE DIAL	1
92080200	HUMIDITY DIAL	1
92080300	WIND SPEED METER	1
92080400	WIND DIRECTION METER	1