MAXIMUM

Summit

Installation & Operation Instructions

for master operating mode

MAXIMUM

Table of Contents

MAXIMUM

Introduction

Thank you for buying Summit. These instructions are designed to take you step by step through the process of installing and using Summit. Carefully following these instructions will help ensure many years of trouble free service from your Summit installation. If you are uneasy about climbing a roof and running wires you should consult a qualified professional. TV antenna, satellite dish, ham radio, home entertainment and alarm system installers are good choices. You should be able to locate some of these professionals in your area by consulting the yellow pages. It is always best to show prospective installers these instructions and obtain quotations from a few different installers in your area.

Preparing for Installation

What you need for the installation

To install Summit you will need the following items.

Components Included with Summit Master

You may want to check off each item as you unpack the instrument.
- ☐ Indicator (readout, brass case)
- ☐ Pluggable terminal strips (one 5 position, one 3 position and, two 2 position)
- ☐ Wind speed sensor (generator)
- ☐ Wind direction sensor (distributor)
- ☐ 2 Rubber boots for wind sensors
- ☐ Temperature sensor with 100' of 2 conductor shielded cable attached
- ☐ 100' 8 conductor shielded cable (for wind sensors)
- ☐ 120 VAC to 24 VDC adapter with 6' of cable
- ☐ Straight stub mast
- ☐ Formed stub mast (lazy Z)
- ☐ Hardware kit which includes:
  - ☐ 2 Stainless steel cotter pins
  - ☐ 10 Brass hex nuts #4-40 (there are 2 extra)
  - ☐ 2 #6 pan head 1" long wood screws
  - ☐ 2 Stainless steel hose clamps. These are used to secure the stub masts to the main support mast. The included clamps are suitable for 1" to 2-1/2" diameter main support masts. If you are using a larger diameter main support mast you will need to obtain larger hose clamps from your local hardware store.

Components Not Included with Summit

Main support mast. See the "Choosing locations for the components" section for details.

Light oil or grease for coating the sensor terminals (e.g. WD-40, vaseline, white lithium grease)

Optional Components for Summit installations

Ice-Free wind sensor set

Summit Remote(s)

Choosing locations for the components

Wind Sensors

The higher the wind sensors are mounted the more unobstructed their exposure to the wind and the more accurate their readings. We recommend that you mount the sensors at least 8 to 10 feet above the highest object on the roof. TV antenna masts and mounts are excellent for this purpose and, are available from Radio Shack and other TV/Electronics stores (check under "Antenna" in your yellow pages). Antenna mounts are available in a wide variety of configurations, some of the more common types are shown in the diagram.
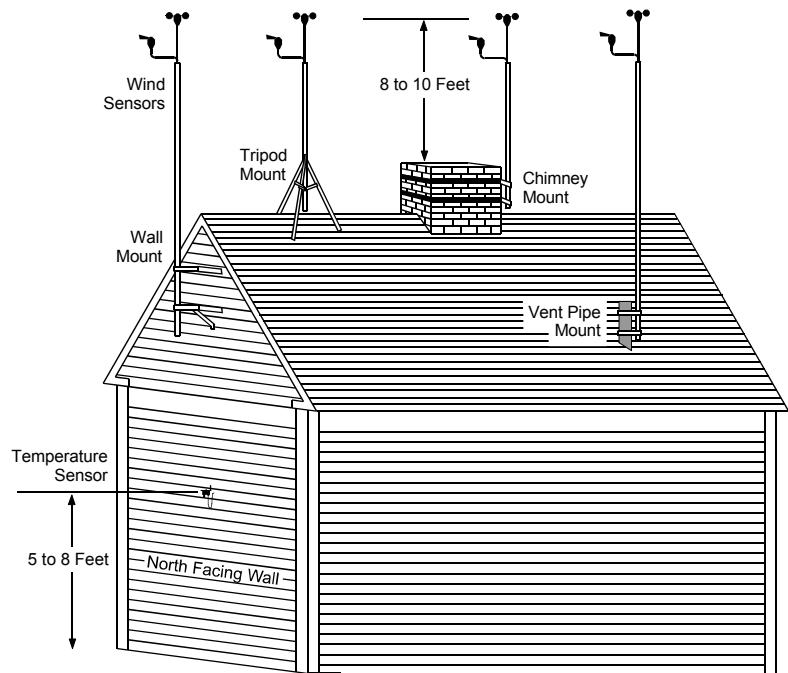
Temperature Sensor

Select a location for the temperature sensor that is protected from direct sunlight and clear of potential physical damage. A North exposure, 5 to 8 feet above the ground is recommended (see diagram). Keep the sensor away from sources of heat such as windows, doors and, dryer vents. Alternatively you can mount the sensor in a properly sited meteorological instrument shelter. If neither of these options works for your installation, a radiation shield may be the solution, please contact us for more information.

Indicator

Summit's large size allows it to be easily read from over 100 feet away when properly installed. For best viewing you should avoid locations where direct sunlight will shine on the instrument. You must also have an AC outlet near the selected location. The AC adapter supplied with Summit has a 6 foot cord. You can extended this distance by splicing on wire to the adapter. The table below gives the maximum distances allowed for various gauges of wire.

Extending the AC Adapter wire		
Wire Gague AWG	Extension wire length in feet	Total wire length (including AC adapters 6 foot cord)
22	5	11
20	10	16
18	15	21
16	20	26
14	35	41

Sensor Wires

Now that you have selected the locations for the components you should measure how much wire you will need for the sensors. The 100 foot cables supplied are usually adequate for most installations. However, you can use up to 500 feet of wire with the sensors.

If you need to, you can extend the supplied wire by splicing on extra cable or, you can buy a longer spool of wire. The wind sensors use 24 AWG 8-conductor shielded cable and the temperature sensor uses 24 AWG 2-conductor shielded cable.

If you splice on additional wire, you should solder the splices and, insulate them well for long term reliability. You should make the splices and prepare the end of the wires like the 100' wire that is supplied before proceeding.
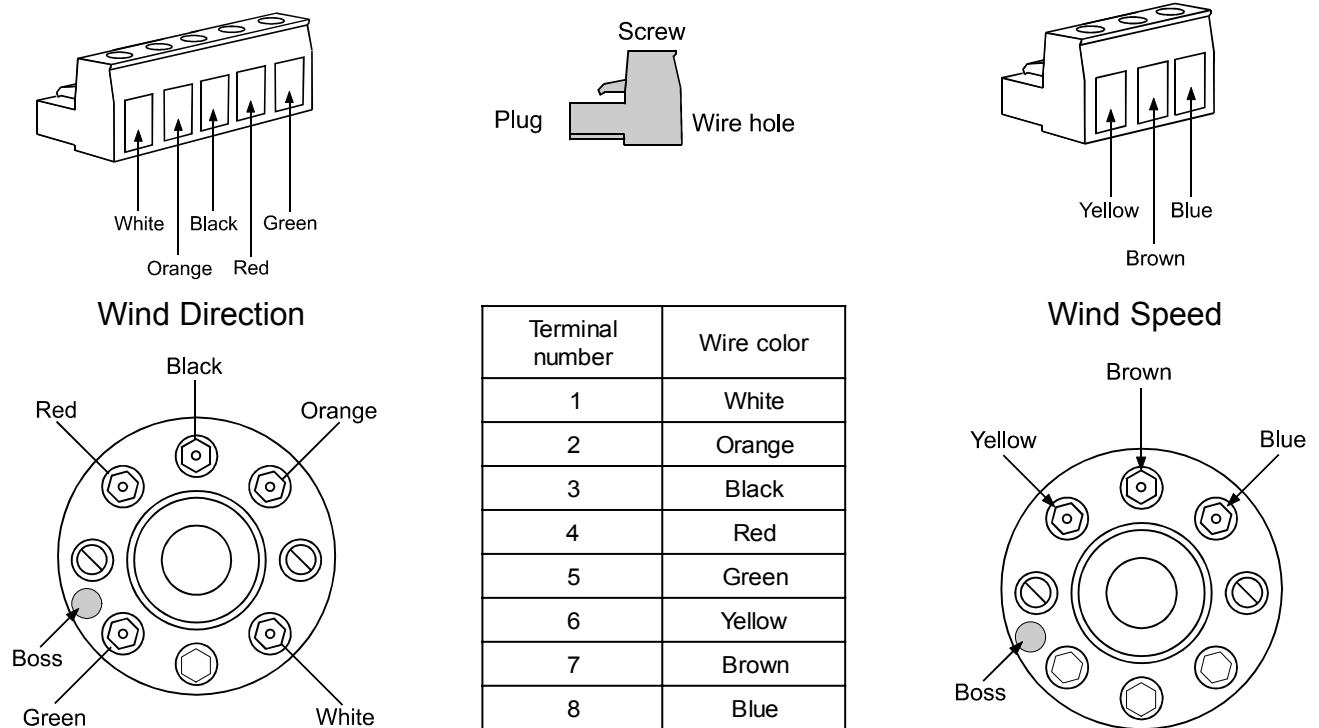
If you are using wire not supplied by Maximum, you should prepare the ends of the wires like the 100' wire that is supplied before proceeding.

Installation

Trial wiring

You should do a trial wiring before running the wires through the walls. Perform the trial wiring in the comfort of your home, garage, etc. This will ensure your confidence in the instruments' operation. If you are extending the length of any of the wires, you should do that before proceeding.

First we will wire the 8 conductor shielded cable for the wind sensors. Connect the wind sensors to the end of the cable that has ring lugs using the brass hex nuts supplied. The 3 and 5 terminal connectors attach to the stripped and tinned end of the cable following the pattern shown in the diagram. The chart below shows the wire color to sensor terminal number assignments. If you are using cable with different wire colors you should write in the colors here and on the label on the back of the instrument.

Screw
Plug   Wire hole

White   Black   Green
Orange   Red

Wind Direction

Yellow   Blue
Brown

Wind Speed

Black
Red   Orange

Boss
Green   White

Brown
Yellow   Blue

Boss

Terminal number	Wire color
1	White
2	Orange
3	Black
4	Red
5	Green
6	Yellow
7	Brown
8	Blue

Attach a 2 terminal connector to the temperature sensors 2-conductor cable. The temperature sensor wires are not polarity sensitive.

Connect a 2 terminal connector to the AC adapters 2-conductor cable. The adapter is polarity sensitive so be sure to connect the wires as shown in the diagram.

White Stripe
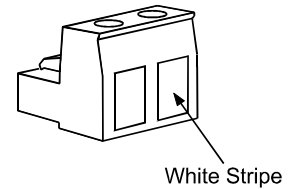
Configuration and Testing

We're now ready to configure the units of measurement and test the system. First, the units of measurement jumpers need to be set. There are six standard PC type jumpers like you find on the circuit boards in a PC. When the jumper cap is mounted on the jumper pins, the jumper is closed, if the cap is not mounted on the pins, the jumper is open (see diagram). The first four jumpers control the units of measurement for wind speed, the fifth jumper sets the units of measurement for temperature and, the sixth jumper sets master or remote operating mode. Summit is shipped with the jumpers set for: Speed = MPH, Temperature = °F and Mode = Master (see diagram). The following table shows all of the valid jumper settings. If you want to use other units of measurement then you must change the jumper settings using the table and diagrams.

Jumper cap

Jumper pins

MPH, °F, Master

Indicator
Rear View

Jumper Settings						
C = Closed, O = Open, X = Don't Care						
Jumper #	1	2	3	4	5	6
MPH	C	O	O	O	X	X
Knots	O	C	O	O	X	X
km/h	O	O	C	O	X	X
m/s	O	O	O	C	X	X
Beaufort	O	O	O	O	X	X
Fahrenheit	X	X	X	X	C	X
Celcius	X	X	X	X	O	X
Master	X	X	X	X	X	C
Remote	X	X	X	X	X	O

1A

24Vdc   Fuse   CR2032 Battery   Ice-Free WD   Wind Direction   Wind Speed   Temperature Select Set   Link

1...6

Knots, °C, Remote

Now it's time to plug the terminal strips into the indicator. Note that there is a plug already installed in the space for the optional ice-free wind direction sensor, don't remove this plug unless you are using the optional ice-free wind sensor set (see separate ice-free sensor instructions). To plug in a terminal, position it with the screw heads oriented toward the middle of the indicator and press into place firmly. The connectors will snap into place when inserted correctly. Go ahead and plug the terminals into the appropriate positions on the indicator (see diagram) The AC adapter connects to the position labeled 24Vdc, **do not plug the AC adapter into a 110VAC outlet yet**.

Before we power up the instrument you need to understand the boot sequence.

When Summit is powered up it first lights up all the LED's for 3 seconds.

Next Summit turns off all the LED's for 2 seconds.

During this time Summit is reading the jumper settings and doing it's POST (Power On Self Test).

The POST codes are now shown on the speed and temperature digits for 6 seconds.

The wind speed 10's digit shows whether the instrument is in master or remote mode, 0 = Remote and 1 = Master.

The wind speed 1's digit shows the type of remote, if the instrument is a remote, 0 = Normal remote, 1 = High remote, 2 = Low remote, 4 = Chill remote.

The temperature 100's digit shows the wind sensor type, 0 = Ice Free, 1 = Standard.

The temperature 10's digit indicates the wind speed units of measurement, 7 = m/s, E = km/h, L = Knots, P = MPH and, Blank = Beaufort.

The temperature 1's digit shows the temperature units of measurement, 0 = °F, 1 = °C

Finally Summit starts a ten second countdown for start of normal operation. The wind speed digits count from 0 to 9 and, the temperature digits move towards the current reading, during this period.

Now plug the AC adapter into a 110VAC outlet. Check the POST codes to make sure you have installed all jumpers correctly. Once the instrument has completed the boot sequence, the temperature digits should be showing the current temperature at the sensor. Next spin the cups of the wind speed sensor and see that a wind speed reading is shown. Finally, turn the wind direction vane and verify that the wind direction lights change (Note - the wind direction reading only updates once per second. If you turn the vane rapidly some LED's will not light.). This completes the testing, unplug the AC adapter form the 110VAC outlet and, disconnect the wires from the sensors and terminal connectors.

Final installation

The indicator hangs on the wall from the two hanger holes on the back. The holes will accept #10 or #8 screws and are located on 16 inch centers for easy mounting (see diagram). Depending on the wall material you may need to use wall anchors, molly bolts, etc. Install the indicator mounting screws now.

Make a hole in the wall behind the Indicator through which all wires will be fed. **CAUTION: DO NOT MOUNT THE INDICATOR WITH ANY WIRES UNDER ITS LIP BECAUSE OF SHORT CIRCUIT HAZARD.**

Feed the AC Adapters' cord from the AC outlet, through the wall to the Indicator.

Run the 8 conductor cable between the mounting location for the wind sensors and the back of the Indicator (through the hole in the wall).
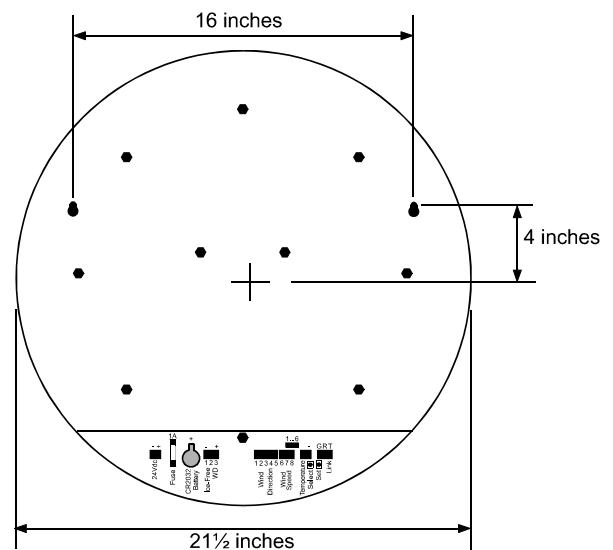
Mount the temperature sensor assembly with the supplied #6 wood screws as shown.

Run the cable attached to the temperature sensor from the sensors mounting location to the back of the Indicator.

Form a drip loop with the wire that extends at least 8 inches below the exit from the sensor and at least 8 inches below the point of entry in the building, as shown. Anchor any exposed wire with insulated staples or cable clips being careful to avoid puncturing the insulation.

#6 Screws

8 inches

Mount the generator (wind speed sensor) to the straight stub mast and secure it with a cotter pin. Mount the distributor (wind direction sensor) on the formed stub mast ("formed" in a lazy z shape) so that the #3 terminal lies over the horizontal mast arm as shown (see diagram). Secure the distributor to the mast with a cotter pin.

Slip the wind senor wires through the rubber boots. Connect the wires to sensors like you did during the trial wiring. When completed double check your wiring for correct number to color match up, that the nuts are secure and, that no lugs touch one another.

Terminal #3

Align to North

Coat the brass terminals on both sensors with a light oil or grease (e.g. WD-40, vaseline, etc.). Slide the boots onto the masts and up around the sensor bodies.

Base Mast

Hose Clamps

Proceed to secure the stub masts with the sensors to the base mast using the hose clamps. Before final tightening, turn the formed mast arm (with the distributor/vane assembly) to point true north (see diagram). (If you use a magnetic compass, remember to allow for the magnetic declination for your location. This information is available from your local airport.)

Secure the wires to the masts using cable ties or electrical tape so that it does not whip in the wind.

At the indicator, connect the cables to the terminal connectors. Plug the terminal connectors into the indicator. Hang the indicator on the mounting screws.

Plug the AC Adaptor into the 110 VAC outlet. Verify that the POST codes are correct. This completes the installation of Summit.
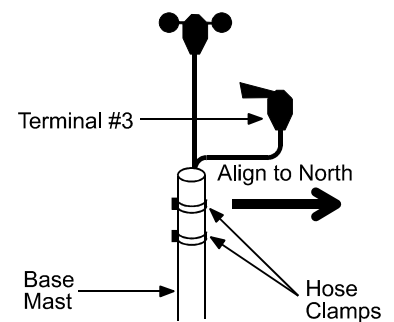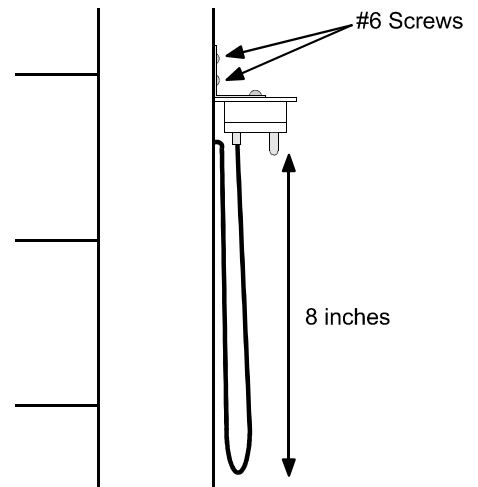
Appendix A Specifications

Measurement Range and Resolution

Wind speed	0 to 255 MPH	1 MPH
Wind direction	16 compass points	22.5°
Temperature	-40 to 122 °F	1°F

Accuracy

Wind speed	±2.1 MPH
Wind direction	±11.25°
Temperature	0 to 100 °F ±2.0°F -40 to 122 °F ±2.5°F

Power Requirement

24 to 28 VDC @ < 1Amp

Appendix B Troubleshooting

If you have a problem with Summit, please try the following troubleshooting instructions to narrow down the source of the problem, before contacting us. If you need further assistance you may contact us at:

Maximum Inc.
30 Samuel Barnet Blvd.
New Bedford, MA 02745
(508) 995-2200
Fax (800) 989-2580
e-mail - service.maximum@imtra.com
Also check our web site for late breaking information - www.maximum-inc.com

Symptom	Things to check
LED's do not light.	AC Adapter wiring. AC adapter power, 24 to 28 VDC. AC outlet power, 110 to 120VAC. Indicator fuse.
Fuses keep blowing.	AC Adapter wiring.
No wind speed reading.	Wind speed sensor wiring. *Field Test:* Disconnect the wind speed sensor wires from the terminal connector. Using a jumper wire (a paper clip will do), momentarily make a short circuit between terminals #7 and 8, a few times per second. You should get a reading on the wind speed display. If

	it does read this new value then the problem is either a problem in the wires or a defective sensor.
No wind direction reading.	Wind direction sensor wiring. *Field Test:* Unplug the AC adapter from the AC outlet. Disconnect the wind direction sensor wires from the terminal connector. Connect a jumper wire (a paper clip will do), between terminals #1 and 3. Plug the AC adpater back into the AC outlet. Watch the POST code to make sure it indicates standard wind sensors (temperature 100's digit = 1). If the POST code shows 0 (ice-free sensors) then the problem is in the indicator. If the POST code is correct, wait for the instrument to finish the boot sequence. You should get a reading of NNE on the wind direction display. Next test the other directions by moving the jumper wire to the following positions. 2 to 3 = ESE, 4 to 3 = SSW, 5 to 3 = WNW. If it does read these wind directions then the problem is either in the wires or a defective sensor.
Temperature always reads -40°.	Temperature Sensor wires *Field Test:* Disconnect the temperature sensor wires from the terminal connector. Connect a jumper wire (a paper clip will do) to the terminal connector. Plug the terminal connector into the indicator. The temperature should slowly climb to 122°F (50°C). If it does read this new value then the problem is either an open circuit in the wires or a defective sensor.
Temperature always reads 122°F (50°C).	Temperature Sensor wires *Field Test:* Disconnect the temperature sensor wires from the terminal connector. The temperature should slowly drop to -40°. If it does read this new value then the problem is either a short circuit in the wires or a defective sensor.

The m/s units for wind speed won't work even though the jumpers are set correctly.

Make sure that there is a terminal connector installed in the ice-free direction terminals and, that the connector has a jumper wire connecting terminals #1 and 2.

Appendix C Common Questions and Answers

Q   What are the two push button switches for?

A   The two push button switches are only used with remotes that calculate Highs, Lows or Averages. They are used on the remotes for setting the time of the built-in clock. See the seperate remote instructions for details.

Appendix D FCC Notice

Information to the Summit User

Warning: Changes or modification to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designated to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

•	Reorient or relocate the receiving antenna.

•	Increase the separation between the equipment and the receiver.

•	Connect the equipment into an outlet on a circuit different than from that which the receiver is connected.

•	Consult the dealer or an experienced radio TV technician for help.

Shielded cables must be used with this unit to ensure compliance with the Class B FCC limits.

If necessary the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: HOW TO IDENTIFY AND RESOLVE RADIO TV INTERFERENCE PROBLEMS. This booklet is available from the U.S. Government Printing Office, Washington DC 20402 Stock No. 004000003454.

Appendix E Warranty

Five year limited warranty

Maximum instruments are supported by many years of experience in building weather instrumentation to the most exacting standards of construction. Instrument sensors and details are consistently the highest quality so that their accuracy can meet the needs of commercial users. This allows us to offer the following warranty:

Maximum Inc. of 30 Samuel Barnet Blvd., New Bedford, MA. warrants its Weather instruments to be free from defects in the material and workmanship for five years from date of original purchase. This warranty does not cover damages due to improper installation or use, lightning, or damage attributed to unauthorized service. Nor does this warranty apply if any seal on any instrument is broken. Any defective weather instrument which is returned for service will be repaired, or replaced, at the option of Maximum, free of charge. The forgoing is in lieu of all express warranties.

Procedure

The instrument must be returned, postage prepaid, to Maximum and should be accompanied by a return address and a brief statement of the malfunction. Services under this warranty will be available at any time of the year and will be completed within three weeks after the instrument is returned. The return of the warranty card is not a condition of warranty coverage, but may serve as evidence of your date of purchase.

Limits of Liability

The foregoing shall constitute the sole and exclusive remedy of any owner of a Maximum weather instrument for the breach of warranty including the implied warranties of merchantability and fitness. Implied warranties with the respect to Maximum weather instruments, which shall exist only if imposed by law, shall be limited in duration to the duration of this warranty. IN NO EVENT SHALL MAXIMUM INC. BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE INSTALLATION OR USE OF ANY INSTRUMENT. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you. Maximum does not make or assume or authorize any other person to make or assume for it any other warranty or liability in connection with its weather instruments. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Owners Notes