RX Antenna Monitor

Model 4046E Series

Operation Manual

NOTE

This Manual is Preliminary and subject to change.

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Safety Precautions

The following are general safety precautions that are not necessarily related to any specific part or procedure, and do not necessarily appear elsewhere in this publication. These precautions must be thoroughly understood and applied to all phases of operation and maintenance.

WARNING

Keep Away From Live Circuits

Operating Personnel must at all times observe general safety precautions. Do not replace components or make adjustments to the inside of the test equipment with the high voltage supply turned on. To avoid casualties, always remove power.

WARNING

Shock Hazard

Do not attempt to remove the RF transmission line while RF power is present.

WARNING

Do Not Service Or Adjust Alone

Under no circumstances should any person reach into an enclosure for the purpose of service or adjustment of equipment except in the presence of someone who is capable of rendering aid.

WARNING

Safety Earth Ground

An uninterruptible earth safety ground must be supplied from the main power source to test instruments. Grounding one conductor of a two-conductor power cable is not sufficient protection. Serious injury or death can occur if this grounding is not properly supplied.

WARNING

Resuscitation

Personnel working with or near high voltages should be familiar with modern methods of resuscitation.

WARNING

Remove Power

Observe general safety precautions. Do not open the instrument with the power applied.

Safety Symbols

WARNING

Warning notes call attention to a procedure, which if not correctly performed, could result in personal injury.

CAUTION

Caution notes call attention to a procedure, which if not correctly performed, could result in damage to the instrument.

The caution symbol appears on the equipment indicating there is important information in the instruction manual regarding that particular area.

NOTE

Calls attention to supplemental information.

Warning Statements

The following safety warnings appear in the text where there is danger to operating and maintenance personnel and are repeated here for emphasis.

WARNING

Leaking RF energy is a potential health hazard. Never attempt to connect or disconnect equipment from the transmission line while RF power is being applied. Severe burns, electrical shock, or death can occur.

Refer to page 7.

Safety Statements

USAGE

ANY USE OF THIS INSTRUMENT IN A MANNER NOT SPECIFIED BY THE MANUFACTURER MAY IMPAIR THE INSTRUMENT'S SAFETY PROTECTION.

USO

EL USO DE ESTE INSTRUMENTO DE MANERA NO ESPECIFICADA POR EL FABRICANTE, PUEDE ANULAR LA PROTECCIÓN DE SEGURIDAD DEL INSTRUMENTO.

BENUTZUNG

WIRD DAS GERÄT AUF ANDERE WEISE VERWENDET ALS VOM HERSTELLER BESCHRIEBEN, KANN DIE GERÄTESICHERHEIT BEEINTRÄCHTIGT WERDEN.

UTILISATION

TOUTE UTILISATION DE CET INSTRUMENT QUI N'EST PAS EXPLICITEMENT PRÉVUE PAR LE FABRICANT PEUT ENDOMMAGER LE DISPOSITIF DE PROTECTION DE L'INSTRUMENT.

IMPIEGO

QUALORA QUESTO STRUMENTO VENISSE UTILIZZATO IN MODO DIVERSO DA COME SPECIFICATO DAL PRODUTTORE LA PROZIONE DI SICUREZZA POTREBBE VENIRNE COMPROMESSA.

SERVICE

SERVICING INSTRUCTIONS ARE FOR USE BY SERVICE - TRAINED PERSONNEL ONLY. TO AVOID DANGEROUS ELECTRIC SHOCK, DO NOT PERFORM ANY SERVICING UNLESS QUALIFIED TO DO SO.

SERVICIO

LAS INSTRUCCIONES DE SERVICIO SON PARA USO EXCLUSIVO DEL PERSONAL DE SERVICIO CAPACITADO. PARA EVITAR EL PELIGRO DE DESCARGAS ELÉCTRICAS, NO REALICE NINGÚN SERVICIO A MENOS QUE ESTÉ CAPACITADO PARA HACERIO.

WARTUNG

ANWEISUNGEN FÜR DIE WARTUNG DES GERÄTES GELTEN NUR FÜR GESCHULTES FACHPERSONAL. ZUR VERMEIDUNG GEFÄHRLICHE, ELEKTRISCHE SCHOCKS, SIND WARTUNGSARBEITEN AUSSCHLIEßLICH VON QUALIFIZIERTEM SERVICEPERSONAL DURCHZUFÜHREN.

ENTRENTIEN

L'EMPLOI DES INSTRUCTIONS D'ENTRETIEN DOIT ÊTRE RÉSERVÉ AU PERSONNEL FORMÉ AUX OPÉRATIONS D'ENTRETIEN. POUR PRÉVENIR UN CHOC ÉLECTRIQUE DANGEREUX, NE PAS EFFECTUER D'ENTRETIEN SI L'ON N'A PAS ÉTÉ QUALIFIÉ POUR CE FAIRE.

ASSISTENZA TECNICA

LE ISTRUZIONI RELATIVE ALL'ASSISTENZA SONO PREVISTE ESCLUSIVAMENTE PER IL PERSONALE OPPORTUNAMENTE ADDESTRATO. PER EVITARE PERICOLOSE SCOSSE ELETTRICHE NON EFFETTUARRE ALCUNA RIPARAZIONE A MENO CHE QUALIFICATI A FARLA.

About This Manual

This manual covers the operating and maintenance instructions for the following models:

4046E Series - RX Antenna Monitor

Changes to this Manual

We have made every effort to ensure that this manual is accurate. If you discover any errors or have suggestions for improving this manual, please send your comments to our Technical Support Center - See page 27 for details. This manual may be periodically updated. When inquiring about updates to this manual refer to the part number and revision on the title page.

Chapter Layout

Introduction — This section provides a general description of the 4046E Series RX Antenna Monitor.

Installation — The installation section provides an example connection diagram and steps required for a typical installation.

Maintenance — This section provides general information on recovering the sensor as well as contact information for the Bird Service Center and Technical Support Center.

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Chapter 1 Introduction

Purpose and Function

The 4046E RX Antenna Line Monitor accurately determines antenna health by measuring return loss. Installed between the receive antenna and base station radio, the monitor uses an injected test signal to assess antenna condition and ensure continuous system reliability.

Figure 1 Bird 4046E RX Antenna Line Monitor

The 4046E is designed to transfer data over an Ethernet connection and requires an external power supply.

The 4046E facilitates multiple solutions through Key Functionalities:

- **Antenna Impedance Match Measurement:** Determines antenna health by analyzing return loss
- **Interference Detection:** Identifies potentially harmful interference signals exceeding user-defined thresholds
- **Web Interface:** Provides easy to use visual updates and configurations
- **SNMP Interface:** Enables remote monitoring and management via network servers, with SNMP V2C/V3 support included

Figure 2 Bird 4046E Features

Features	
RF Input (Antenna)	N-Type (female) connector (male also available).
RF Output (Radio)	N-Type (male) connector (female also available).
DC Power Connector	DC input connector for the included 15 VDC power supply.
Ethernet Port	RJ-45 connector used to interface with the Sensor's Web UI and provide the measurement interface.
Reset Button	This reset button is a hole under the Ethernet jack. • When short pressed (less than 5 seconds), the button will cause the IP address to be reset to the default of 192.168.3.200. • When long pressed (more than 5 seconds), all of the 4046E settings are reset to the factory defaults.
Status LED	Solid green: Power applied during boot-up. Blue flashing: Normal operation. Red: Reset button pressed and released.

Sensor Operation

The 4046E RX Antenna Line Monitor is a unique sensor that can measure the return loss and interference signals present in an RF system by scanning up to 255 individual frequency points, as shown in Figure 3.

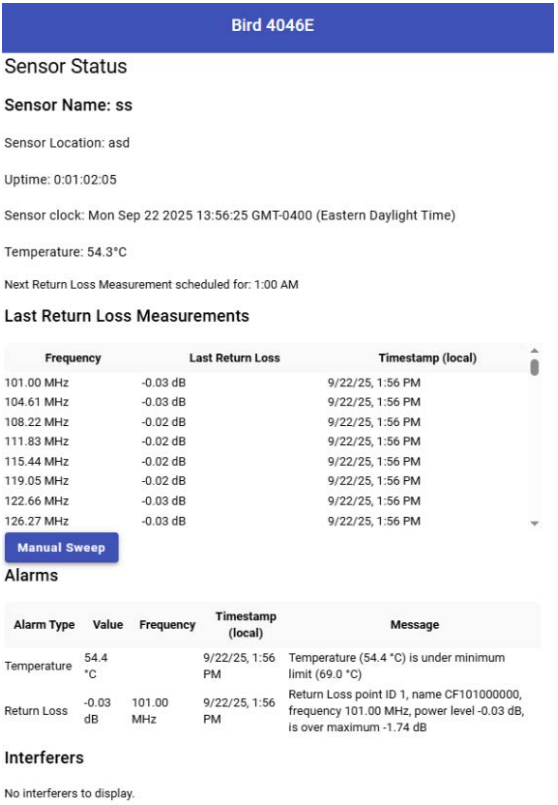
The sensor can be set up to provide alarms for return loss and other data points. See "RF Measurement Alarm Settings" on page 10.

Ethernet Measurement Interface

The 4046E sensor displays measurement information on a Web UI. Using a web browser, enter the Ethernet IP address for the 4046E to display the web page.

The Sensor Status Screen displays the Last Return Loss Measurements, Alarms, Interferers, Sensor Uptime, and Temperature. See Figure 3.

Figure 3 Web UI, Sensor Status Screen



Ethernet IP Address

Each 4046E leaves the factory with the same default IP address.

Default IP Address: **192.168.3.200**

To change the IP address, see "LAN Connection" on page 5.

Password Protection

The 4046E configuration settings are password protected. The sensor may not be configured without entering a password. The Web UI provides a user management menu; several users with individual passwords may be added.

The default username is **admin.**

The default admin password is the **Sensor's Serial Number.** If the default password is used, a prompt will appear at login to change to a unique password.

Bird recommends maintaining a secure record of all unique usernames and passwords, particularly if multiple users require access to the 4046E. Use the space below to note this information if desired.

Username: _____

Password: _____

To change the password or add additional users, see "Manage Users" on page 23.

Chapter 2 Sensor Installation

The Bird 4046E Series Receive Side Sensors are designed to be used for continuous power monitoring in multiple Land Mobile Radio (LMR) systems. Using the Ethernet port on the sensor, it can be connected either directly to a PC or to a network router/switch to join a LAN.

Since the 4046E is shipped with a static IP address, before more than one unit can be added to a LAN, the IP address must be changed to a unique static IP address or set to DHCP.

LAN Connection

A LAN connection is used to allow multiple sensors to be deployed then monitored via a PC or SNMP management software.

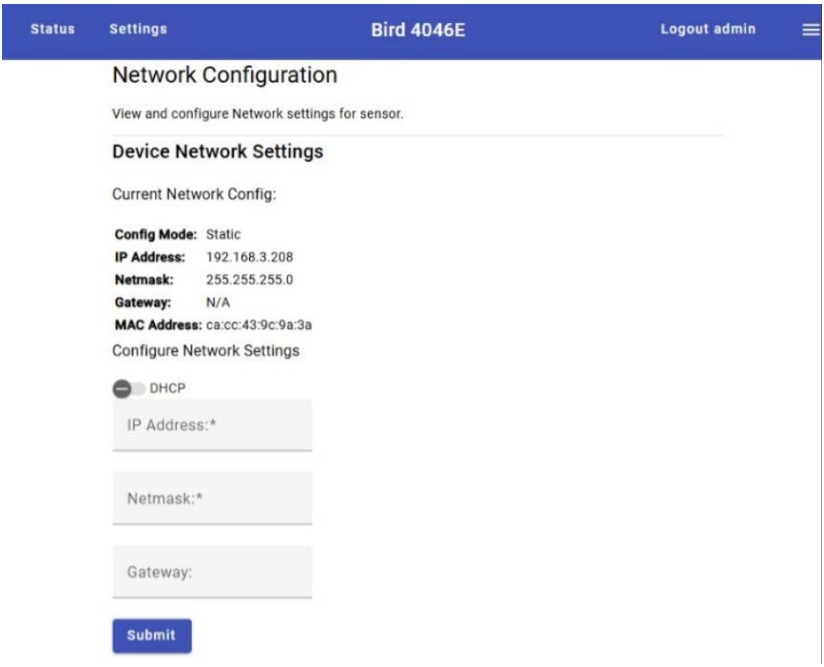
The 4046E sensor's IP address should be set to a unique static IP address or set to DHCP, so the IP address can be assigned when the sensor is connected to the network.

NOTE

The 4046E's default IP address from the factory is 192.168.3.200.
To reset to default, briefly press the button under the Ethernet port.

1. Connect a power cable to the 4046E RX Antenna Monitor.
   a. Connect your laptop's network port to the LAN connector on the 4046E using a standard Ethernet cable.
   b. Ensure that your laptop's IP address is compatible with the default address of the 4046E. This may require changes to be made to the Ethernet adapter address on your laptop.
   Set laptop's IP address to "192.168.3.1" and a subnet mask of "255.255.255.0".
2. Change sensor's IP Address:
   c. Launch your web browser on the laptop.
   d. In your web browser's address box, type in the 4046E's IP address (192.168.3.200) and press the ENTER key. The web page interface to the unit should appear in your laptop's browser window.
   e. Click Login in the top right of the display.
   f. Enter the username and password. The default username is "admin" and the default password is the sensor's serial number (found on the sensor and in the Menu > About screen).
   g. Click the  menu in the top right of the display.
   h. Select Network and NTP Settings.

Figure 4 Update sensor's IP Address



i. Select Static or DHCP.

NOTE

The DHCP slider will change color when selected to indicate that DHCP is active.

- If Static is selected, enter a unique IP address, Netmask, and Gateway, then go to the next step.
- If DHCP is selected, go to the next step.

j. Click Submit.

3. Launch your web browser on a PC connected to the same network as the 4046E.
4. Enter the 4046E's newly assigned IP address in the web browser's address box.
5. If required, log in again with a username and password. See page 5 for default login information.
6. Now the 4046E is ready for use over LAN. Connect the sensor to an RF delivery system. See "RF Connections" on page 7.
7. See "Sensor Operation" on page 8 for descriptions of the sensor's User Interface.

RF Connections

WARNING

Leaking RF energy is a potential health hazard. Never attempt to connect or disconnect equipment from the transmission line while RF power is being applied. Severe burns, electrical shock, or death can occur.

1. Disable RF power for transmission lines to be disconnected.
2. Connect the antenna's RF cable to the 4046E RF input connector.
3. Connect the 4046E's RF output connector to the receiver, repeater, etc. that the antenna was connected to.
4. Repeat steps 1 through 3 for any additional 4046E Sensors.

RF Alarm Settings and Thresholds can be set for each Sensor, see "RF Measurement Alarm Settings" on page 10.

CAUTION

INTENDED USE: This device is intended for use only with a dedicated receive antenna. It must not be used in systems where the transmit and receive functions share the same antenna, even if operating on different frequencies. Doing so may result in equipment damage or degraded performance.

CAUTION

TOWER-TOP AMPLIFIERS (TTAs): The 4046E is designed for direct connection to a dedicated receive antenna and is not intended for use in systems employing Tower-Top Amplifiers (TTAs) or other active receive devices powered over coax.

Chapter 3 Sensor Operation

User Interface

Sensor Status — The Sensor Status page displays the RF measurements made by the 4046E.

NOTE

The following capabilities are password protected.

Settings Menu — The Settings Menu is used for the following capabilities:

- General Settings
- SNMP Settings
- Alarm Settings
- Return Loss Settings
- RSSI Interferer Settings

Configuration Menu — The 4046E allows setting the following community strings: Read, Write, Traps. is used to access the following pages:

- About (Sensor Details)
- Network and NTP Settings
- Firmware Update
- Manage Users
- License and Compliance
- Configuration Backup and Restore
- Change Password
- Reboot Sensor

Sensor Status Screen

The Sensor Status Screen displays the currently configured status, available in both Sweep mode and Measurement Points mode. Data displayed includes:

- Sensor name, location, uptime, clock, and temperature
- Last Return Loss Measurements for sweeps or measurement points
- Triggered alarms
- Present Interferers

Figure 5 Sensor Status Screen, Measurement Points

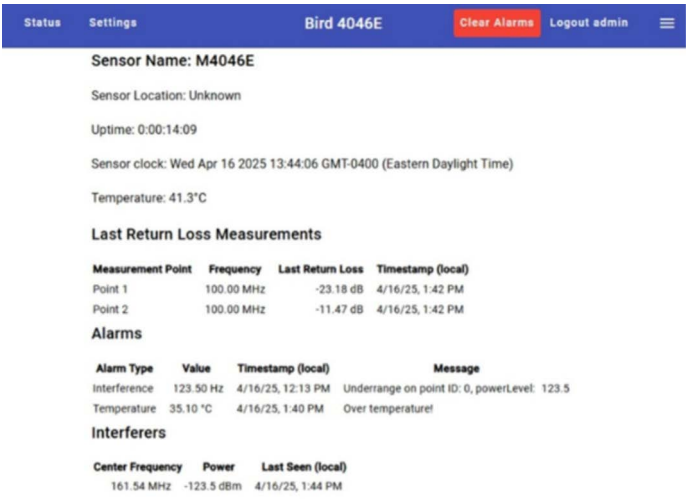
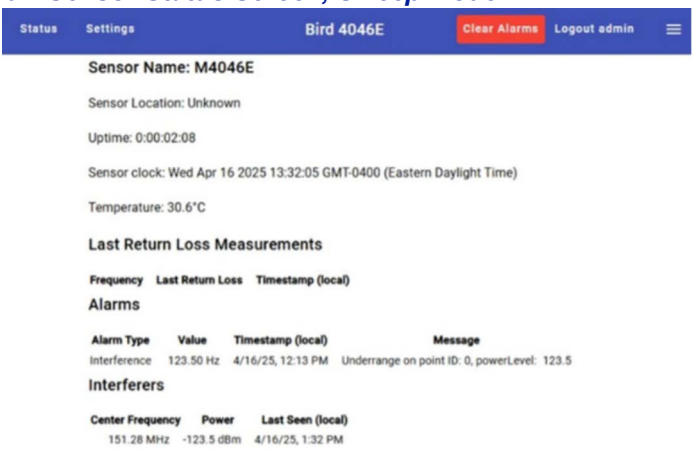


Figure 6 Sensor Status Screen, Sweep Mode



Settings Menu

RF Measurement Alarm Settings

The 4046E sensor can be set to display an alarm and can send SNMP trap messages. Alarms are controlled on the settings page, see Figure 7.

Figure 7 4046E Alarm Settings

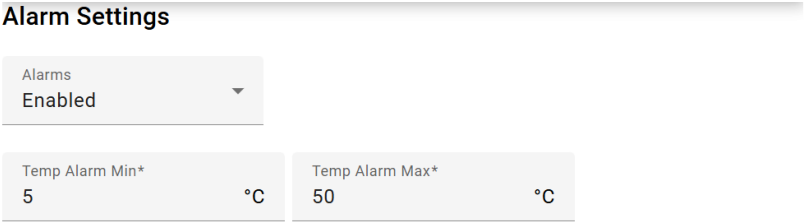
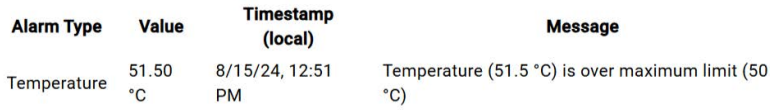


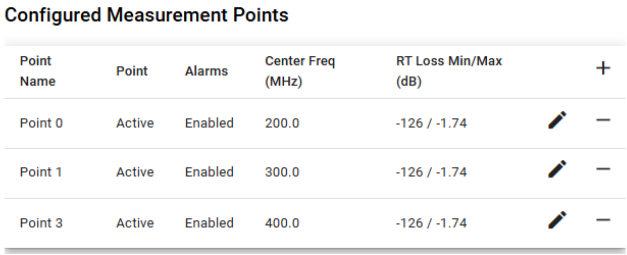
Figure 8 Alarm Display



Points Configuration

The 4046E sensor is capable of scanning up to 255 individual points of frequency for Return Loss Measurement, each of which can be configured using the device's UI.

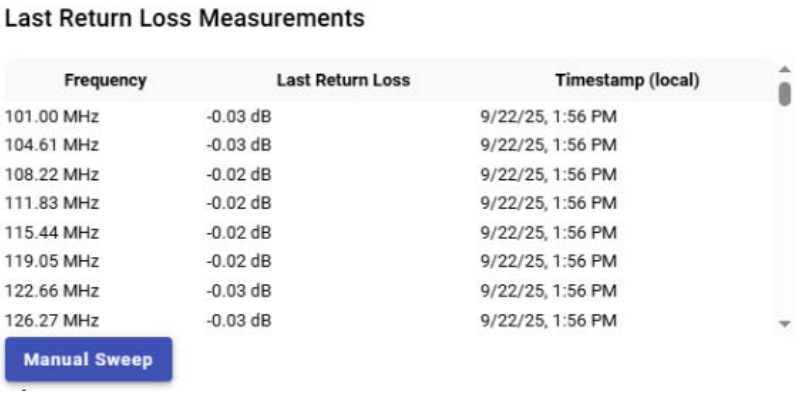
Figure 9 Points Configuration



Manual Sweep

The 4046E sensor is capable of performing sweeps on demand in addition to scheduled ones. Pressing the “Manual Sweep” button on the “Status” and/or “Return Loss” pages while logged in will perform a sweep across the currently configured range or set of points.

Figure 10 Manual Sweep Button



SNMP Configuration

The Simple Network Management Protocol (SNMP) feature is designed to provide reliable Internet notification of an alarm occurrence. SNMP is an Internet standard protocol for managing devices on IP networks. The 4046E is capable of utilizing SNMP versions V2C and V3.

SNMP network management software is required to implement SNMP. It is the customer’s responsibility to ensure the destination computer is running suitable SNMP management software.

Bird provides MIB files for use with the customer’s SNMP management software. These MIB files allow the trap messages to be properly decoded. The MIB files can be downloaded from the product page on the Bird website at www.birdrf.com.

The 4046E supports SNMP GET and SET commands and can be configured to send SNMP Trap messages. All of the 4046E’s SNMP commands can be found in the MIB file.

GET and SET Commands

The SNMP manager can issue a GET request to read settings and power measurements, and the SNMP manager can issue a SET request to change settings.

GETS

The SNMP GET operation is used by the SNMP manager applications to retrieve one or more values from the 4046E.

The SNMP GET operation is used to query the scalar variables in a MIB. Each variable is identified by its OID. The 4046E will respond with a return value or with an error.

SETS

The SNMP SET operation is used by the SNMP manager to modify settings in the 4046E.

Perform an SNMP SET operation by providing the host name of the 4046E, one or more OIDs along with its instance, and the new value. The 4046E processes the request and assigns the new value to the MIB variable. If an error occurs, the new value is not assigned.

SNMP Sets must be enabled in the UI under SNMP Configuration, see Figure 11 on page 13. If SNMP Sets are disabled, an SNMP set operation will return a “Commit failed” error, the SNMP agent will not be able to send any SET commands, and no settings can be changed from the SNMP Manager.

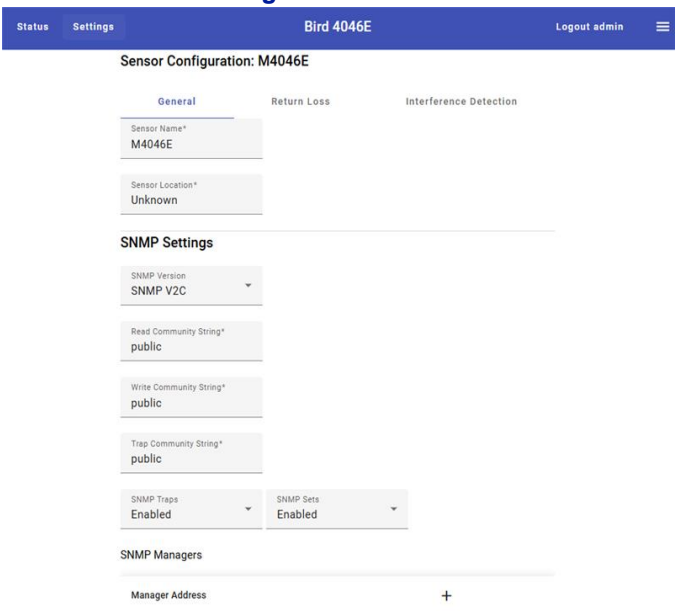
SNMP V2C

The 4046E SNMP settings include Read, Write, and Trap community strings. The strings are like a user ID or password that allows access to the sensor's data and configuration. The community strings default to public, meaning they are open and may be accessed by any SNMP client.

To protect the sensor's data and configuration, the community strings may be changed so only a client with matching strings may access the sensor's data and configuration. The community strings can only be changed using the UI.

The 4046E allows setting the following community strings: **Read**, **Write**, **Traps**.

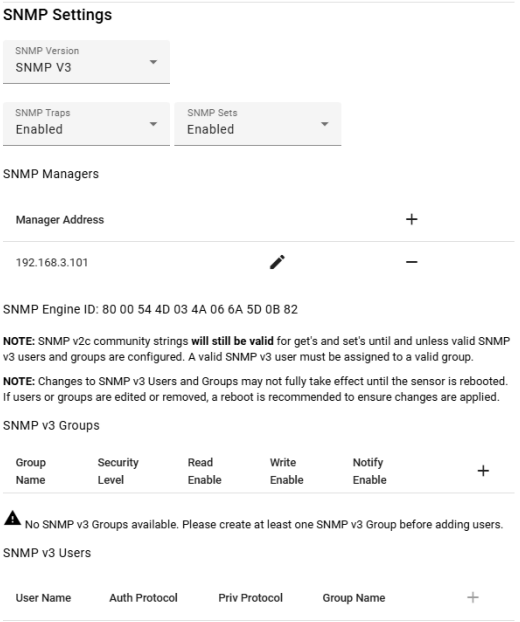
Figure 11 SNMP V2C Configuration



SNMP V3

This version of SNMP allows for groups to be created, each with its own security level and read/write/notify permissions.
In addition, individual users can be created and assigned to groups while retaining their own permissions protocols.

Figure 12 SNMP V3 Configuration



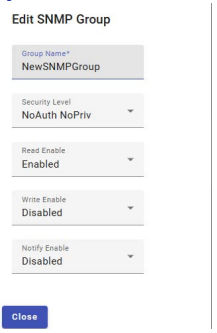
Once a group has been created, it can be edited by clicking the pencil icon. The pop up menu that appears allows for the name to be customized as well as read, write, and notify permissions to be enabled or disabled and the security level to be established:

NoAuth NoPriv = This security level provides no protection. SNMP messages are sent without authentication or encryption, meaning that anyone with access to the network could potentially read or send messages (SNMP set commands) to the SNMP agent.

Auth NoPriv = This security level includes authentication to confirm who sent the message. SNMP v3 uses hashing algorithms such as MD5 or SHA to generate a unique fingerprint of the message. User may set authentication passwords. This fingerprint, sent along with the message, allows the receiver to confirm both the sender's identity and that the message hasn't been altered. Keep in mind, though, that the message itself is not encrypted — anyone who intercepts it can still read its contents.

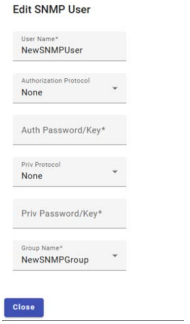
Auth Priv = This level offers both authentication and encryption. Like the Auth NoPriv level, it verifies the sender's identity — but it also secures the message by encrypting its contents. SNMP v3 uses AES and DES protocols to encrypt messages. User may set encryption passwords. As a result, only a recipient with the proper password can access the information.

Figure 13 SNMP V3 Group Edit Menu



After creating a user profile, it can be edited by clicking the pencil icon. The pop up menu that appears allows for the name to be customized, the Authorization protocols can be set (None, MD5, and SHA), and Privacy protocols can be set (None, DES, AES). A password can be assigned to each protocol as well, with a minimum of 8 characters.

Figure 14 SNMP V3 User Edit Menu



NOTE

When a user is created, it will automatically be assigned to the first-created group (if available). Reassignment of a user's group can be done in the user edit menu.

NOTE

If a group is deleted, its users MUST be re-assigned to new group(s), otherwise those users will be blocked from logging in.

NOTE

If you are changing from V2C to V3, the V2C settings/configs will remain until the V3 users and groups are set up. Similarly, if going from V3 back to V2C, the V3 settings/configs will remain until the users and groups are deleted.

NOTE

Changes to SNMP v3 Users and Groups may not fully take effect until the sensor is rebooted. If users or groups are edited or removed, a reboot is recommended to ensure changes are applied.

Table 1 SNMP Configuration Commands

Name	Access Level	Description
sensorTrapsEnable	read-write	Enable/disable all traps. 1 = Disabled 2 = Enabled
snmpTargetIP	read-write	IP address for one trap receiver target, in standard format (###.###.###.###).
snmpTargetIPIndex	read-only	Unique index for IP target entry.

SNMP Traps

NOTE

Traps may be enabled and disabled using the UI or SNMP.

Traps are messages sent to the SNMP manager by the 4046E when events occur.

NOTE

Do not enter duplicate SNMP IP addresses. Duplicate IP addresses entered into SNMP Manager Address fields will cause duplicates of SNMP messages sent to an SNMP server.

To enable SNMP Trap functionality, connect to the 4046E User Interface, enable Traps, and enter the SNMP Manager's IP address. Up to 5 SNMP IP addresses may be added. IP addresses may be set on the UI or via the SNMP manager.

A trap message will be sent to designated host computers whenever the sensor detects an alarm condition.

Table 2 SNMP Trap Definitions

Name	Message	Description
minRtLossAlarmTrap	sensor4046EName, sensor4046EMinRtLoss Limit, sensor4046EMinRtLossAlarm, sensor4046ERtLoss, sensor4046ERtLossAlarmFrequency	Alarm that occurs when a Return Loss is below the minimum alarm limit.
maxRtLossAlarmTrap	sensor4046EName, sensor4046EMaxRtLossLimit, sensor4046EMaxRtLossAlarm, sensor4046ERtLoss, sensor4046ERtLossAlarmFrequency	Alarm that occurs when a Return Loss is above the maximum alarm limit.
minTempAlarmTrap	sensor4046EName, sensor4046EMinTempAlarmLimit, sensor4046EMinTempAlarm, sensor4046ETempAlarmValue	Alarm that occurs when the Temperature is below the minimum alarm limit.
maxTempAlarmTrap	sensor4046EName, sensor4046EMaxTempAlarmLimit, sensor4046EMaxTempAlarm, sensor4046ETempAlarmValue	Alarm that occurs when the Temperature is above the maximum alarm limit.
interferenceAlarmTrap	sensor4046EName, RSSISweepLimitLevel, sensor4046EInterferenceAlarm, sensor4046EInterferenceAlarmValue, sensor4046EInterferenceAlarmFrequency	Alarm that occurs when an RSSI signal is above the maximum interference alarm limit.

Table 3 SNMP Measurement Commands

Name	Access Level	Description
rtLossSweepStartFreqHz	read-write	Start frequency for return loss measurement sweep, in Hz. (100-1000 MHz)
rtLossSweepStopFreqHz	read-write	Stop frequency for return loss measurement sweep, in Hz. (100-1000 MHz)
rtLossSweepNumPoints	read-write	Number of measurement points in return loss sweep mode (2-255)
RSSISweepContinuous	read-write	Enable/disable continuous RSSI sweep measurements. (1 = Disabled, 2 = Enabled)
RSSISweepStartFreqHz	read-write	Start frequency for RSSI measurement sweep, in Hz (100-1000 MHz).
RSSISweepStopFreqHz	read-write	Stop frequency for RSSI measurement sweep, in Hz (100-1000 MHz).
RSSISweepLimitLevel	read-write	RSSI limit alarm level, in dBm, hundredths (-550 to -350 represents -55 dBm through -35dBm).
measurementIntervalTimeRef	read-write	Measurement interval date time starting point reference. In local time, as YYYY-MM-DD.HH:MM:SS
measurementIntervalTime	read-write	Time interval between initiating measurements, as Days.Hrs:Mins:Secs, max. 30 days.
measurementPointSubIntervalTime	read-write	Interval between individual measurement points. In milliseconds, max. 3600000 (1 hour). This is used to stagger measurement points in time for sweep mode; the interval is individually selectable for measurement point mode.

Table 4 SNMP Alarm Commands

Name	Access Level	Description
sensorAlarmEnable	read-write	Master enable/disable all alarms. (1 = Disabled, 2 = Enabled)
sensorResetAlarms	read-write	Set to reset all active alarms. Get always returns 0. (2 = Reset)
sensor4046EMinRtLossLimit	read-write	Minimum Return Loss alarm limit. -12600 to -174 (-126.0 to -1.74 dB), or 100 to 1000 (1.00 to 10.00 VSWR). Units (and valid ranges) are hundredths of dB or VSWR, based on the value of sensorRtLossDisplayMode. Return Loss below this value will result in an alarm. Must be less than sensor4046EMaxRtLossLimit.
sensor4046EMinRtLossAlarm	read-only	Indicates whether alarm has occurred for Return Loss below limit on any of the measurement points. (1 = Inactive, 2 = Active)
sensor4046EMaxRtLossLimit	read-write	Maximum Return Loss alarm limit. -12600 to -174 (-126.0 to -1.74 dB), or 100 to 1000 (1.00 to 10.00 VSWR). Units (and valid ranges) are hundredths of dB or VSWR, based on the value of sensorRtLossDisplayMode.Return Loss above this value will result in an alarm. Must be greater than sensor4046EMinRtLossLimit.
sensor4046EMaxRtLossAlarm	read-only	Indicates whether an alarm has occurred for Return Loss above limit on any of the measurement points. (1 = Inactive, 2 = Active)
sensor4046ERtLossAlarmValue	read-only	Value at last Return Loss alarm. -12600 to -174 (-126.0 to -1.74 dB), or 100 to 1000 (1.00 to 10.00 VSWR). Units (and valid ranges) are dB or VSWR, based on the value of sensorRtLossDisplayMode.
sensor4046ERtLossAlarmFrequency	read-only	Frequency at most-recent Return Loss alarm. Units are in Hz.
sensor4046EMinTempAlarmLimit	read-write	Minimum Temperature alarm limit for the sensor, in Celsius. Temperature below this value will result in an alarm. Must be less than sensor4046EMaxTempAlarmLimit.
sensor4046EMinTempAlarm	read-only	Indicates whether alarm has occurred for Temperature below limit. (1 = Inactive, 2 = Active)
sensor4046EMaxTempAlarmLimit	read-write	Maximum Temperature alarm limit for the sensor, in Celsius. Temperatures above this value will result in an alarm. Must be greater than sensor4046EMinTempAlarmLimit.
sensor4046EMaxTempAlarm	read-only	Indicates whether alarm has occurred for Temperature above limit. (1 = Inactive, 2 = Active)

sensor4046ETempAlarmValue	**read-only**	**Value at last Temperature alarm. Units are in Celsius.**
sensor4046EInterferenceAlarm	**read-only**	**Indicates whether alarm has occurred for RSSI signal above the interference limit on any of the measurement points. (1 = Inactive, 2 = Active)**
sensor4046EInterferenceAlarmValue	**read-only**	**Power level recorded at most recent RSSI Interference alarm. Units are in dBm.**
sensor4046EInterferenceAlarmFrequency	**read-only**	**Frequency value recorded at most recent RSSI Interference alarm. Units are in Hz.**
sensor4046EInterferenceAlarmTimestamp	**read-only**	**Time in UTC of most recent RSSI Interference alarm.**

Table 5 SNMP Measurement Point Table Commands

Name	Access Level	Description
measPtFrequencyHz	read-create	Center frequency of measurement point in Hz. Read-only when sensorCfgMode is set to Sweep.
measPtRtLoss	read-only	Return Loss in dB or VSWR, based on the value of sensorRtLossDisplayMode.
measPtName	read-create	Name assigned to measurement point. Cannot be blank. All leading and trailing whitespace and control characters are stripped from the input.
measPtAlarmEnable	read-create	Enable/disable alarms for this measurement point. (1 = Disabled, 2 = Enabled)
measPtMinRtLossLimit	read-create	Minimum Return Loss alarm limit for this measurement point. Return Loss below this value will result in an alarm. Must be less than measPtMaxRtLossLimit. Units are dB or VSWR, based on the value of sensorRtLossDisplayMode.
measPtMaxrtLossLimit	read-create	Maximum Return Loss alarm limit for this measurement point. Return Loss above this value will result in an alarm. Must be greater than measPtMinRtLossLimit. Units are dB or VSWR, based on the value of sensorRtLossDisplayMode.
measPtEnable	read-create	Enable or disable a measurement point. (1 = Disabled, 2 = Enabled)
measPtRemove	read-create	Set to remove this measurement point. Get always returns 0. (1 = Remove)

Table 6 SNMP Interferers Table Commands

Name	Access Level	Description
interfererFrequencyHz	read-only	Center frequency of interferer in Hz.
interfererPower	read-only	Power of interferer in dBm.
interfererTimestamp	read-only	Interferer detection wall clock time, in UTC

Update Sensor Firmware

The 4046E sensor's functionality is enabled by firmware installed on the sensor. This firmware can be updated by accessing the firmware update utility on the 4046E sensor's Firmware Update Utility webpage. Firmware updates are designed to load completely without user interaction at the installation site.

To update firmware:

1. Download the firmware from the product page on the Bird website: www.birdrf.com.
2. Click the ☰ menu on the right side of the 4046E's UI webpage, then click the **Update** button to access the firmware update utility.
3. Click the **Upload File** button on the firmware update utility and navigate to the downloaded file.
4. Click **Apply** button when the "Apply Update?" dialog is displayed. The update process will begin and could take 10-15 minutes to complete. Do not navigate away from the webpage, or else the update will fail.
5. Wait until "Update Successful" dialog box is displayed, then click the **Refresh** button.

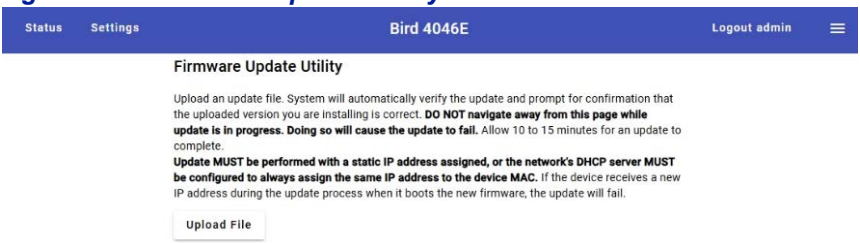
NOTE

Firmware updates are designed to load completely without user interaction at the installation site. Connection speeds to remote sites may delay upload and application. In the event of failure, the sensor will maintain its original firmware. Should this occur, simply re-start the update process.

NOTE

The 4046E will reboot during the firmware update; the IP address must be the same following the reboot to ensure the Web UI will be accessible following the firmware update.
If network Configuration Mode is set to Static, the IP address will be the same following reboot.
If network Configuration Mode is set to DHCP, the DHCP server should be configured to always assign the same IP address to the 4046E.

Figure 15 Firmware Update Utility



Manage Users

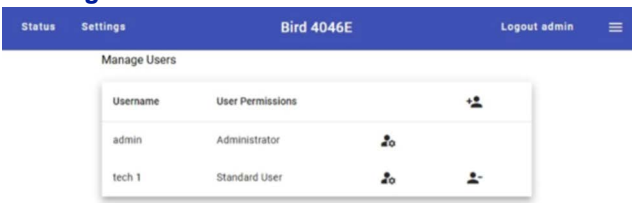
The Manage Users option is available to manage user passwords. Multiple usernames with passwords may be added. The default admin username cannot be changed, but the password should be changed from the default.

Add User

To add a user, click . Enter a username. Each username must be unique.

User Permissions are Standard or Administrator.
Administrator privileges have no restrictions and may change any 4046E settings. Standard User privileges allow the user to only change RF settings such as enabling/disabling alarms, setting thresholds, and changing their own password. Standard User privileges prevent the user from making any changes to user accounts, SNMP, IP Address, NTP servers, or update firmware.

Figure 16 Mange Users Screen



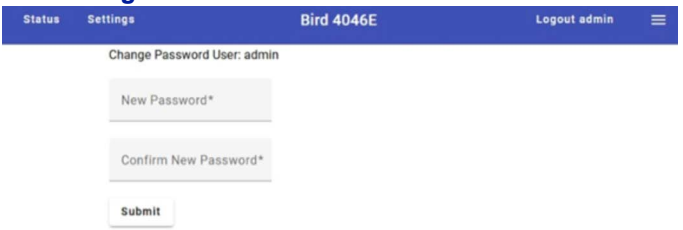
Change Password

Users may use the change password option in the configuration menu to change the password for their account. Bird recommends maintaining a secure record of all unique usernames and passwords, particularly if multiple users require access to the 4046E. Use the space below to note this information if desired.

Username: _____

Password: _____

Figure 17 Change Password



Reboot

The 4046E User Interface includes an option to reboot the sensor. This allows the sensor to be rebooted from a remote location. This avoids the need to physically disconnect the sensor from its power source.

About Screen

The About screen displays information about the 4046E sensor, including model number, serial number, calibration date, and software versions.

The information on the About screen may also be accessed using SNMP.

Figure 18 About Screen

Table 7 SNMP Sensor Information

Name	Access Level	Description
sensor4046EName	read-only	Name assigned to sensor.
sensor4046EModel	read-only	Model number of sensor.
sensor4046ESerialNumber	read-only	Serial number of sensor.
sensor4046Elocation	read-write	User-defined location assigned to the sensor. All leading and trailing whitespace and control characters are stripped from the input.
sensor4046ECalDate	read-only	Calibration date of sensor.
sensor4046EApplicationVersion	read-only	Sensor Measurement Application version.
sensor4046EMfgDate	read-only	Date sensor was manufactured.
sensor4046ECurrentTime	read-only	Current (clock) time, in UTC.
sensor4046ETemperature	read-only	Internal sensor temperature, in Celsius.
sensor4046EUptime	read-only	Sensor up time.
sensorRtLossDisplayMode	read-write	Units in which Return Loss values will be displayed. (0=dB or 1=VSWR)
sensorCfgMode	read-write	Determines how the sensor performs its measurements. Sweep uses start & stop freqs. and number of points. Points mode allows for config. of individual meas. points with their own freq. and alarm thresholds. (0 = Sweep, 1 = Points)
firmwareVersion	read-only	Firmware Version running on the 4046E. Equivalent to Build Version on the About screen.

Chapter 4 Maintenance

Factory Reset

The 4046E includes a reset button which can be used for resetting the unit's IP address and other settings. The reset button is recessed in a hole on the bottom of the unit near the Ethernet jack, see Figure 19.

Power must be applied to the 4046E to perform either of the following reset options.

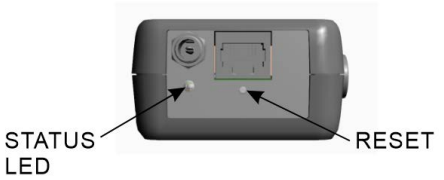
Reset IP Address

Press and release the button to reset the IP Address, the Status LED will briefly change to red. The IP address will be reset to the default of 192.168.3.200.

Reset All Settings

Press and hold the reset button for a minimum of 5 seconds, then release the button. The Status LED will flash red five times to indicate all settings are being reset. The sensor settings and users will be wiped and the unit will be reset to factory defaults. The reset will take approximately 30 seconds to complete. The hostname and NTP Server are never reset.

Figure 19 Factory Reset



Calibration Statement

The 4046E RX Antenna Monitor is designed to maintain accuracy and reliability over time without the need for regular calibration. The product's design minimizes drift, as the sensor is intended to stay in-line and not be removed, ensuring consistent performance without the need for periodic recalibration.

Contact the Bird Service Center in the event the sensor requires additional maintenance. See "Customer Support Services" on page 27.

Customer Support Services

Repairs, Maintenance, and Warranty-Related Services

Any maintenance or service procedure beyond the scope of those in this chapter should be referred to a qualified service center.

If the unit needs to be returned for any reason, request a Return Material Authorization (RMA) through the Bird Technologies website using the Service Pricing and RMA Request landing page: https://birdrf.com/service-request

All instruments returned must be shipped prepaid and to the attention of the RMA number.

Bird Service Center

30303 Aurora Road

Cleveland (Solon), Ohio 44139-2794

Phone: +1 440-248-1200

Email: *bsc@birdrf.com*

Technical Support

For technical support, including help with products (new, replacement, and upgrade), advice, troubleshooting, browse existing FAQ and Knowledge Base articles, or filing a support ticket, use our Technical Support Portal:

https://birdrf.zendesk.com/hc/en-us

Chapter 5 Specifications

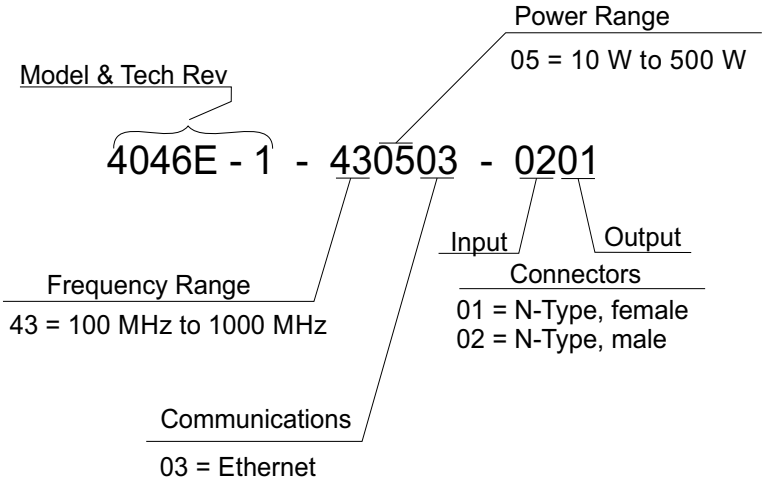
Specification	Value
Measurement Type	In-line, switched reflectometer
Frequency Range	101 to 1000 MHz
Measurement Bandwidth	25 kHz
Measurement Type	Single frequency or swept
Measurement Range (Return Loss)	-26 to 0 dB
Frequency Resolution	1 kHz
Test signal output (to antenna)	-10 dBm, nominal
Test signal leakage (to radio)	-30 dBm, max
Impedance, Nominal	50 Ohms
Measurement duration	250 ms, max per measurement frequency
Insertion loss, Max	0.7 dB max.
Insertion VSWR, Maximum	1.3 typical
RF Connectors Input Output	 Type-N (male or female) Type-N (male or female)
Max signal level	-10 dBm
Interfering Signal Detector Frequency Range Interference Detection Threshold Level Maximum Signal Level Measurement Bandwidth Indication Log	 >100-1000 MHz, User selectable span, 140 MHz max. span User selectable from -55 dBm to -35 dBm -10 dBm 25 kHz Via WebUI display and SNMP trap Recallable via WebUI with ability for user to delete log history
Data Interfaces	Ethernet 10 BASE-T/100 BASE-TX (auto-sense) Version 2.0/IEEE 802.3
Power Requirement DC Power Jack External P.S.	5.5-25 VDC, 3.5 W maximum input 0.08” (2mm) power jack 15V AC adapter included (7001A920)
Operating Temperature Range Sensor AC Adapter	 0° C to +50° C (32° F to 122° F) 0° C to +40° C (32° F to 104° F)
Storage Temperature Range Sensor AC Adapter	 -40° C to +80° C (-40° F to 176° F) -20° C to +80° C (-4° F to 176° F)

Humidity Sensor AC Adapter	 95% maximum (non-condensing) 80% maximum (non-condensing)
Environment	Indoor use only
Pollution Degree	2
Altitude (Max.)	15,000 ft. (4600 m)
Weight (Approx.)	0.6 lb. (0.27 kg)
Dimensions, Nominal Without Connectors	5.4" L x 3.8" W x 1.4" H (137.0 mm x 97 mm x 36 mm)

Model Identification

NOTE

The Model Identification guide is provided to allow existing model numbers to be understood. However, not all combinations may be available. Please contact Bird for more information on new model number requests.



Limited Warranty

All products manufactured by Seller are warranted to be free from defects in material and workmanship for a period of one (1) year, unless otherwise specified, from date of shipment and to conform to applicable specifications, drawings, blueprints and/or samples. Seller's sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by Seller.

If Seller's products are claimed to be defective in material or workmanship or not to conform to specifications, drawings, blueprints and/or samples, Seller shall, upon prompt notice thereof, either examine the products where they are located or issue shipping instructions for return to Seller (transportation-charges prepaid by Buyer). In the event any of our products are proved to be other than as warranted, transportation costs (cheapest way) to and from Seller's plant, will be borne by Seller and reimbursement or credit will be made for amounts so expended by Buyer. Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing within ten (10) days from the date of discovery of the defect.

The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer's request and/or to Buyer's specifications. Routine (regularly required) calibration is not covered under this limited warranty. In addition, Seller's warranties do not extend to the failure of tubes, transistors, fuses and batteries, or to other equipment and parts manufactured by others except to the extent of the original manufacturer's warranty to Seller.

The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages. SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR SELLER ANY OBLIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.