Bird®

CHANNEL POWER MONITOR

OPERATION MANUAL

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 apply 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

<div align="center">

WARNING

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

CAUTION

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

</div>

This symbol indicates that a shock hazard exists if the precautions in the instruction manual are not followed.

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

This symbol indicates that the unit radiates heat and should not be touched while hot.

<div align="center">

NOTE

Notes call attention to supplemental information.

</div>

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.

<div align="center">

WARNING

Do not make or break RF cable connections to the power sensors while the circuit is under transmit power. Shut down the transmitter before installing or removing power sensors.

</div>

See page 12

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 & maintenance instructions for models with part numbers beginning with:

CPM models

3141A15   3141A48

Changes to this Manual

We have made every effort to ensure this manual is accurate. If you discover any errors, or if you have suggestions for improving this manual, please send your comments to our Solon, Ohio factory. 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 — Describes the capabilities of the CPM and lists the compatible sensors.

Installation — Provides the procedure for installing the CPM.

Operation — Describes the CPM menus and configuration procedures for the CPM and compatible sensors.

Specifications — This section provides the specifications for all CPM models and the compatible sensors.

Table of Contents

General Description

The Bird Channel Power Monitor (CPM) is a 16-channel power monitoring system that when combined with the analog or digital sensors is capable of continuously monitoring power and VSWR performance simultaneously for up to 16 channels.

To accommodate systems requiring more than 16 channels additional CPMs and Sensors are required making the systems scalable to accommodate any-sized radio system operating between 100 and 1000 MHz (sensor dependent).

The CPM evaluates and monitors LMR systems by checking the key elements of the transmission path in real time and alerting users of degraded performance or failures.

The CPM system can be setup to monitor radio performance, combiner loss, and antenna/feedline characteristics providing continuous information on the health of each component it monitors. This performance data can be viewed on any computer, or on an Android device using the Bird RF Meter App. The unit features data logging which enables the long term monitoring of system performance and trend analysis. In addition, the CPM will identify critical changes in performance and generate alarms. The system provides user notification of alarm conditions and status changes via the SNMP (version 2) format.

The CPM system is composed of a central display unit and individual power sensors as shown in Figure 1.

Figure 1   CPM and Available Sensors

Item	Model Number	Description	Sensor Type	Channels
1	3141A15 3141A48	CPM Display Unit (two models available)		16 available per unit
2	4042	Channel Power Sensor	Digital	occupies up to 16
3	4043	Directional Power Sensor	Digital	occupies 1
4	4044	Non-Directional Power Sensor	Analog	occupies 1
5	5009	Directional Power Sensor	Analog	occupies 1

Model 3141A15 - Operates on a +15 VDC input, an external AC power Supply is provided with the unit.

Model 3141A48 - Operates on a ± 48 VDC input, the ± 48 VDC power supply is customer supplied.

There are two types of power sensors that may be used with the CPM:

- Analog
- Digital

Analog sensors are available in directional and non-directional models. Non-directional sensor model 4044 is covered in detail in Bird manual # 920-4044. The 4044 power sensor is available in six differing models that cover bands from 118 to 940 MHz. Directional sensor 5009 is covered in manual # 920-5010S. The 5009 power sensor utilizes plug-in elements which are available in a variety of frequency bands and power levels. The CPM is capable of continuously monitoring up to 16 analog power sensors.

NOTE

Each analog sensor connected to a CPM will occupy 1 of the 16 available channels.

Digital sensors are available in directional models. Directional sensor model 4043 is covered in manual # 920-4043. The 4043 power sensor is available in six differing models that cover bands from 118 to 940 MHz. Channel power sensor model 4042 is covered in manual # 920-4042. The 4042 Channel Sensor covers an overall frequency range of 100 to 1000 MHz. It is capable of measuring up to 16 SINGLE channels in the presence of multiple channels at the output of a frequency combiner. The CPM is capable of continuously monitoring up to 16 digital power sensors.

NOTE

Each 4043 power sensor connected to a CPM will occupy 1 of the 16 available channels.

NOTE

Each 4042 sensor is capable of occupying all 16 available channels. A maximum of two 4042 sensors may be connected to a CPM. If two 4042 sensors are used they must share the 16 available channels.

Analog and digital power sensors may be used together with a single CPM. There is, however, a maximum of 16 channels that may be monitored by a single CPM, if more than 16 channels must be monitored, additional CPMs are required.

It is important for the user to order the model of sensors necessary to cover their frequencies of interest. See the "Specifications" section for full details of each sensor.

The CPM is designed for use in a 19 inch rack and occupies one rack unit of space. The central display user interface is via the front panel display and buttons or via an Internet connection and a network accessible web page (GUI interface).

The front of the central display unit is shown in Figure 2 on page 4 and the rear panel is shown in Figure 3 on page 5.

See the "Specifications" section for details on the CPM display unit.

Unpacking and Inspection

1. Carefully inspect shipping container for signs of damage.
   - If the shipping container is damaged, do not unpack the unit. Immediately notify the shipping carrier and Bird Technologies.
   - If the shipping container is not damaged, unpack the unit. Save shipping materials for repackaging.
2. Inspect unit for visual signs of damage.

> **NOTE**
>
> *If there is damage, immediately notify the shipping carrier and Bird Technologies.*

What's Included

In addition to the Channel Power Monitor the following items are packed with the units as indicated.

Part Number	QTY	Description	Model 3141A15	Model 3141A48
5A2076-2	1	2-pin plug, 22-28 VDC	✓	✓
5A2076-3R8-2	1	2-pin plug, 48 VDC		✓
5A2076-3R5-3	1	3-pin plug, Alarm Out	✓	✓
5A2076-3R5-6	1	6-pin plug, User Inputs	✓	✓
5A2076-2R5-10	2	10-pin plug, PTT	✓	✓
5A2968T	2	Termination plug	✓	✓
5A2286S-KIT1	1	Cable marking kit	✓	✓
7005A836-6	1	Power supply, 15 VDC	✓	
4421-055	1	AC Power cord	✓	

External Controls, Connectors, and Indicators

Figure 2   CPM Front panel
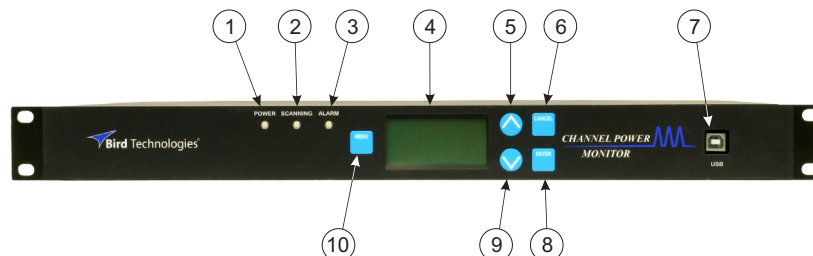
Item	Name	Description
1	Power LED	When illuminated (green) it indicates that the unit is powered on.
2	Scanning Status LED	This LED blinks (green) when the system is in the scanning mode. The scanning mode is the normal mode of operation.
3	Alarm LED	When illuminated (red) it indicates that an alarm has been triggered. **Note:** *Alarms are only monitored in scanning mode, Alarm LED and SNMP messages are only generated when scanning mode is active.*
4	Display Screen	Backlit 4 line LCD display which is used to show the setup menus, diagnostic screens, and scanning mode screens.
5	Up Arrow Button	When pressed will scroll the user up through menu screens. When configuring a menu item this button is used to change values of menu items.
6	Cancel Button	When pressed it will discard any menu changes and will exit from the configuration mode.
7	USB Port	This port is used to load firmware updates into the CPM display unit.
8	Enter Button	Used to accept changes on menu screens. When configuring a menu item this button is used to cycle through menu options.
9	Down Arrow Button	When pressed will scroll the user down through menu screens. When configuring a menu item this button is used to change values of menu items.
10	Menu Button	When pressed will return the user to the main default display.

Figure 3   CPM Rear panel

Item	Name	Description
1	Input Power Connections	Model 3141A15 - The +15 VDC connector is fed from an external AC/DC adapter and is the normal method for powering this model. Model 3141A48 -The 48 VDC connector is fed from a customer supplied 48 VDC (+48 or -48) power supply and is the normal method for powering this model. **All Models:** 22-28 VDC terminal pins are for a battery backup input.
2	User Defined Inputs	There are 3 user defined inputs which can be connected to sensors/contacts of the customers choice. User inputs are 2-wire circuits (IN1/2/3 terminal +associated GND terminal), the inputs may be configured for normally open or normally closed circuits. An alarm condition will be generated by the CPM when the circuit is tripped.
3	Alarm Form-C Contacts	Whenever the CPM generates an alarm these contacts will change state. During normal operation (CPM display unit powered-up) the NO to Com terminals will have no continuity and likewise the NC to COM terminals will have continuity. When an alarm condition is detected these two contact pairs will change state and will stay that way until the alarm condition is cleared.
4	Expansion Port	Currently not used.
5	Push-To-Talk Inputs	When the push-to-talk feature is enabled (via software) these pins (1 for each of the 16 power sensor input channels) must be connected to ground in order to enable monitoring for that channel. The push-to-talk feature makes sure the transmitter is on before allowing power monitoring to take place.
6	Digital Sensor inputs	There are two digital sensor inputs, up to 16 digital sensors may be serially connected (daisy chained). Each digital sensor is assigned a unique address when added to the CPM. **Note:** *Digital sensors must be connected one at a time and added using the menus during the enrolling process.*
7	Analog Sensor inputs	There are 16 analog inputs. RJ-25 connectors are used to connect each analog channel to an analog sensor.
8	LAN Port	The LAN port is used to connect the CPM to an Ethernet network. The CPM may be configured to send SNMP messages via Ethernet, and the CPM web interface may be accessed through the network.
9	RS-232 Port	Currently not used.
10	Ground	This is the chassis ground lug for the display unit. The display unit must be properly grounded.

Theory of Operation

A CPM is capable of monitoring digital (4042-Series and 4043-Series) and analog (4044-Series) power sensors simultaneously, a single CPM may monitor a maximum of 16 channels.

For optimal performance using 4042-Series and/or 4043-Series sensors, each CPM should be used to display a maximum of 8 channels. When 4044-Series sensors are used exclusively, each CPM can be used to display the maximum 16 channels.
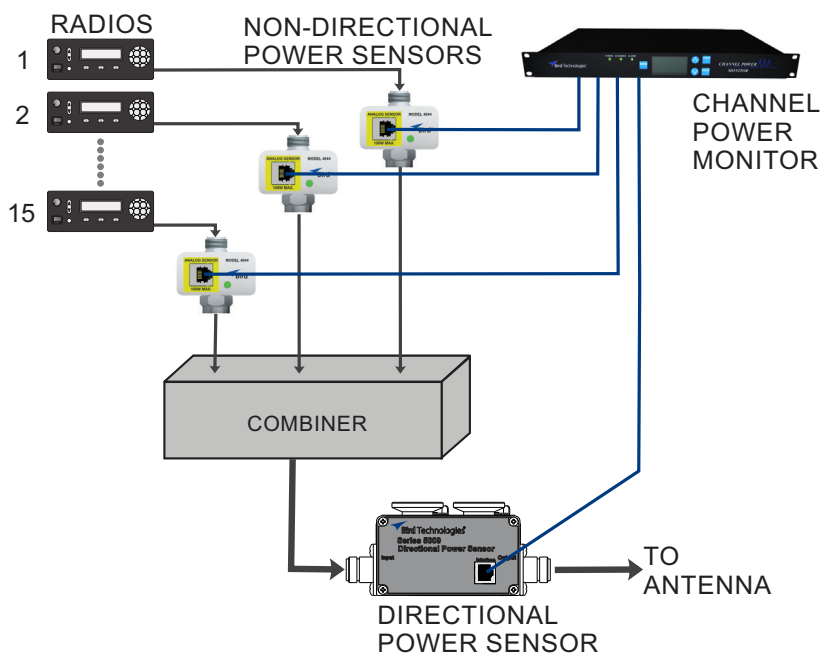
Analog Power Sensors

The CPM is capable of monitoring up to 16 individual analog power sensors simultaneously. A typical CPM installation is shown in Figure 4. In this example both non-directional and directional Analog sensors are used to monitor system performance.

Non-directional power sensors (model 4044) are placed between each radio and the inputs of the combiner. These sensors measure the power output of the radios and transmission lines. Changes in a radios output power level as measured at the CPM can generate alarms. A directional sensor (model 5009) is placed in-line at the output of the combiner to measure forward power and reflected power, thus providing a measurement of total output power and the capability of measuring VSWR. With such positioning of directional and non-directional sensors it is possible to spot degradation or failure at specific points in the system. This power sensor based measurement approach helps improve reliability of the LMR system.

Each Analog sensor is connected to an analog sensor input on the back of the CPM, only 16 analog input ports are available on each CPM.

Each CPM is limited to monitoring only 16 channels. Each analog sensor occupies 1 channel, to monitor more than 16 analog sensors, additional CPMs must be used. Another option is to add "Digital Power Sensors" to the system.

Figure 4   Analog Sensor Connections

Digital Power Sensors

Digital sensors offered by Bird are directional sensors capable of measuring forward power and reflected power, thus providing a measurement of total output power and the capability of measuring VSWR.

4043 model digital sensors are available in a variety of frequency ranges and must be matched to the bandwidth in use. Each 4043 sensor occupies 1 CPM channel. The 4042 model digital sensors are channel sensors, these sensors are unique in that they are able to measure the forward power, reflected power and VSWR of up to 16 SINGLE Channels in the presence of multiple channels at the output of a frequency combiner. Each 4042 sensors can occupy up to 16 CPM channels.
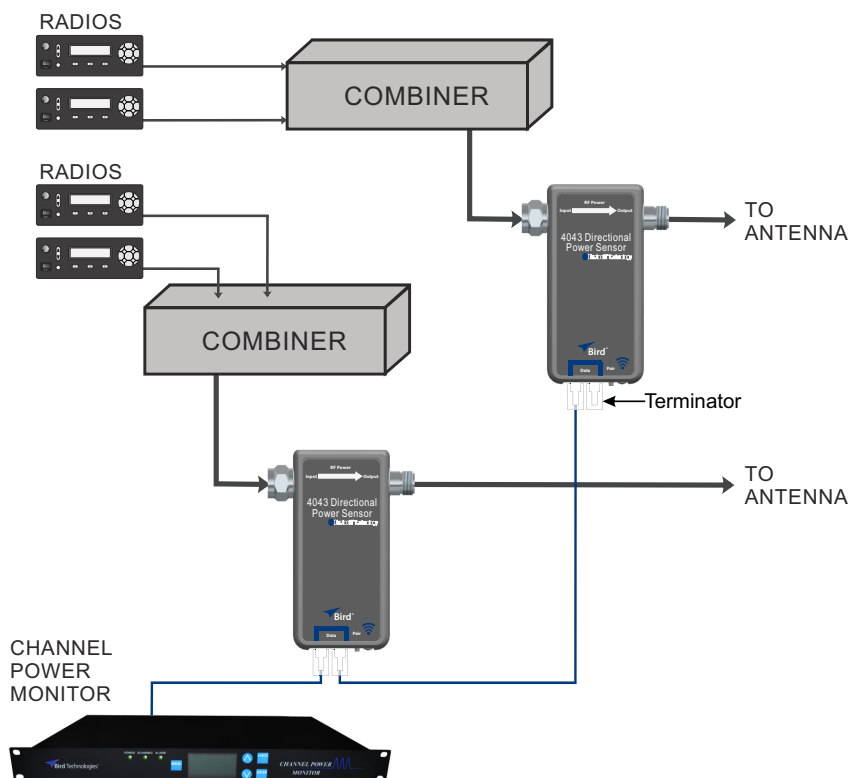
When digital sensors are used, each CPM should be limited to monitoring only 8 channels to monitor more than 8 channels, additional CPMs must be used.

The CPM is capable of monitoring up to 8 - 4043 power sensors simultaneously or up to 2 - 4042 power sensors, or a maximum of 8 channels if a combination of 4042/4043/4044 series sensors are used. A typical CPM installation is shown in Figure 5. In this example digital sensors are used to monitor system performance.

The digital sensors use an RS-485 serial bus for data transfer to and from a CPM. Each sensor is equipped with two RJ-25 jacks, either jack may be connected to a CPM. The second RJ-25 jack may be used to extend the RS-485 bus to another digital sensor, see Figure 5. Multiple sensors may be serially connected in this fashion, allowing as many as 16 sensors to be connected to a CPM.

Terminator plug — Digital sensors require a terminator plug (included, part No. 5A2968T) be installed in the open Digital Sensor RJ-25 port on the rear panel of the CPM (if available), or in the last sensor installed in the digital sensor chain.

Figure 5   Digital Sensor Connections

Channel Power Monitoring Performance Specification

The Channel Power Monitoring solution offers real-time RF power monitoring across multiple sensors. Below are the key performance expectations and limitations when capturing alarms via the web interface, particularly during simultaneous measurements.

Measurement Update Rate — Up to 2 readings per second per sensor; actual performance may vary with network conditions and sensor count.

Web Interface Latency — Optimized for updates within 1 second, though latency may increase as the number of sensors grows.

Alarm Capture — Alarms are reported within 2 seconds of detection, though performance can vary with system complexity.

Max Number of Channels — For optimal performance, limit each 3141 module to 8 channels when using 4042 and/or 4043 sensors. If using 4044 sensors exclusively, up to 16 channels can be configured.

Recommendations — Adhere to the recommended sensor limits for best performance. For larger setups, consult support.

Limitations and Recommendations

Performance Degradation — Exceeding the recommended sensor limits may result in slower updates and delayed alarms.

Recommendations

- Keep the channel count within specified limits for optimal performance.

CPM Channel Configuration Worksheet

This worksheet can be used to determine optimum configuration for a communications system. Make additional copies if needed.

Column 1 — Used to list number of radios and frequencies used in the communications system.

Column 2 — If single channels sensors (4043 or 4044) will be used enter them in column 2.

Column 3 — If multi-channel sensors (4042) will be used enter them in column 3 (maximum of 2 per CPM).

Column 4 — Enter the number of channels to be programmed into the 4042 sensors (maximum of 16 channels across all sensors).

If the number of channels exceed 16 or there are more than 16 analog sensors or 8 digital sensors then more than one CPM is required to monitor the entire system. Refer to the notes at the bottom of the worksheet.

1. Maximum of 16 channels may be used for each CPM. 8 if digital sensors are used.
2. Maximum of two 4042 sensors may be used for each CPM.
3. Maximum of 16 analog sensors may be used for each CPM (without digital sensors).
4. Maximum of 8 sensors (analog & digital) for each CPM, when digital sensors are being used.

Installation

Bird provides the power monitor display unit and the power sensors. Model 3141A15 includes an AC/DC adapter, model 3141A48 requires a customer supplied ± 48 VDC power source. All additional parts required for installation must be supplied by the customer. All work should be performed by qualified personal who are familiar with the communications system.

Installation Procedure

The power monitor display unit is designed for indoor mounting in a common 19-inch relay rack or cabinet. The power sensors are designed for in-line mounting in the communications system RF signal path. The following steps are required for proper installation of the CPM system.

1. Install the power monitor display unit into the rack or cabinet using four mounting screws (not included). Use a nylon washer under the head of the screws to protect the front panel. Torque the mounting screws to no more than 15 in/lbs. Over tightening the mounting screws may damage the front panel.

2. If you have a supervisory alarm system, connect its wiring harness to the alarm output terminals using 3-pin plug (included, part no. 5A2076-3R5-3). See Figure 6.

    The Alarm system is for a 2-wire circuit either normally open (NO) or normally closed (NC), one wire connects to the ground terminal the other wire to the appropriate terminal (NO or NC). See "Alarm Contacts" on page 36.

Figure 6   Alarm Out Connector Installation

3. If you have Non-Bird alarm sensors to monitor (up to three maximum), connect their wiring harness to the User Input terminals using supplied 6-pin plug (included, part no. 5A2076-3R5-6). See Figure 7 on page 11.

> **NOTE**
>
> *The user input terminals are configured for normally open (NO) or normally closed (NC) operation via CPM software.*

The User Input terminals are for 2-wire circuits, either normally open (NO) or normally closed (NC), one wire connects to an input terminal (IN1, 2, or 3) and the other wire to the associated ground terminal. See "User Defined Input Configuration" on page 25.

Figure 7   User Input Connector Installation

> **NOTE**

The monitoring unit does not have an on/off switch so the unit will power-up as soon as either the primary or backup voltage is connected.

4. If backup voltage is available, connect it to the backup voltage terminals using the supplied 2-pin plug (included, part no. 5A2076-2).

Figure 8   Battery Backup connector Installation

5. Connect the primary input power source.

    a. Model 3141A15, connect the +15 VDC output of the AC adapter to the power input connector.

> **NOTE**

The 3141A48 requires a customer provided 48 VDC input, the input may be either +48 or -48 VDC.

    b. Model 3141A48, connect customer supplied ± 48 VDC power source to the power input connector using 2-pin plug (included Part No. 5A2076-3R8-2, see Figure 9. The CPM draws a nominal 1 Amp at 48 Volts. The input connector is designed for 16 to 30 gauge wire, use the appropriate gauge based on current draw and cable length.

Figure 9   48 VDC Wiring Diagram

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6. Install Push to Talk (PTT) connections using 10-pin plug (2-included Part No. 5A2076-2R5-10), see Figure 10. The push-to-talk feature makes sure the transmitter is on before allowing power monitoring to take place. Each radio will have a ground and PTT connection. See "Push-To-Talk (PTT)" on page 24.

   Bird recommends dry contact relays be used to couple the push-to-talk signal from the radios to the PTT terminals on the CPM. Such that the push-to talk function of the radio would energize the relay and the dry contacts of the relay would be connected to the appropriate input terminals on the rear of the CPM. This will ensure isolation between the equipment. Opto isolators are another good alternative worth consideration.

### Figure 10   Push-to-Talk Connector installation
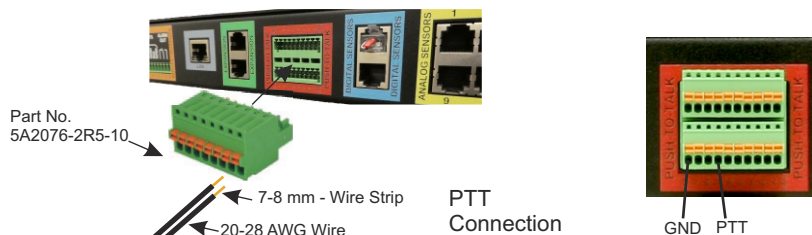
WARNING

Do not make or break RF cable connections to the power sensors while the circuit is under transmit power. Shut down the transmitter before installing or removing power sensors.

7. Install the power sensors in-line in the communications system based on where RF power measurements are desired. The power sensors have N-style input and output RF connectors. See Figure 5 on page 7.

8. Connect power sensor to the monitoring unit, RJ-25 (6 pin) connectors are used at both ends of this cable (included with sensor).

   a. Analog sensors may be connected all at once, then configured after the CPM is powered on. Up to 16 analog sensors may be connected. See "Analog Channel Setup" on page 23.

   b. Digital sensors must be connected one at a time after the CPM is powered on. See "Digital Channel Setup" on page 15. Sensors may be "daisy Chained" together.

   Digital sensors require a terminator plug (included, part No. 5A2968T) be installed in the open Digital Sensor RJ-25 port on the rear panel of the CPM (if available), or in the last sensor installed in the digital sensor chain.

Figure 11   Sensor Connections
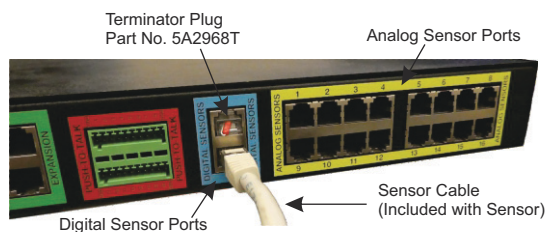
9. Configure the CPM, go to "Operation" on page 13.

Operation

The Channel Power Monitor is software controlled so configuration and monitoring of the system is accomplished via user interface with the front panel using the display screen and the five front panel buttons which are all light blue in color. When the CPM is first powered-up it defaults to the Scanning Mode of operation. This is the normal operating mode. Factory default values will have been programmed into the unit and the customer will need to setup the unit and adjust these default values prior to placing the system into service. All of the possible display screens and adjustable values are discussed in detail in the following sections.
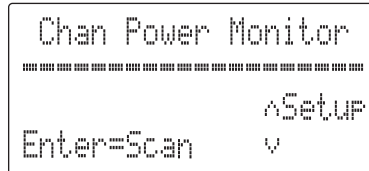
Main Screen

This is the central display screen in the software tree as it allows access to two branches for interaction including scan mode and setup menus. The main display screen is shown in Figure 12 . The two branches in the power monitors software tree which originate at this central default display (scan and setup) can be entered using front panel buttons as follows; UP ARROW and DOWN ARROW buttons for the Setup branch and the ENTER button for the Scan branch.

The setup branch allows the user to change the way the power monitor operates. This branch is typically accessed once when the system is initially setup. The Scan display is the normal display screen for the power monitor, called the Scanning screen, and gives the user an at-a-glance overview of all the channels.

The main display can be accessed anytime by pressing the MENU button on the front panel.

Figure 12   Main Display Screen

```
 ┌─────────────────────────────┐
 │  Chan Power Monitor         │
 │ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ │
 │                    ^Setup   │
 │ Enter=Scan      v           │
 └─────────────────────────────┘
```
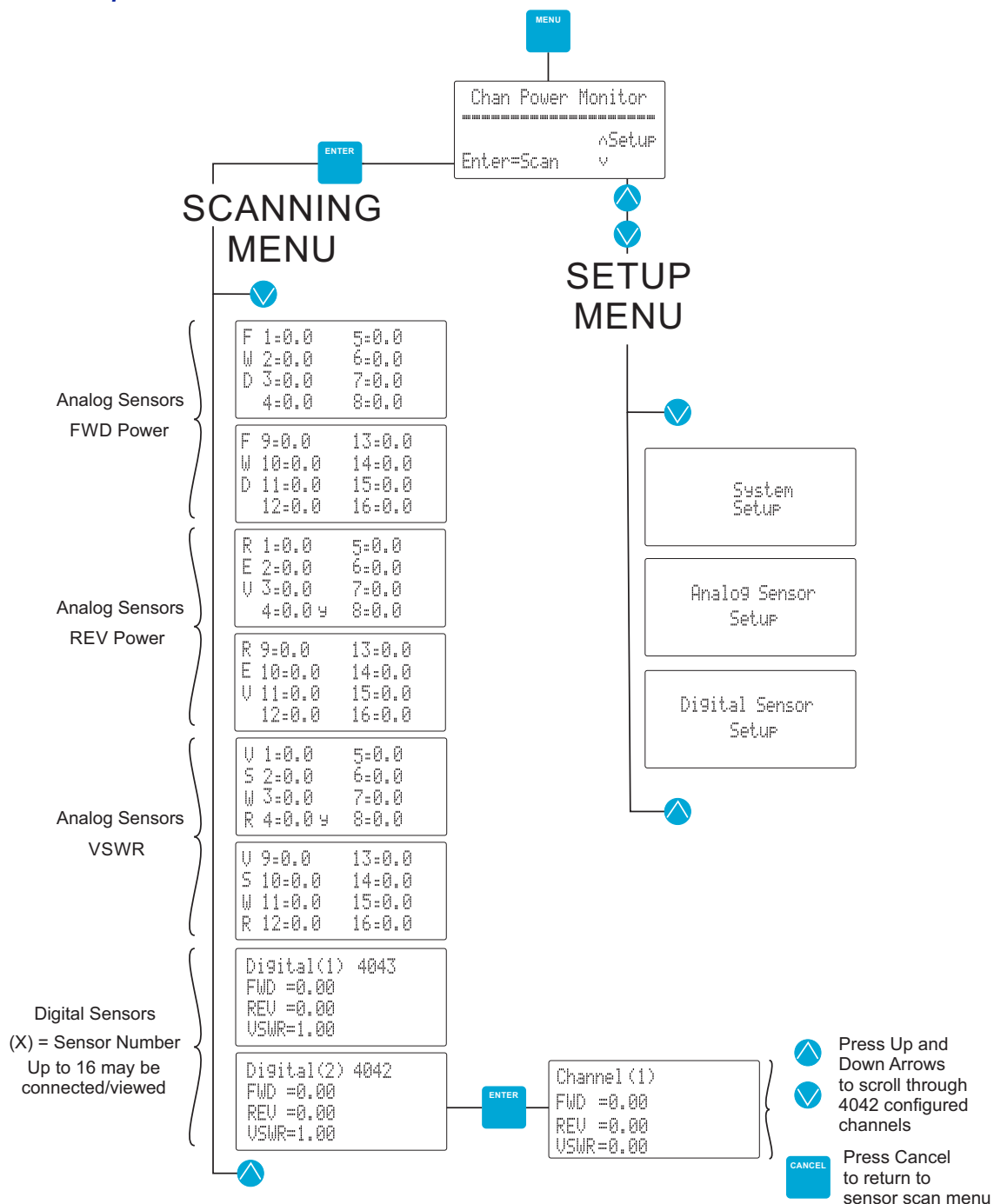
Front Panel Button Functions

Up Arrow
                    setup
Down Arrow

Enter   scanning

Front Panel Menu Structure

Figure 13   Top level menus

Digital Channel Setup

Each digital sensor, when initially connected to a CPM, is assigned a unique RS-485 Bus address. Connect a digital sensor to the CPM using a RJ-25 cable connected to the digital sensor on one end and the digital port on the CPM with the other end.

A terminator plug is required for digital sensors. The terminator plug (included, part no. 5A2968T) should be inserted into the empty port on the rear panel of the CPM, or the empty port of the last sensor in the digital sensor chain, see Figure 14.

> **NOTE**
>
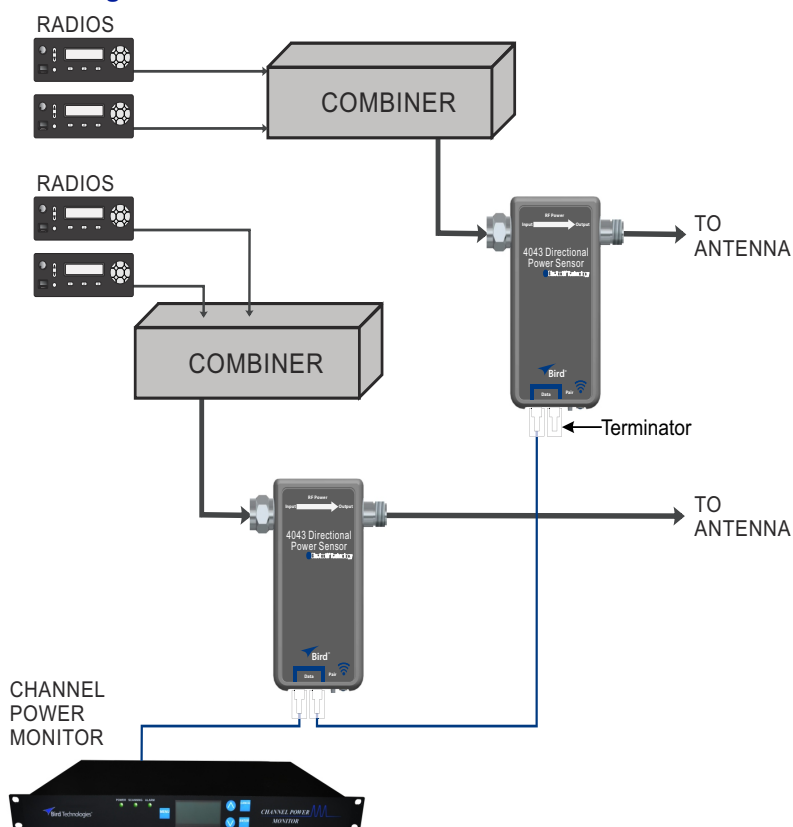> *Connect only one Digital Sensor at a time.*

Additional digital sensors may be connected serially with the first digital sensor (Figure 14). Sensors must be added one at a time and enrolled by the CPM before any additional sensors may be added (See "Digital Sensor Enrollment" on page 16).

> **NOTE**
>
> *The CPM will only recognize two 4042 sensors.*

Figure 14   Daisy Chain Digital Sensors

Digital Sensor Enrollment

<div align="center">

NOTE

</div>

Connect only one Digital Sensor at a time.

1. Connect Digital sensor to CPM.

<div align="center">

NOTE

</div>

The sensor status indicator must be illuminated green before it may be enrolled by the CPM.

2. Press MENU to display the Main Screen.
3. Press the up arrow to display the Digital Sensor Setup screen (Figure 15).
4. Press ENTER to display the Add Digital Sensors Screen
    This screen is used to "enroll" digital sensors connected to the CPM.

Figure 15   Add Digital Sensor Process

<div align="center">
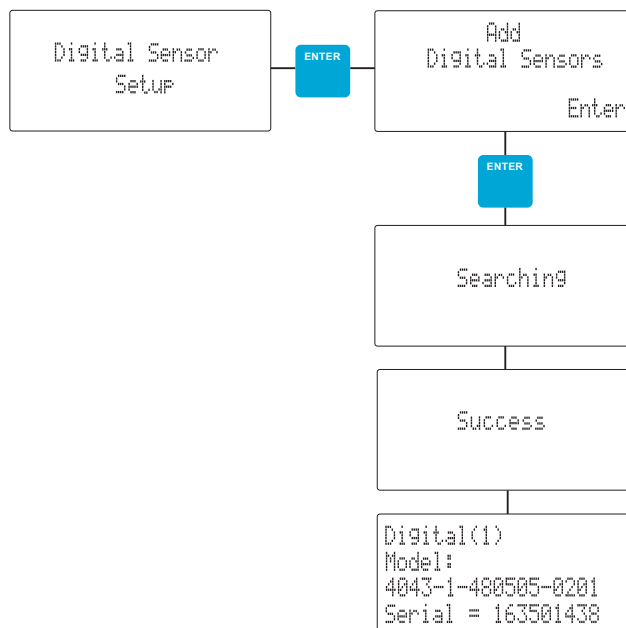
NOTE

</div>

Follow any on-screen instructions during this process.

5. Press Enter to command the CPM to search for new digital sensors. Once the search is complete a "success" message is temporarily displayed before the new sensor digital channel, model, and serial number are displayed (Figure 16).

<div align="center">

NOTE

</div>

The number in parenthesis in Figure 16 is the ID number the CPM assigned to the newly connected sensor.

Figure 16   Digital Sensor Information Screen

6. If additional sensors are to be connected, connect the next sensor.

7. Press MENU to display the Digital Sensor Setup screen.

8. Repeat step 4 and step 5.

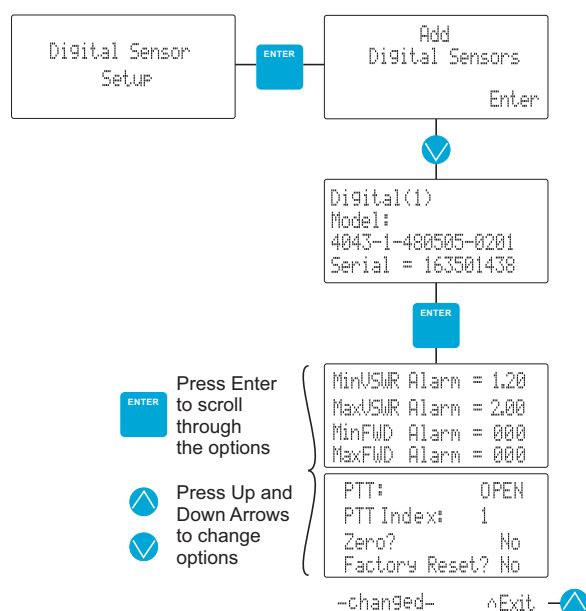9. When all sensors are connected, go to "Digital Sensor Configuration" on page 17.

Digital Sensor Configuration

There are two types of digital sensors, the configuration procedures are different for each type.

- "Digital Sensor 4043 Configuration" on page 17
- "Digital Sensor 4042 Configuration" on page 19

Digital Sensor 4043 Configuration

Figure 17   Digital Sensor Type 4043 Configuration Process

```
Digital Sensor          Add
Setup          ENTER   Digital Sensors

                              Enter

                      Digital(1)
                      Model:
                      4043-1-480505-0201
                      Serial = 163501438

                         ENTER

        Press Enter    MinVSWR Alarm = 1.20
ENTER   to scroll      MaxVSWR Alarm = 2.00
        through        MinFWD  Alarm = 000
        the options    MaxFWD  Alarm = 000

        Press Up and   PTT:          OPEN
        Down Arrows    PTT Index:    1
        to change      Zero?         No
        options        Factory Reset? No

                      -changed-    ^Exit
```

1. With the Digital Sensor Information screen displayed (Figure 16), Press Enter to access the 4043 Digital Sensor Configuration screens.

2. Press ENTER to scroll through the options. A flashing cursor indicates the currently selected option.

3. Use the UP and DOWN arrows to change the selected option.

- MinVSWR Alarm Setting: Lower limit VSWR measurement must reach to cause alarm condition.
  VSWR Alarm threshold may be set from 1.00 (no Alarm) to 9.99

- MaxSWR Setting: Upper limit VSWR measurement must reach to cause alarm condition.

- MinFWD Alarm Setting: Lower limit forward measured power must reach to cause alarm condition.
  The Forward Alarm threshold is a three digit number that can range from 000 to 999 Watts.

- MaxFWD Alarm Setting: Upper limit forward measured power must reach to cause alarm condition.

- PTT Setting: Push to Talk, the default option is DISABLED. Enabled options are OPEN or CLOSED logic.

- PTT Index Setting: The option is used to assign rear panel terminal associated with the Digital Sensor being configured.

NOTE

RF power must be turned off before zeroing a power sensor.

- Zero Setting: Sends Zeroing command to the sensor to calibrate the sensors zero value, this must be done with NO RF POWER applied to the sensor.
  Over time, the sensor's "zero value" (reading with no applied RF power) can drift due to environmental factors (temperature, humidity, etc.) this can make the readings performed by this sensor less accurate.

- Factory Reset Setting: Resets the configuration of the sensor to the factory default settings.
  The Factory Reset option will "dis-enroll" the sensor from the CPM and reset the digital sensor to factory default settings.

NOTE

Exit command is only displayed after scrolling through all options.

4. Press UP arrow to exit configuration menu after the EXIT option is displayed.

Digital Sensor 4042 Configuration

The 4042 Channel Sensor is a unique sensor that is able to measure the forward power, reflected power and VSWR of a SINGLE CHANNEL in the presence of multiple channels at the output of a frequency combiner, see Figure 18.

> **NOTE**
>
> *A maximum of 16 channels may be monitored by a single CPM, if more than one 4042 sensor is connected to a CPM, the available channels must be shared by the two 4042 sensors.*

Figure 18 Channel Sensor Configuration Diagram
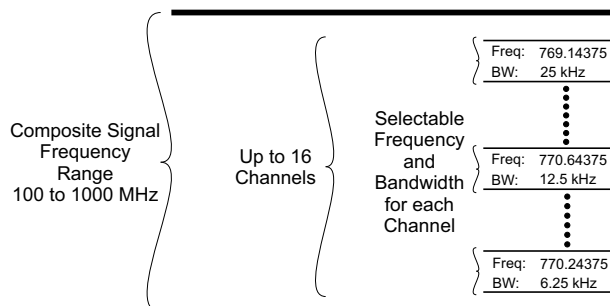
1. From the Digital Sensor Information screen (Figure 19), press Enter to access the 4042 Digital Sensor Configuration/Add Channel screen.

Figure 19 4042 Sensor Digital Sensor Information screen


```
Digital(2)
Model:
4042-1-480505-0201
Serial = 31614385Ø
```

Figure 20 4042 Sensor Channel Configuration/Add Channel Screen


```
Channels   = 3
MinVSWR Alarm = 1.00
MaxVSWR Alarm = 2.00
Edit Channels?  No
```

Add Channel(s)

2. Press ENTER to scroll to the Edit Channels option (Figure 20). A Flashing Cursor indicates the currently selected option.
3. Use the UP or DOWN arrows to change the option to Yes. Then press Enter.
4. Press Enter on the ADD CHANNEL screen to add a channel. See Figure 21.
5. Press ENTER to scroll through the options.
6. Use the UP and DOWN arrows to change each selected option.

    - Freq Setting: Enter the frequency of the channel to monitor.

    - Bandwidth Setting: Select the bandwidth of the selected channel. Options are 6.25, 12.5 and 25 kHz.

    - PTT Setting: Push to Talk, the default option is DISABLE. Enabled options are OPEN or CLOSED logic.

    - PTT Index Setting: The option is used to assign rear panel terminal associated with the Digital Sensor being configured.

7. Press ENTER to save the channel's configuration.

- Press ENTER and repeat "Add Channel(s)", step 5 through step 7 to add additional channels (up to sixteen channels total).

- Press CANCEL to Exit Add Channel Menu.

NOTE

To enter VSWR limits, Forward Power Alarm, Edit, or remove a previously entered channel go to *.*

Figure 21   4042 Digital Sensor Configuration Process
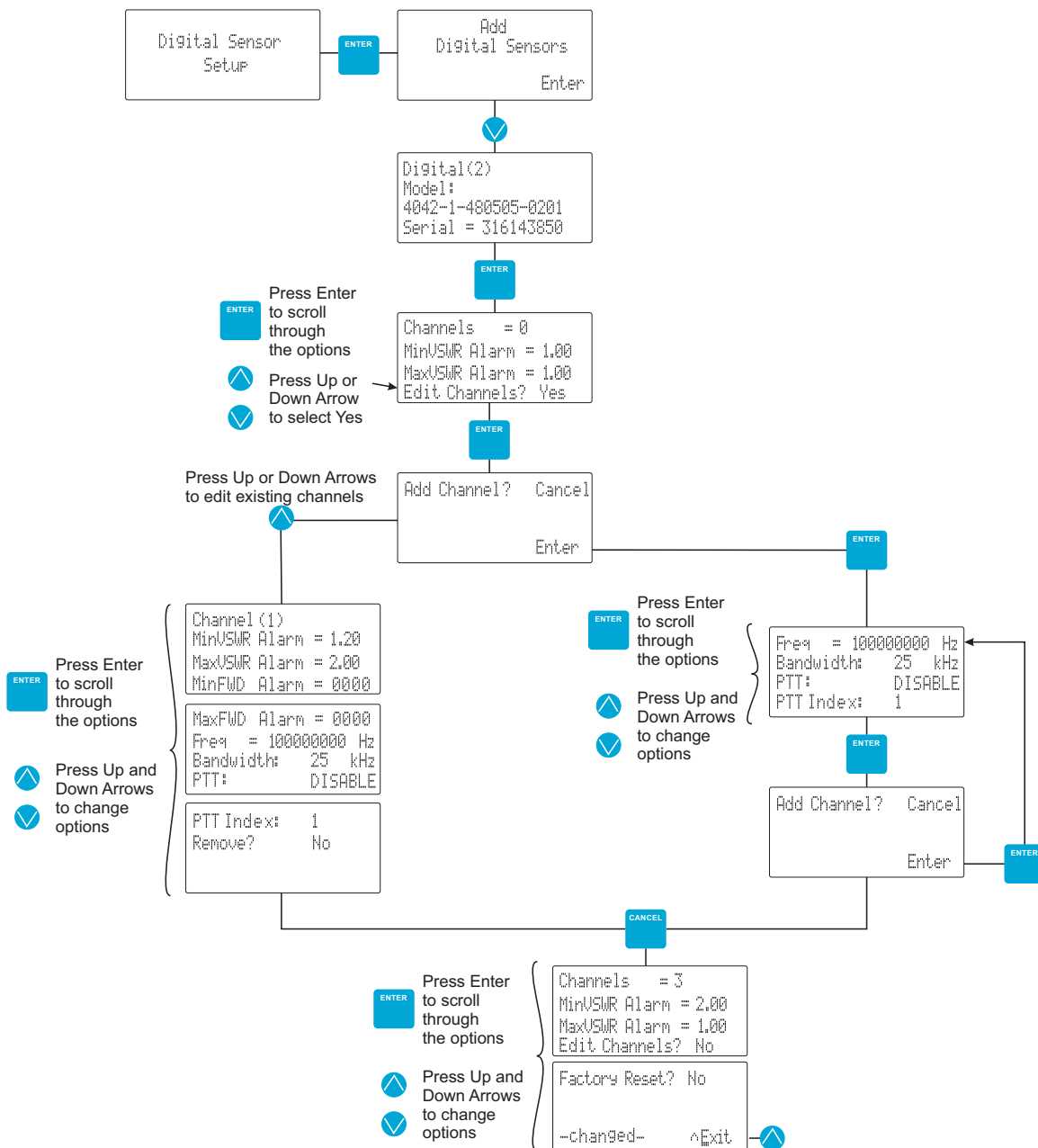
Configure MinVSWR and MaxVSWR Alarms for ALL CHANNELS in 4042 Sensor

NOTE

These VSWR settings are for ALL channels programmed into the 4042 Channel Sensor, to set VSWR for each channel see "Edit Channel(s)" on page 21.

8. From the 4042 Digital Sensor Configuration/Add Channel screen, press the UP or DOWN arrows to change the options, then press Enter for next option.

NOTE

Do not change the Edit Channels option, the default for this option is No and should remain No to complete 4042 sensor configuration.

- MinVSWR Alarm Setting: Lower limit VSWR measurement must reach to cause alarm condition. VSWR Alarm threshold may be set from 1.00 (no Alarm) to 9.99.

- MaxVSWR Setting: Upper limit VSWR measurement must reach to cause alarm condition.

- Factory Reset Setting: Resets the configuration of the sensor to the factory default settings.

  The Factory Reset option will "dis-enroll" the sensor from the CPM and reset the digital sensor to factory default settings.

NOTE

Exit command is only displayed after scrolling through all options.

9. Press UP arrow to exit configuration menu after the EXIT option is displayed.

Edit Channel(s)

10. Press ENTER to scroll to the Edit Channels option (Figure 20). An Flashing Cursor indicates the currently selected option.
11. Use the UP or DOWN arrows to change the option to Yes. Then press Enter.
12. Press UP or DOWN arrow on the ADD CHANNEL screen to EDIT channels. See Figure 21.
13. Press UP or DOWN arrow to select channel to EDIT. the Channel is indicated by (X).
14. Press ENTER to scroll through the options.
15. Use the UP and DOWN arrows to change each selected option.

- MinVSWR Alarm Setting: Lower limit VSWR measurement must reach to cause alarm condition. VSWR Alarm threshold may be set from 1.00 (no Alarm) to 9.99.

- MaxVSWR Setting: Upper limit VSWR measurement must reach to cause alarm condition.

- Min FWD Alarm Setting: Lower limit forward measured power must reach to cause alarm condition. The Forward Alarm threshold is a three digit number that can range from 000 to 999 Watts.

- Max FWD Alarm Setting: Upper limit forward measured power must reach to cause alarm condition.

- Freq Setting: Enter the frequency of the channel to monitor.

- Bandwidth Setting: Select the bandwidth of the selected channel. Options are 6.25, 12.5 and 25 kHz.

- PTT Setting: Push to Talk, the default option is DISABLE. Enabled options are OPEN or CLOSED logic.

- PTT Index Setting: The option is used to assign rear panel terminal associated with the Digital Sensor being configured.

- Remove option: Select Yes to remove the channel from the 4042 Channel Sensor.

16. Press CANCEL to Exit the Edit Channel Menu.

Digital Sensor Communication errors

Comm Time Out

If a digital sensor is disconnected from the CPM, or is unable to communicate, a **Comm Time Out (#)** message will be displayed, see Figure 22.

Figure 22   Comm Time Out

```
Comm Time Out(1)
Model:
4043-1-480505-0201
Serial = 163501438
```

Hit enter when the Comm Time Out screen is displayed. This will display a remove screen(Figure 23).

- To remove the sensor from the CPM's list of sensors, select Yes (press ENTER) to remove the sensor from the system.
- To keep the sensor in the CPM's list of sensors, select No (press CANCEL).

Figure 23   Remove Sensor Screen.

```
Remove?
Enter = Yes
Cancel = No
```

Comm Error

If more than one sensor with the same address is connected to a CPM at the same time a **Comm Error (#)** will be displayed, see Figure 24.

Figure 24   Comm Error

```
Comm Error(1)
Model:
4043-1-480505-0201
Serial = 163501438
```

1. Disconnect all the digital sensor except the sensor indicated in the Comm Error message by model and serial number.
2. Press ENTER on the front panel to display the remove sensor screen (Figure 23).
3. Press ENTER to remove the sensor from the CPM.
4. Reconnect all the other digital previously enrolled digital sensors.
5. Verify Comm Error is no longer displayed.
6. Add the sensor that was removed in step 3. See "Digital Sensor Enrollment" on page 16.

Analog Channel Setup

The Analog Sensor Setup screen (Figure 25) is used to initiate configuration of analog sensors connected to the CPM.

Figure 25   Analog Sensor Setup Menus
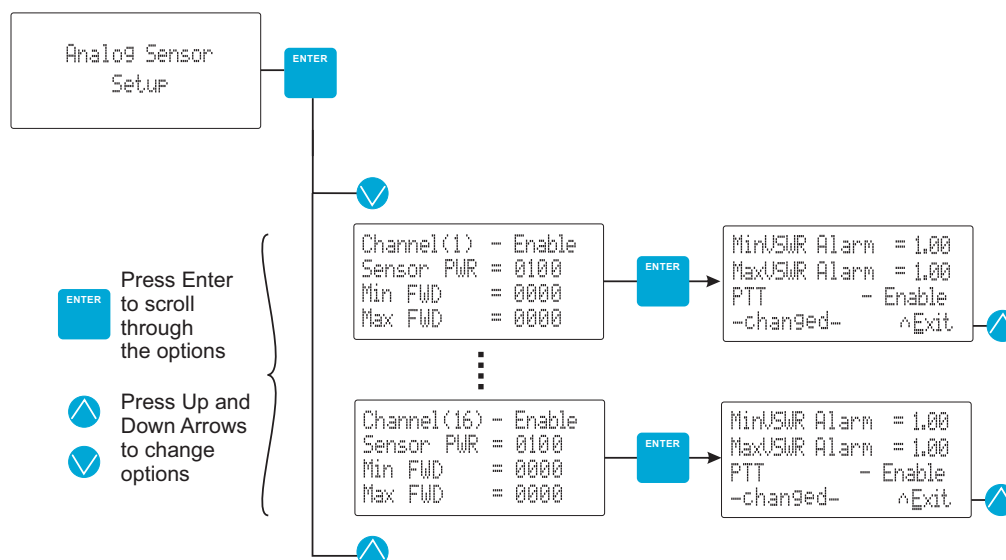
1. Press ENTER on the Analog Sensor Setup Screen to look at the setup of all sixteen analog channels.
2. Press the UP or DOWN Arrow buttons to select one of the 16 channels for setup.
3. Press the ENTER button

NOTE

The Analog Sensors configuration items are displayed on two screens as shown in Figure 25***.***

4. Press ENTER to scroll through the options. A Flashing Cursor indicates the currently selected option.
5. Use the UP and DOWN arrows to change each selected option.
    - Channel (X) Setting: enable or disable monitoring of a connected analog sensor.

    - Sensor PWR Setting: Enter the operating range of the power sensor that is attached to the displayed channel. The 4044 sensor is set to 125 (125 Watt non-directional). The 5009 sensors use Elements for measurement this setting should be set to the wattage rating for the forward Power Element.

    - MinFWD Alarm Setting: The lower limit forward RF power must reach to generate an alarm. MinFWD Alarm is a four digit number that can range from 0000 to 9999 Watts.

    - MaxFWD Alarm Setting: The upper limit forward RF power must reach to generate an alarm. MaxFWD Alarm is a four digit number that can range from 0000 to 9999 Watts.

    - MinVSWR Alarm Setting: Lower limit VSWR measurement must reach to cause alarm condition. VSWR Alarm threshold may be set from 1.00 (no Alarm) to 9.99.

    - MaxVSWR Setting: Upper limit VSWR measurement must reach to cause alarm condition.

    - PTT Setting: Push to Talk, the default option is DISABLE. Enabled options are OPEN or CLOSED logic.

NOTE

Exit command is only displayed after scrolling through all options.

6. Press UP arrow to exit configuration menu after the EXIT option is displayed.

Push-To-Talk (PTT)

When PTT is used (open or closed logic is chosen) the back panel push-to-talk terminals (see Figure 26) for the desired channel, must be in the correct logic state or all of the alarming notifications for that channel will be disabled. To summarize, this means that when the PTT feature is being used and is wired correctly and the transmit button is NOT engaged the alarms for that channel will NOT activate. This will prevent spurious alarms during periods when the transmitter is not transmitting because alarm functions for that channel will only be possible when the transmit button is engaged.

Bird recommends dry contact relays be used to couple the push-to-talk signal from the radios to the PTT terminals on the CPM. Such that the push-to talk function of the radio would energize the relay and the dry contacts of the relay would be connected to the appropriate input terminals on the rear of the CPM. This will ensure isolation between the equipment. Opto isolators are another good alternative worth consideration.

Figure 26   Rear Panel PTT Terminals
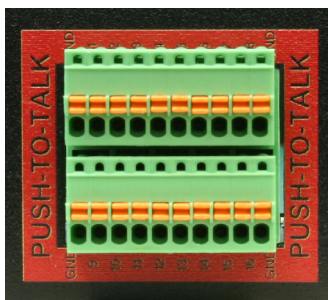
Analog Sensors Rear Panel Connections

PTT must be enabled on the analog sensor configuration menu. See "Analog Channel Setup" on page 23.

NOTE

For Analog Sensors the PTT connector pin corresponds to the connector the sensor RJ-25 plug is connected to on the rear panel.

- PTT pin for the channel of interest must be connected to any one of the four ground terminals on the Rear Panel PPT plug in order for alarming to be functional. The ground terminals are located in the four corners.

- The individual input pins are numbered to correspond with the RJ-25 Analog channel connector the sensor is connected to.

Digital Sensors Rear Panel Connections

PTT must be enabled on the Digital sensor configuration menu and a PTT Index number assigned. See "Digital Channel Setup" on page 15.

NOTE

For Digital Sensors the PTT connector pin corresponds to the PTT Index number selected during the digital sensors configuration.

- PTT pin for the channel of interest must be connected to any one of the four ground terminals on the Rear Panel PPT plug in order for alarming to be functional. The ground terminals are located in the four corners.

- The individual input pins are numbered to correspond with the PTT Index number selected during the digital sensors configuration.
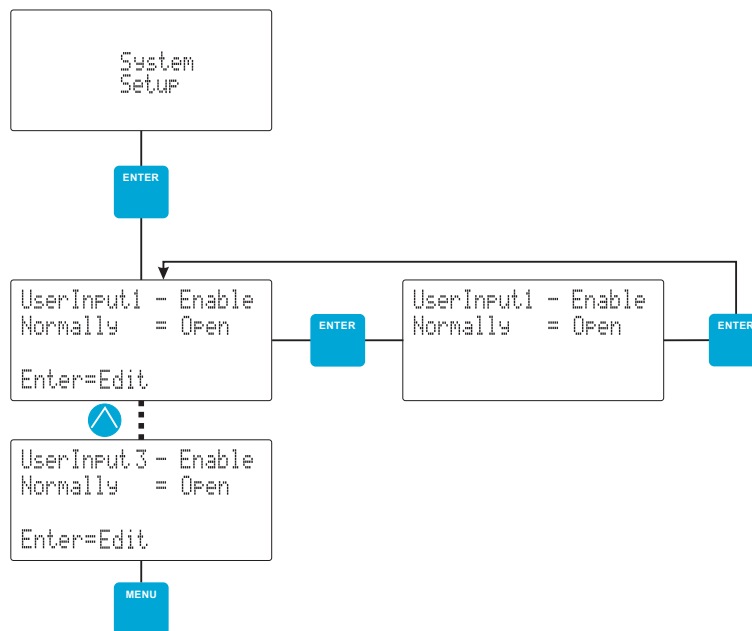
System Setup Options

User Defined Input Configuration

The CPM will generate an alarm whenever a user input (IN1, IN2, IN3) changes its relationship with its associated ground pin, see Figure 27. The user inputs can be programmed for normally open or normally closed operation. Note that normal operation is defined as the display unit powered up, operating as usual, with no alarms occurring. For the normally open configuration, no continuity between the user input and its associated ground would be the no alarm condition. To generate an alarm the users equipment would need to establish continuity between the user input and its associated ground.

Figure 27   User Input Terminals
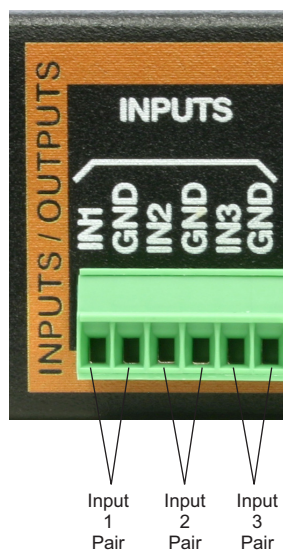
Likewise, the normally closed configuration would be the exact opposite. Continuity between the user input pin and its associated ground would be the no alarm condition. To generate an alarm the users equipment would need to break the continuity between the user input and its associated ground.

The user input configuration screen allows the customer to enable/disable the inputs and to configure the logic of the contacts by using the front panel buttons, see Figure 28. Note that when a user input is disabled it will not be scanned and any alarm triggering on the port is ignored.
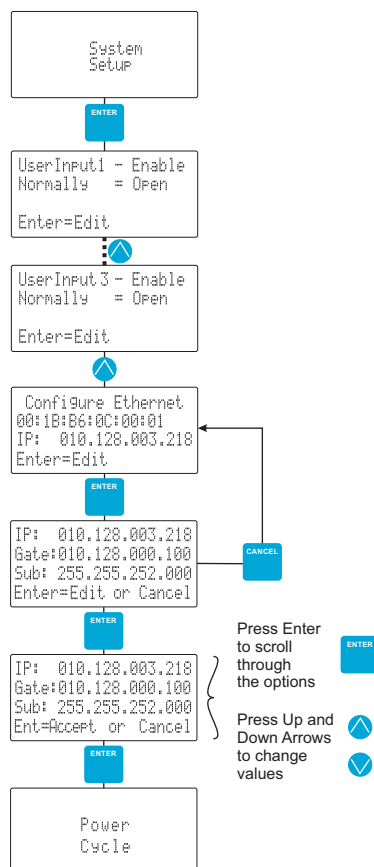
Figure 28   User Input Configuration Process

1. Press ENTER on the System Setup Screen to open the User Input 1 information screen.
    - Press the UP Arrow button to open the User Input 2 or 3 information screen.
2. Press ENTER to open the User Input configuration menu.
3. Press ENTER to scroll through the options. A Flashing Cursor indicates the currently selected option.
4. Use the UP and DOWN arrows to change each selected option.
5. Press ENTER to exit the User Input configuration menu.
6. Repeat step 2 through step 5 for any additional User Inputs connected to the CPM.

Ethernet Configuration

Ethernet settings that can be configured to include a Static IP address, Gateway address, and the Subnet Mask, see Figure 29.

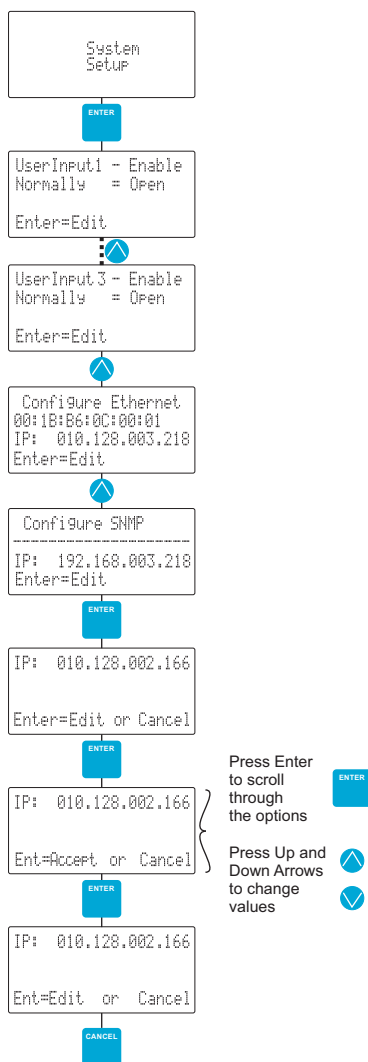*Figure 29   Ethernet Configuration Process Screen*

1. Press ENTER on the System Setup Screen to open the User Input 1 information screen.
2. Press the UP Arrow button until the Configure Ethernet Screen is displayed.
3. If changes are required, Press ENTER to open the configuration screen.
   c. Press ENTER to scroll through the options. A Flashing Cursor indicates the currently selected option.
   d. Use the UP/DOWN arrows to enter the IP address, Gateway and Subnet.
   e. Press ENTER to Accept the Address information.
4. Cycle power to the CPM.
5. Configuration is complete.

Configure SNMP

The user has the ability to configure the SNMP Interface for the power monitor. SNMP settings of the power monitoring unit which can be configured include the IP address. This value represents where the trap messages will be sent.

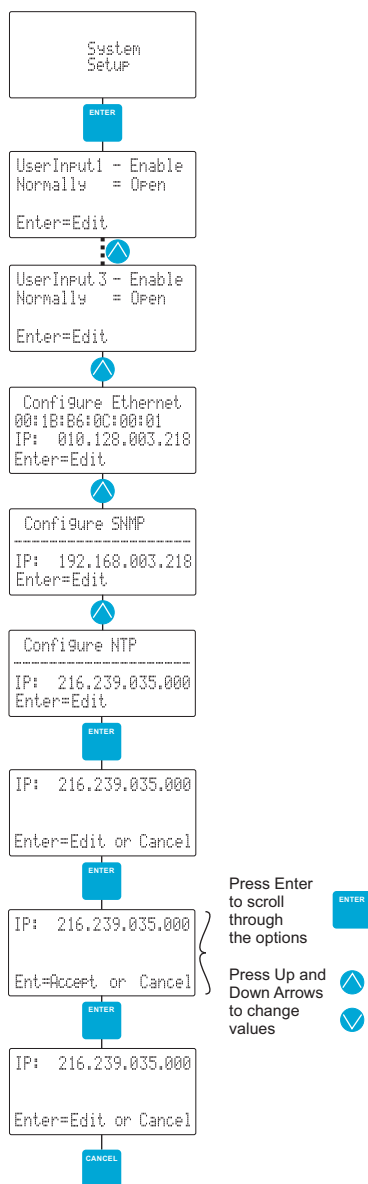*Figure 30   SNMP Configuration Process*

1. Press ENTER on the System Setup Screen to open the User Input 1 information screen.
2. Press the UP Arrow button until the Configure SNMP Screen is displayed.
3. If changes are required, Press ENTER to open the IP Address entry menu.
4. Press ENTER to edit the IP address.
5. Press ENTER to scroll through the options. A Flashing Cursor indicates the currently selected option.
6. Use the UP/DOWN arrows to enter the IP address.
7. Press ENTER to Accept the Address information.
8. Press CANCEL, then MENU twice to return to the Main Menu.

Configure NTP

The user has the ability to assign an NTP server for the power monitor to use as a time source. The NTP settings consist of entering an NTP server IP address.

Figure 31   NTP IP Address Configuration Process

```
        System
        Setup
         │
       [ENTER]
         │
 UserInput1 - Enable
 Normally   = Open

 Enter=Edit
         ⌃
 UserInput3 - Enable
 Normally   = Open

 Enter=Edit
         ⌃
 Configure Ethernet
 00:1B:B6:0C:00:01
 IP:  010.128.003.218
 Enter=Edit
         ⌃
 Configure SNMP
 ─────────────────
 IP:  192.168.003.218
 Enter=Edit
         ⌃
 Configure NTP
 ─────────────────
 IP:  216.239.035.000
 Enter=Edit
         │
       [ENTER]
         │
 IP:  216.239.035.000

 Enter=Edit or Cancel
         │
       [ENTER]
         │
 IP:  216.239.035.000

 Ent=Accept  or  Cancel
         │
       [ENTER]
         │
 IP:  216.239.035.000

 Enter=Edit or Cancel
         │
      [CANCEL]
```

Press Enter to scroll through the options [ENTER]
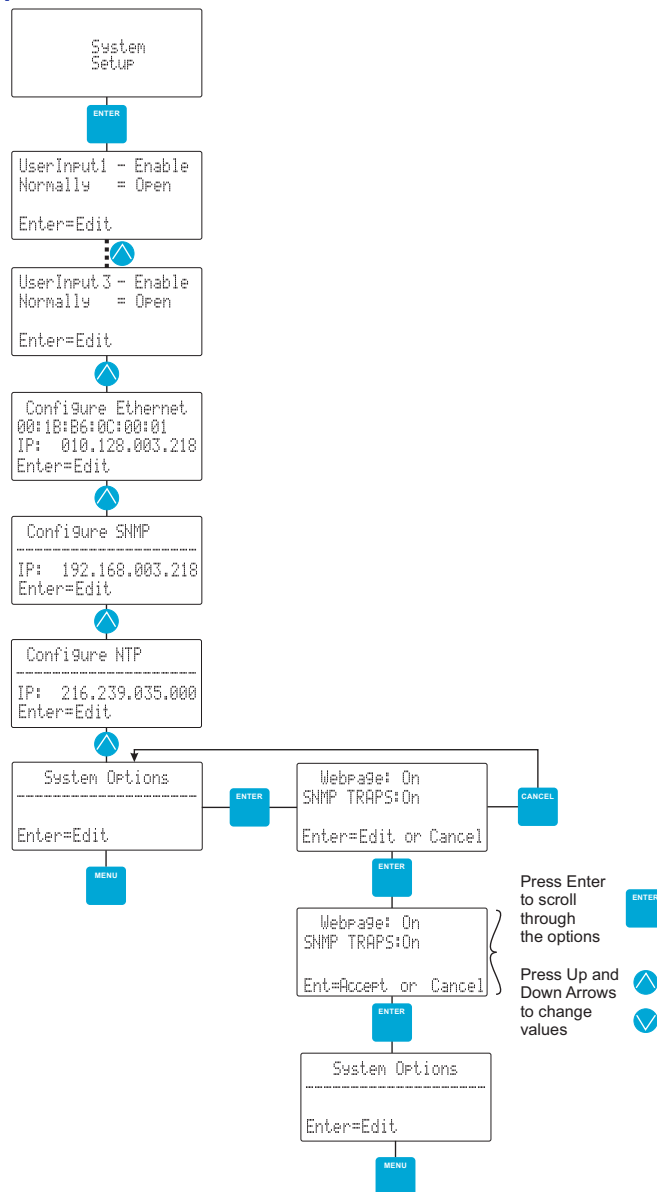
Press Up and Down Arrows to change values ⌃ ⌄

1. Press ENTER on the System Setup Screen to open the User Input 1 information screen.
2. Press the UP Arrow button until the Configure NTP Screen is displayed.
3. If changes are required, Press ENTER to open the IP Address entry menu.
4. Press ENTER to edit the IP address.
5. Press ENTER to scroll through the options. A Flashing Cursor indicates the currently selected option.
6. Use the UP/DOWN arrows to enter the IP address.
7. Press ENTER to Accept the Address information.
8. Press CANCEL, then MENU twice to return to the Main Menu.

System Options

System Options allows the web page interface to be turned on or off. Refer to <u>Figure 32</u>. When the Web page is off you cannot connect to the unit via the Ethernet.
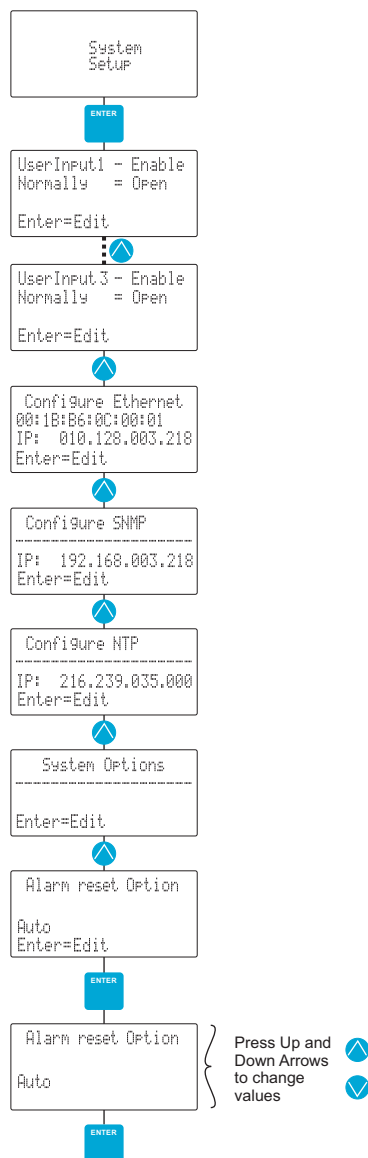
Figure 32   System Options Screen

1. Press ENTER on the System Setup Screen to open the User Input 1 information screen.
2. Press the UP Arrow button until the System Options Screen is displayed.
3. Press ENTER to open the System Options Configuration menu.
4. Press ENTER to edit.
5. Press ENTER to scroll through the options. A Flashing Cursor indicates the currently selected option.
6. Use the UP/DOWN arrows to change the options.
7. Press ENTER to Accept the changes.
8. Press MENU to return to the Main Menu.

Alarm Reset Options

The way the CPM resets alarms can be managed on the Alarm Reset Option Menu, see Figure 33. The system can be set to allow the CPM to automatically reset alarms or require alarms to be manually reset. In auto, once the condition that caused the alarm is corrected, the CPM will automatically reset the alarm. In manual, the alarm will remain active until manually reset, the condition that caused the alarm must corrected before a manual reset.

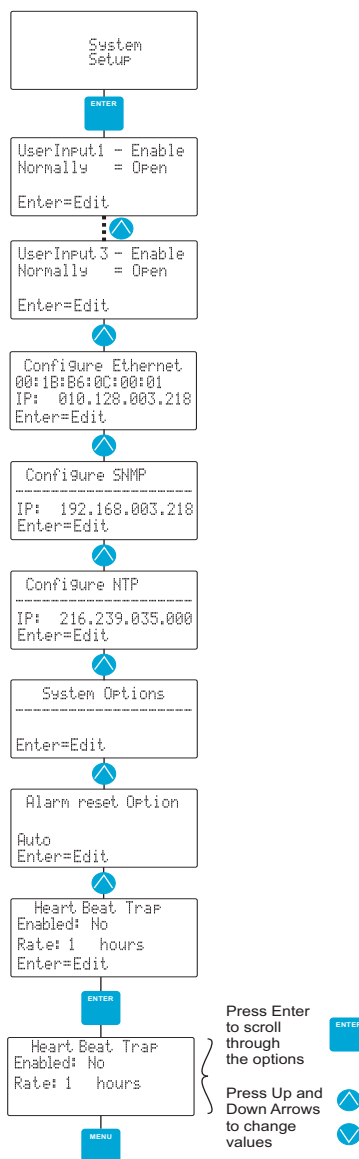*Figure 33   Alarm Reset Configuration Process*

1. Press ENTER on the System Setup Screen to open the User Input 1 information screen.
2. Press the UP Arrow button until the Alarm reset Options Screen is displayed.
3. Press ENTER to open the Alarm reset Options Configuration menu.
4. Press ENTER to edit.
5. Press use the UP or DOWN arrow to change the option.
6. Press ENTER to Accept the changes.
7. Press MENU to return to the Main Menu.

Heart Beat Trap

The Heart Beat Trap provides a way to ensure the CPM is operational. When turned on the CPM will send an SNMP message at a user selected interval. The Heart Beat Trap can be managed on the Heart Beat Trap Menu, see Figure 34. The Heart Beat Trap can be configured to send a trap at an intervals between 1-168 hours.

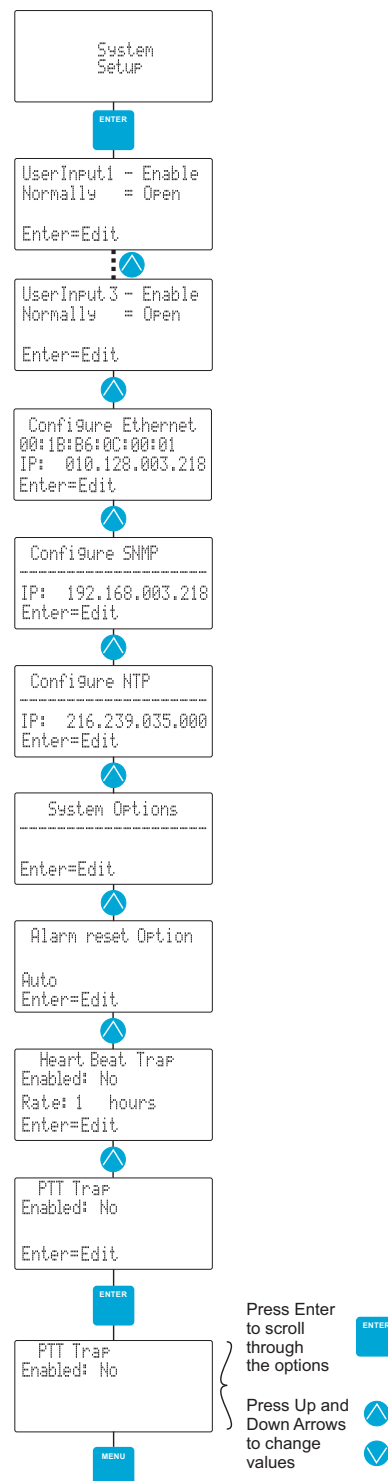*Figure 34   Heart Beat Trap Configuration Process*

1. Press ENTER on the System Setup Screen to open the User Input 1 information screen.
2. Press the UP Arrow button until the Heart Beat Trap Options Screen is displayed.
3. Press ENTER to open the Heart Beat Trap Configuration menu.
4. Press ENTER to scroll through the options. A Flashing Cursor indicates the currently selected option.
5. Use the UP/DOWN arrows to change the options.
   The rate may be set from 1 hour up to 168 hours.
6. Press ENTER to Accept the changes.
7. Press MENU to return to the Main Menu.

PTT Trap

The PTT Trap provides a way to notify the user when a PTT circuit goes active. When enabled, the CPM will send an SNMP message when a PTT circuit goes active. The PTT Trap can be managed on the PTT Trap Menu, see Figure 34.

*Figure 35   Heart Beat Trap Configuration Process*

1. Press ENTER on the System Setup Screen to open the User Input 1 information screen.
2. Press the UP Arrow button until the PTT Trap Options Screen is displayed.
3. Press ENTER to open the PTT Trap Configuration menu.
4. Press ENTER to scroll through the options. A Flashing Cursor indicates the currently selected option.
5. Use the UP/DOWN arrows to change the options.
6. Press ENTER to Accept the changes.
7. Press MENU to return to the Main Menu.

System
Setup

ENTER

UserInput1 - Enable
Normally   = Open

Enter=Edit

UserInput3 - Enable
Normally   = Open

Enter=Edit

Configure Ethernet
00:1B:B6:0C:00:01
IP: 010.128.003.218
Enter=Edit

Configure SNMP

IP: 192.168.003.218
Enter=Edit

Configure NTP

IP: 216.239.035.000
Enter=Edit

System Options

Enter=Edit

Alarm reset Option

Auto
Enter=Edit

Heart Beat Trap
Enabled: No
Rate: 1   hours
Enter=Edit

PTT Trap
Enabled: No

Enter=Edit

ENTER

PTT Trap
Enabled: No

MENU

Press Enter to scroll through the options

ENTER

Press Up and Down Arrows to change values

System Information

There are no customer interactions associated with this page. The Channel Power Monitor's current firmware version is displayed. Refer to .

Figure 36   System Information
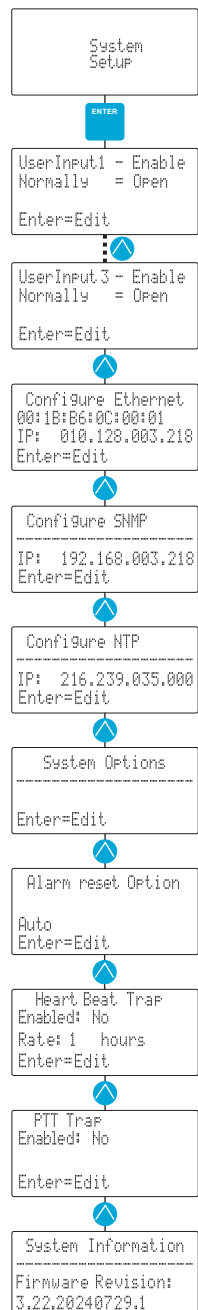
Scanning

The result of the CPM Scanning Mode can be viewed on the scanning mode display screens, see Figure 37. These screens are displayed when the power monitor is in its normal operating condition after installation and setup.

Pressing the Down Arrow repeatedly will cycle through the analog sensors forward, reverse and VSWR measurements for all the analog sensors.

> **NOTE**
>
> *Analog Channel reflected power can only be measured using the 5009 power sensor. This sensor has a measurement range determined by the Elements inserted in the sensor.*

After cycling through all analog sensor screens, continuing to press the down arrow will display a screen for each connected digital sensor. The screen for each digital sensor will display forward, reverse and VSWR measurements for that digital sensor. For 4042 Channel Sensors only, when the digital sensor is displayed in the scanning menu, pressing Enter will allow the display of each of the programmed channels, see Figure 37.

Figure 37   Analog Channel Scanning
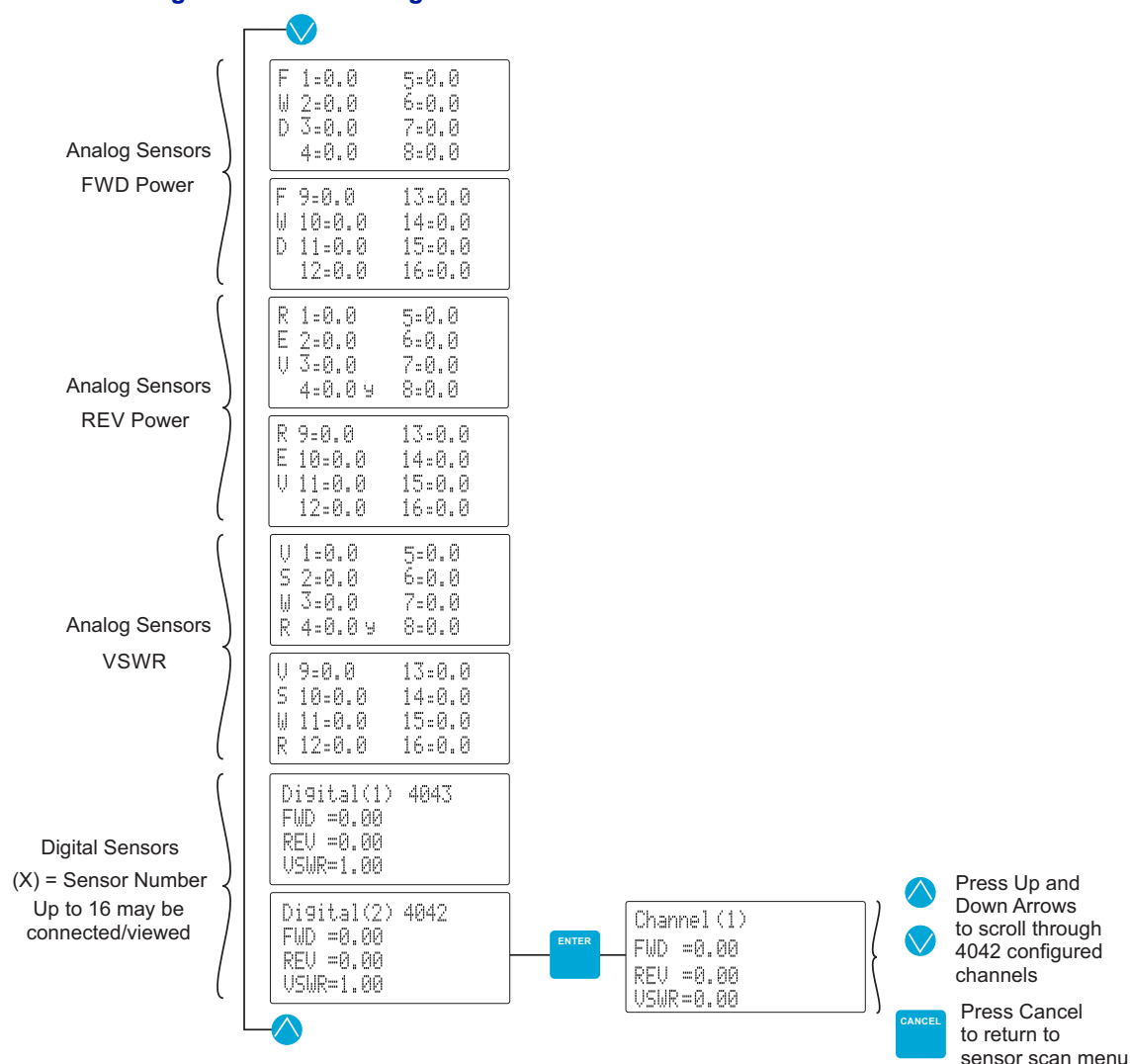
If the Web page is enabled it will be functional while scanning is operational. In addition, the front panel Scanning LED will illuminate only while in this mode of operation.

Alarm Contacts

A set of form-C alarm contacts are available at the rear of the unit as shown in Figure 38. During normal operation (display unit powered up, operating as usual, with no alarms occurring) continuity will exist between the center terminal and the left-most terminal. There will be no continuity between the center terminal and the right-most terminal. During an alarm condition the alarm contacts will change states. There will be no continuity between the center and left-most terminal and there will be continuity between the center and right-most terminal. Which is the exact opposite of the no alarm positions.

Figure 38   Rear Panel Alarm Contacts

SNMP Notifications

<div style="text-align:center">

NOTE

***Ensure a valid IP address for a SNMP trap receiver is setup and SNMP Traps are enabled.
This trap receiver needs to be on the same Subnet as the 3141.***

</div>

The SNMP feature is designed to provide reliable Internet notification of an alarm occurrence. Simple Network Management Protocol (SNMP) is an Internet standard protocol for managing devices on IP networks. If trap messages are enabled (see), a trap message will be sent to designated host computers whenever the CPM detects an alarm condition.

It is the customers responsibility to ensure the destination computer is running suitable trap receiver software. Bird provides MIB files for use with the customers chosen trap receiver software. These MIB files will allow the trap message to be properly decoded. The MIB files can be downloaded from the Bird website at; "www.birdrf.com".

A typical trap message has the following format:

<div style="text-align:center">

Channel_X type Alarm
X = channel number
Type = FRWD, VSWR, USER

</div>

So the trap message for a minimum forward power alarm event on channel 5 would appear as:

<div style="text-align:center">

Channel_5 FRWD Alarm

</div>

Table 1   SNMP Message Definitions

Name	OID	Message	Alarm/Clear	Description
MinVSWRAlarmTrap[1]	21581.5.1000.1	Site Name, Sensor Name, MinVSWR SetPoint, Forward Power, VSWR	"Alarm" when sensor state changes to an alarm state. "Clear" when sensor state changes from alarming to clear. Clear trap not sent if manually cleared.	Alarm that occurs when the VSWR is below the minimum VSWR set for a channel.
MaxVSWRAlarmTrap[1]	21581.5.1000.2	Site Name, Sensor Name, MaxVSWR SetPoint, Forward Power, VSWR	"Alarm" when sensor state changes to an alarm state. "Clear" when sensor state changes from alarming to clear. Clear trap not sent if manually cleared.	Alarm that occurs when the VSWR is above the maximum VSWR set for a channel.
MinFwdPowerAlarmTrap	21581.5.1000.3	Site Name, Sensor Name, MinFwdPower SetPoint, Forward Power, VSWR[2]	"Alarm" when sensor state changes to an alarm state. "Clear" when sensor state changes from alarming to clear. Clear trap not sent if manually cleared.	Alarm that occurs when the Forward Power is below the minimum power set for a channel.
MaxFwdPowerAlarmTrap	21581.5.1000.4	Site Name, Sensor Name, MaxFwdPower SetPoint, Forward Power, VSWR[2]	"Alarm" when sensor state changes to an alarm state. "Clear" when sensor state changes from alarming to clear. Clear trap not sent if manually cleared.	Alarm that occurs when the Forward Power is above the maximum power set for a channel.
PttTrap	21581.5.1000.5	Site Name, Sensor Name, Forward Power, VSWR[2]	N/A	Trap sent when PTT changes to active.
DigitalSensorCommError Trap	21581.5.1000.6	Site Name, Sensor Name	N/A	Trap sent when a digital sensor fails to respond. Continues to send while the sensor remains disconnected.
UserInputAlarmTrap	21581.5.1000.7	Site Name, Input Name	"Alarm" when input goes active. "Clear when input goes from active to inactive.	Alarm that occurs when one of the user input alarms is triggered.
HeartBeatTrap	21581.5.1000.8	Site name, Alive	N/A	Trap sent at a set interval to notify that system is running.

1 VSWR messages are only generated for directional power sensors.
2 VSWR values are only displayed when a directional power sensor is the source.

Web Page Interface

NOTE

The CPM must be in scanning mode to access the units web interface.

The power monitors web page feature allows the user to establish a convenient interface with the unit. The web page can be accessed either directly (on-site) via a laptop or remotely (off-site) via an Internet connection. The web page interface gives the user a detailed overview of all the channels in the system, the ability to label channels with custom labels, a graphical presentation of up to three parameters at a time, and a logging function.

Table View

Once you are properly connected the web page interface screen will appear in your web-browsers window. The default screen is the Table View page as shown in <u>Figure 39</u>.

Figure 39   Web Interface Table View Screen
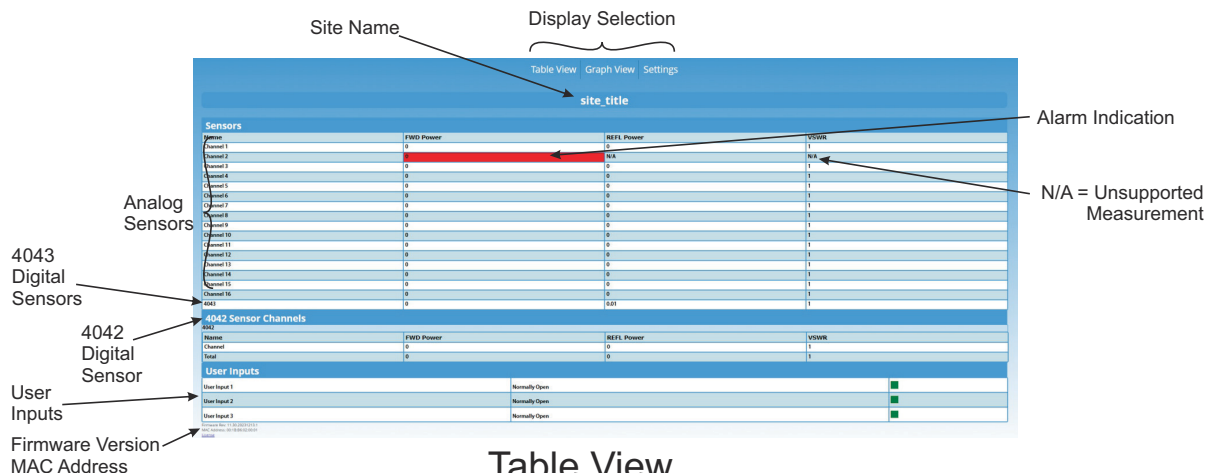
The Table View page shows all current values from the unit. If an alarm is triggered, the corresponding box will turn red. The forward and reflected power are shown in Watts. VSWR for each channel is also shown in the right most column. The user alarm inputs (1 through 3) are shown below the power values. The status (enabled or disabled) for each alarm input is shown and the contact logic (normally open or closed) is shown. An alarm condition is indicated by the OK green box changing into an ALARMED red box.

Graph View

The Graph page shown in <u>Figure 40</u> allows the user to display three different parameters on the graph at the same time. Each plot line is individually selected. Values that can be selected for display include the forward power, reflected power, or VSWR for any of the sixteen channels.

Figure 40   Web Page Interface graph display
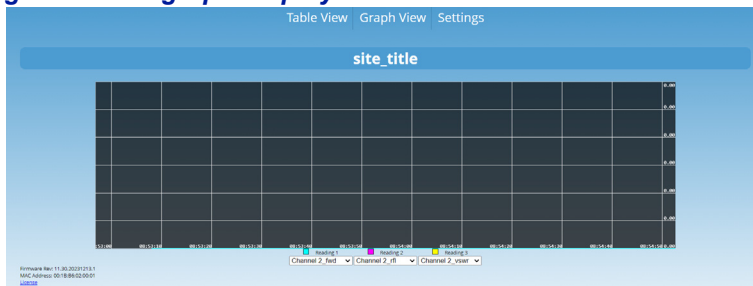
Settings page

The Settings page displays three settings Tabs; Analog, Digital, and System.

Analog Tab

Figure 41   Analog Settings

The Analog Tab allows the user to interact with the settings for the Analog Sensors.

- Click Save Settings to save any changes made to the Analog Settings.

Column	Contents
1	Descriptive name to be used for each channel. Click in the box and type in the desired descriptive label for the associated channel.
2	Monitoring of the individual analog sensors can be either enabled or disabled. A check mark in the box means enabled and no check mark means disabled.
3	Used to input the maximum power for the power sensor connected to each channel input. A value of 100 describes the directional sensor (model # 4044) and a directional sensor (model # 5009) will have a value of based on the Elements installed in the sensor.
4	Used to enable or disable the push-to-talk feature for each channel. Selection for each channel is made from a drop-down menu and includes the following choices; Disabled, Open, Closed. When PTT is enabled alarms will only be monitored when the PTT circuit is active (transmitting).
5 and 6	Setting the alarm threshold for Minimum and Maximum VSWR. Selection for each channel is made from a drop-down menu and includes the following choices; none, 1.25, 1.50, 1.75, and 2.00. When the VSWR alarm threshold is exceeded an alarm is triggered.
7 and 8	Setting the alarm threshold for Minimum and Maximum RF Power. Click on the box and type in the desired threshold value. A value of zero in this box means the alarm is disabled.

Digital Tab

Figure 42   Digital Settings

The Digital Tab allows the user to interact with the settings for the Digital Sensors.

- Click Save Settings to save any changes made to the Analog Settings.

4043 Sensor Settings

Column	*Contents*
1	Descriptive name to be used for each channel. Click in the box and type in the desired descriptive label for the associated channel.
2	Displays the model number of the digital sensor.
3	Displays the serial number of the digital sensor.
4 and 5	Setting the alarm threshold for Minimum and Maximum VSWR. Click in the box and type in the desired value for the VSWR alarm threshold from 0.00 to 9.99. Entering 0.0 disables VSWR monitoring. When the VSWR alarm threshold is exceeded an alarm is triggered.
6 and 7	Setting the alarm threshold for Minimum and Maximum forward RF power. Click on the box and type in the desired threshold value. A value of zero in this box means the alarm is disabled.
8	Enable or disable the push-to-talk feature. Selection is made from a drop-down menu and includes the following choices; Disabled, Open, Closed. When PTT is enabled alarms will only be monitored when the PTT circuit is active (transmitting).
9	Assign a PTT index number for the sensor. The PTT index number corresponds to the PIN numbers on the PTT connector on the rear panel of the CPM.
10	Used to Zero the digital sensor. Clicking on the Zero button will calibrate the sensor to the "zero signal" level. **Note:** *Remove RF Power from the digital sensor prior to zeroing the sensor.*

4042 Sensor Settings

NOTE

Only two 4042 sensors may be connected to a CPM.

NOTE

A maximum of 16 channels may be monitored by a single CPM, if more than one 4042 sensor is connected to a CPM, the available channels must be shared by the two 4042 sensors.

Top Row Column	Contents
1	Descriptive name to be used for each Sensor. Click in the box and type in the desired descriptive label for the associated Sensor.
2	Displays the model number of the digital sensor.
3	Displays the serial number of the digital sensor.
4 and 5	Sensor level VSWR settings. Setting the alarm threshold for Minimum and Maximum VSWR. Click in the box and type in the desired value for the VSWR alarm threshold from 0.00 to 9.99. Entering 0.0 disables VSWR monitoring. When the VSWR alarm threshold is exceeded an alarm is triggered.
6	Add Channel Button, adds a new Channel to the Sensor.

Channels Column	Contents
1	Descriptive name to be used for each channel. Click in the box and type in the desired descriptive label for the associated channel.
2 and 3	Channel level VSWR settings. Setting the alarm threshold for Minimum and Maximum VSWR. Click in the box and type in the desired value for the VSWR alarm threshold from 0.00 to 9.99. Entering 0.0 disables VSWR monitoring. When the VSWR alarm threshold is exceeded an alarm is triggered.
4 and 5	Setting the alarm threshold for Minimum and Maximum forward RF power. Click on the box and type in the desired threshold value. A value of zero in this box means the alarm is disabled.
6	Frequency of the channel in MHz.
7	Bandwidth of the channel. Selection is made from a drop-down menu and includes the following choices; 25 kHz, 12.5 kHz, 6 kHz.
8	Enable or disable the push-to-talk feature. Selection is made from a drop-down menu and includes the following choices; Disabled, Open, Closed. When PTT is enabled alarms will only be monitored when the PTT circuit is active (transmitting).
9	Assign a PTT index number for the sensor. The PTT index number corresponds to the PIN numbers on the PTT connector on the rear panel of the CPM.
10	Remove the Channel from the Sensor configuration.

System Configuration Tab

Figure 43   System Configuration

The System Configuration Tab allows the user to interact with the settings for SNMP settings, User Alarm I/O settings and setting a Site Name.

- Click Save Settings to program the CPM with the selected settings.

User Input Settings

Column	Contents
1	Descriptive name to be used for each input. Click in the box and type in the desired descriptive label for the associated input.
2	Enable or disable the user input. A check mark in the box means enabled and no check mark means disabled.
3	Shows the contact logic (normally open or closed) for each alarm input. Change the contacts logic by choosing from the drop down menu associated with each alarm.
4	Alarm indicator, indicator turns red when an alarm is active.

SNMP Traps

When checked, the CPM will send SNMP trap messages to the SNMP Target. When unchecked, SNMP Traps are not sent.

SNMP Target

SNMP settings can also changed from the settings page. The SNMP value that can be changed includes the IP address. This value represents where the trap messages will be sent. Click on the box and type in the desired value. Remember to press the Save Settings button to save your changes.

NTP Server IP

The Network Time Protocol (NTP) is used by hundreds of millions of computers and devices to synchronize their clocks over the Internet. The CPM may be configured to use a specific NTP server by entering the NTP Server's URL.

Site Name

A site name can be entered using the box in the lower right side of the display screen.

Logging

A logging function is available for use by the user. The log creates a file containing all the information from the main (default) screen. The logging schedule (when log entries are made to the file) is determined by the user using the drop down menu at the bottom of the page. Choices include not logging, log critical events, and log everything. The log file can be erased by pressing the delete log file button at the bottom of the page. When you want to examine the log file you must download it from the power monitor by pressing the Download Log File button.

NOTE

When you download the log file, be patient, it takes some time for the power monitor to format the data and transfer it to your computer.

Alarm Output Relay

Reset Alarm button is used to manually reset alarms once the cause is corrected, if Manual Reset option is selected.

Drop-down menu allows the user to select Auto Reset or Manual Reset for the reseting alarms.

Alarm Clear Trap is a trap that is sent out when an alarm condition is no longer present and the unit is on Alarm output auto reset. This trap works for all types of alarms (min fwd power alarm, VSWR alarm, user input alarm). There is no configuration available for this trap.

Heart Beat Trap

This option allows the user to send a trap at an interval between every 1-168 hours. Provides regular indication of CPMs operational status.

PTT Trap

When checked, the CPM will send PTT trap messages to the SNMP Target when PTT is activated. When unchecked, PTT Traps are not sent.

PTT Delay (ms)

This option is used to delay alarm reporting for a period of time after PTT is activated (transmitter active). If an alarm is detected when PTT is activated, the alarm will not be reported until the PTT delay and alarm delay time expires. If an alarm is detected after the PTT delay expires, the alarm will be reported immediately (subject to the Alarm Delay below).

Alarm Delay (ms)

Allows the user to enter an alarm reporting delay. The alarm delay setting will cause the CPM to delay the reporting of an analog or digital power sensor's alarm by at least the amount of time entered in the alarm delay.

Saving Settings

Any changes must be saved.

1. Click on Save Settings.

<div align="center">

NOTE

</div>

Saving settings can take up to one minute, do not attempt to refresh the page until the prompt indicating settings are updated is displayed.

2. A prompt will be displayed indicating the settings were updated. See .
3. Click OK on the prompt.

Figure 44   Save Settings Completed Messages
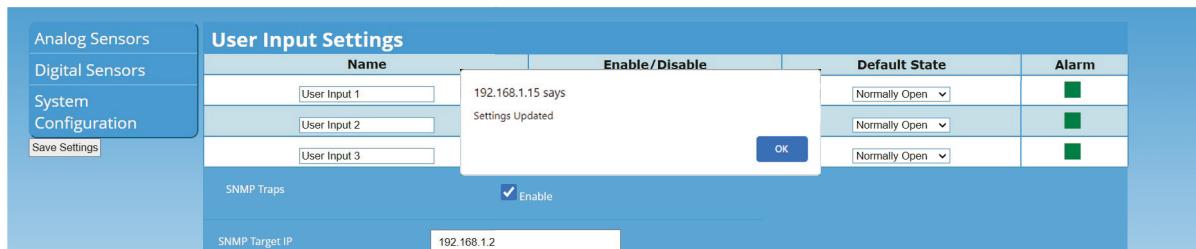
Deleting Logs

When Delete Log File is pressed and message is displayed to indicate the log file has been deleted.

Figure 45   Deleting Logs Completed Messages
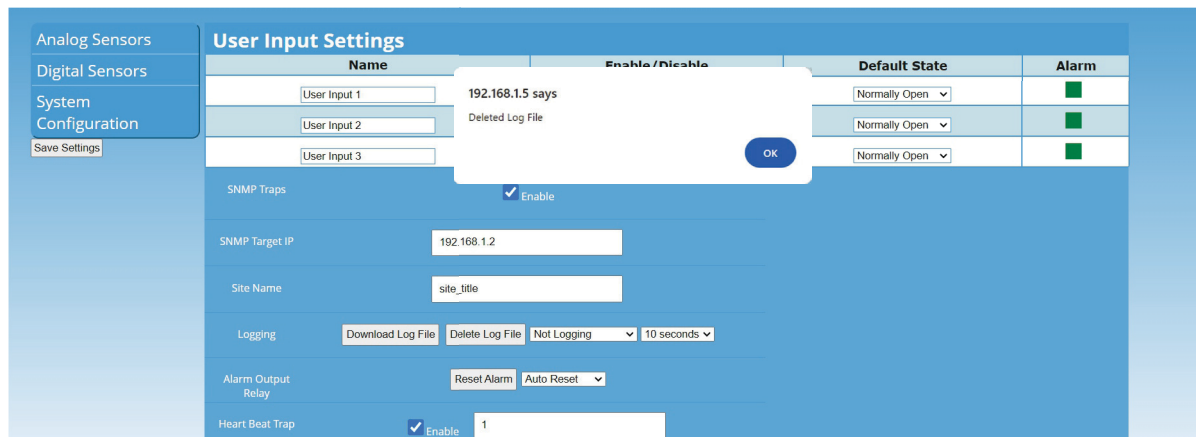
Customer Service

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 an Return Material Authorization (RMA) through the Bird Technologies website. 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
Fax: (440) 248-5426
E-mail: *bsc@birdrf.com*

For the location of the Sales Office nearest you, visit our Web site at:

http://www.birdrf.com

Firmware Update

The firmware used by the Bird CPM may be upgraded using the following procedure.

Required Equipment

- PC (Windows OS)
- CPM
- USB Cable
- Bird CPM Field Updater Utility

Download the Firmware

1. Go to http://www.birdrf.com/, search for 3141, or go to the Channel Power Monitor product page.
2. Check the "Downloads" section of the product page for the CPM Field Updater firmware package.
3. Click on the CPM Field Updater firmware update on the product page.
   The firmware ZIP file, will automatically download into the PC's downloads folder.
4. Right click on the ZIP file, and select Extract All.
5. Select a desired folder and click Extract on the pop-up dialog.

Install Bird CPM Field Updater Utility

1. Double Click on BirdCPMUpdater_Installer.exe to install the Bird Firmware Installation Utility on the PC.
2. If Microsoft Defender is displayed, click **More info**, then click **Run anyway**. See Figure 46.

Figure 46   Micrsoft Windows Defender

3. Follow the instructions on the Bird CPM Installer.
   If installing firmware on multiple CPM units, it is recommended to select **Create a desktop shortcut** during installation.

NOTE

***If the PC is NOT connected via USB to the CPM, deselect the Launch Bird CPM Updater check box
prior to clicking finish.
If the Launch Bird CPM Updater check box is selected prior to clicking finish, the CPM update
application will launch. If the PC is not connected to the CPM, the update application will close.***

4. Click Finish on the final installation dialog box.
    If Launch Bird CPM Updater check box is selected, connect USB cable to the PC and CPM prior to clicking finish.

Update the CPM

1. Connect one end of the USB cable to the PC.
2. Connect the other end of the USB cable to the CPM front panel.
3. Launch Bird CPM Updater.

Figure 47   Launch Firmware Updater
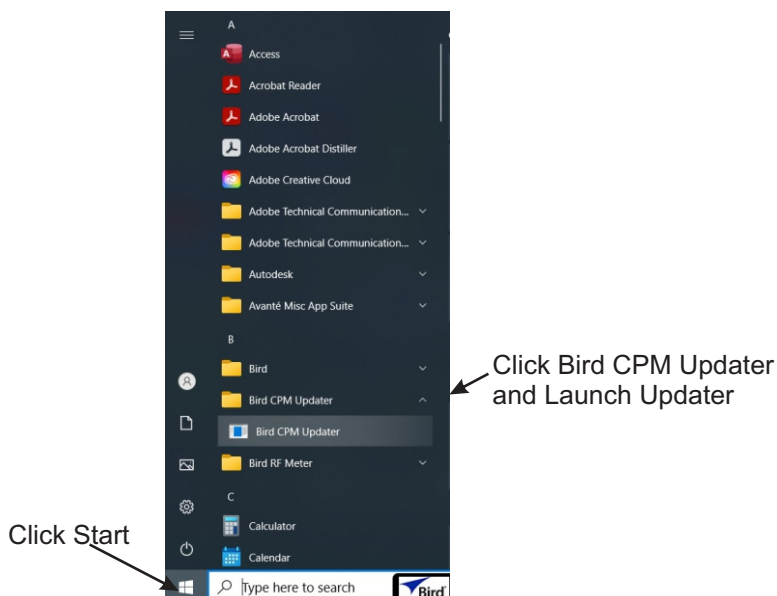
4. Monitor the installation progress in the installation window. See Figure 48.

Figure 48   Installation Window

5. The CPM will display the scanning screen after installation is complete.

CPM Specifications

3141A15

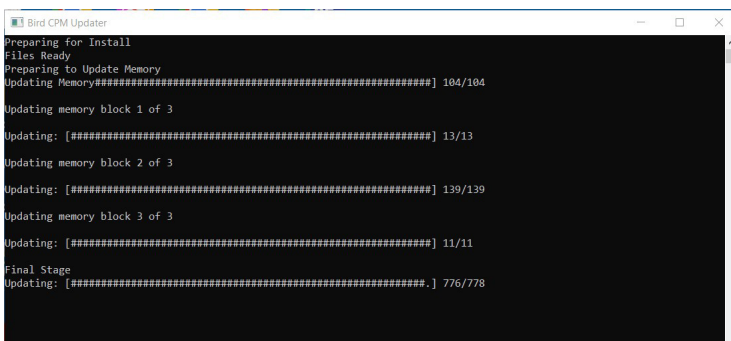| Specification	Value
Input Voltage	+ 15 VDC (supplied by 115/230 VAC Adapter)
Input Current	< 3 Amps
Fuse rating	5 Amp
Operating Voltage	15 VDC
Dimensions (D, W, H)	133.5 mm x 483 mm x 44.5 mm (5.25" x 19" x 1.75")
Weight	Approximately 2 lbs. (0.85 kg)
Operating Temperature	0° C to 50° C (32° F to 122° F)
Storage Temperature	-20° C to +80° C (-4° F to 176° F)
Humidity	95% +/- 5% max. (non condensing)
Altitude	up to 10,000 feet (3,048 m)

3141A48

Specification	Value
Input Voltage	± 48 VDC (+48 or -48)
Input Current	< 1 Amp
Fuse rating	1.25 Amp
Operating Voltage	15 VDC
Dimensions (D, W, H)	133.5 mm x 483 mm x 44.5 mm (5.25" x 19" x 1.75")
Weight	Approximately 2 lbs. (0.85 kg)
Operating Temperature	0° C to 50° C (32° F to 122° F)
Storage Temperature	-20° C to +80° C (-4° F to 176° F)
Humidity	95% +/- 5% max. (non condensing)
Altitude	up to 10,000 feet (3,048 m)

Channel Power Monitoring Performance Specification

The Channel Power Monitoring solution offers real-time RF power monitoring across multiple sensors. Below are the key performance expectations and limitations when capturing alarms via the web interface, particularly during simultaneous measurements.

Measurement Update Rate — Up to 2 readings per second per sensor; actual performance may vary with network conditions and sensor count.

Web Interface Latency — Optimized for updates within 1 second, though latency may increase as the number of sensors grows.

Alarm Capture — Alarms are reported within 2 seconds of detection, though performance can vary with system complexity.

Max Number of Channels — For optimal performance, limit each 3141 module to 8 channels when using 4042 and/or 4043 sensors. If using 4044 sensors exclusively, up to 16 channels can be configured.

Recommendations — Adhere to the recommended sensor limits for best performance. For larger setups, consult support.

Limitations and Recommendations

Performance Degradation — Exceeding the recommended sensor limits may result in slower updates and delayed alarms.

Recommendations

Keep the channel count within specified limits for optimal performance.

4042 Digital Power Sensor Specifications

Specification	Value
Measurement Type	In-Line, Directional RF True Average Power by Channel, or Composite Power (by scanning channels)
Channel Bandwidth	6.25, 12.5, 25 kHz selectable
Frequency Range	100 to 1000 MHz
Forward Power Measurement Range	Single Channel or Composite Forward Average Power 1 W to 50 W, 10 W to 500 W (model dependent)
Reflected Power Measurement Range	0.1W to 5W, 1W to 50W (model dependent)
RF Connectors 　　Input 　　Output	 Type-N (male) Type-N (female)
Impedance	50 Ohms nominal
Insertion Loss (Max.)	0.2 dB
Insertion VSWR (Max.)	1.15
Peak/Average Ratio (Max.)	12 dB
Directivity	25 dB minimum
Measurement Accuracy	± 5% of reading
Data Interfaces	RS-485 Serial Interface
RS-485 Data Interface Connector	RJ-25
Power Supply Requirements DC-RJ-25 Jack (CPM)	 7-18 VDC, < 200 mA
Operating Temperature Range	0° C to +50° C (32° F to 122° F)
Storage Temperature Range	-40° C to +80° C (-40° F to 176° F)
Humidity	95% maximum (non-condensing)
Altitude (Max.)	15,000 ft. (4572 m)
Weight (Approx.)	0.6 lb. (0.27 kg)
Dimensions, Nominal Without Connectors	5.2" L x 3.8" W x 1.4" H (132.0 mm x 96.5 mm x 35.5 mm)
Operating Position	Any

4043 Digital Power Sensor Specifications

Specification	Value
Freq Range by Model	
4043-1-420505-0201	118 MHz to 144 MHz
4043-1-440505-0201	144 MHz to 244 MHz
4043-1-450505-0201	380 MHz to 420 MHz
4043-1-460505-0201	450 MHz to 512 MHz
4043-1-470505-0201	762 MHz to 806 MHz
4043-1-480505-0201	806 MHz to 869 MHz
4043-1-490505-0201	896 MHz to 940 MHz
Forward Power Measurement Range	1W to 50W, 25W to 500W (model dependent)
Reflected Power Measurement Range	0.1W to 5W, 2.5W to 50W (model dependent)
RF Connectors	
Input	Type-N (male)
Output	Type-N (female)
Impedance	50 ohms nominal
Insertion Loss (Max.)	0.2 dB
Insertion VSWR (Max.)	1.15
Peak/Average Ratio (Max.)	12 dB
Directivity	25 dB minimum
Measurement Accuracy	± 5% of reading
Data Interfaces	RS-485 Serial Interface, Bluetooth[1]
RS-485 Data Interface Connector	RJ-25
Power Supply Requirements DC-RJ-25 Jack (CPM or External P.S.)	7-18 VDC, < 50 mA
Operating Temperature Range	0° C to +50° C (32° F to 122° F)
Storage Temperature Range	-40° C to +80° C (-40° F to 176° F)
Humidity	95% maximum (non-condensing)
Altitude (Max.)	15,000 ft. (4572 m)
Weight (Approx.)	0.5 lb. (0.27 kg)
Dimensions, Nominal Without Connectors	5.2 L x 3.8" W x 1.4" H (132.0 mm x 96.5 mm x 35.5 mm)
Operating Position	Any

1 This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation.

4044 Analog Power Sensor Specifications

Specification	Value

Freq Range by Model
    4044-1-420404-0201
    4044-1-440404-0201
    4044-1-450404-0201
    4044-1-460404-0201
    4044-1-470404-0201
    4044-1-480404-0201
    4044-1-490404-0201
	
	118 MHz to 144 MHz
	144 MHz to 244 MHz
	380 MHz to 420 MHz
	450 MHz to 512 MHz
	762 MHz to 806 MHz
	806 MHz to 869 MHz
	896 MHz to 940 MHz

Max Average Power	125 Watts
Dynamic Range	20 dB
Accuracy	+/- 5% of reading
Impedance	50 Ohm
Insertion Loss	< 0.1 dB
Insertion VSWR	< 1.10:1
Inter-modulation Distortion (PIM)	<- 145 dBc
Instrument Interface	0-4 VDC
RF Connectors	N(M) / N(F)
Power Supply	7/18 VDC < 50 mA
Operating Temperature	0 to 50°C
Dimensions	2.3" (58 mm) Wide x 2.2" (56 mm) Long x 1.7" (43 mm) High
Weight	0.3 lbs (0.14 kg)

5009 Analog Power Sensor Specifications

Specification	Value
Sensor Type	Thruline two-element line section
Elements	DPM elements ONLY Select two elements from the same series, with RFL power 1/10 of FWD power.
Frequency Range [1]	2 – 1000 MHz1
Average Power Measurements	
DPM Elements, Forward or Reflected Direction	
Power Measurement Range	0.1 W to 1 kW
Power Measurement Accuracy	± 5% of full scale average power (95% c.l.)
Match Measurement	

Match Range
      Return Loss
      Rho (ρ)
      VSWR
	
	0 to 20 dB
	0.1 to 1
	1.22 to 99.99

Uncertainty	Twice the Avg Power Uncertainty (Calculated from forward and reflected uncertainty)
Settling Time, Max	2.5 seconds
Impedance, Nominal	50 ohms
Insertion Loss, Max	0.05 dB up to 1 GHz
Input VSWR, Max.	1.05:1 up to 1 GHz
Directivity, Typical [1]	30 dB
RF Connectors	QC Type (N(F) normally supplied)
Interface Connector	RJ-25
Power Supply	From host instrument via interface cable
Mechanical Shock and Vibration	In accordance with MIL-PRF-28800F Class 3
CE	CE compliant. Refer to DOC for specific standards.
Recommended Calibration Interval	1 year
Temp, Operating	−10 to +50 °C (+14 to +122 °F)
Temp, Storage	−40 to +75 °C (−40 to +167 °F)
Humidity, Max	95% (non-condensing)
Altitude, Max	3,000 m (10,000 ft.)
Dimensions, Nominal	5.0" x 2.4" x 2.0" (130 x 60 x 50 mm)
Weight, Nominal	0.9 lb. (0.4 kg)

1 Exact value depends on element selected

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 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.