Model ASC300LW
Beacon Receiver
Instruction Manual
Rev. 351-4-0111

www.atlanticsat.com
www.beaconreceiver.net

Atlantic Satellite Corporation
259 Expressway Court
Virginia Beach, Virginia 23462
Phone: 757-318-3500
Fax: 757-318-7020

sales@atlanticsat.com
engineering@atlanticsat.com

Model ASC300LW
Beacon Receiver

Table of Contents **Pages**

Model ASC300LW
Beacon Receiver

1.0 Functional Description

The **Model ASC300LW Beacon Receiver** is a high performance unit that is designed to real time track the power density of a satellite beacon and output a DC voltage that is linearly proportional to the beacon power. The applications for the **ASC300LW** are for antenna step track controlling and uplink power control systems.

2.0 System Specifications:

Input Frequency	930 to 2300 MHz
Pre-detection Bandwidth	50 kHz
Input Level	-90 dBm, minimum; -30 dBm, maximum For full tracking range capability
Frequency Tuning	10 kHz Steps
Frequency Adjust	Front Panel or Remotely
AFC **(1)**	± 23 kHz
Threshold	<45 dB-Hz for acquisition
Input Impedance	75 Ohm
Input Connector	Type F female STD (N-type female optional)
Output Impedance	100 Ohm, single ended
Output Connector	Terminal plug and BNC Female
Tracking Response	0 to +10 VDC for a 20 dB input level change
System Level Adjust	0 to 60 dB, 0.5 dB steps
Frequency Stability	± 1.0 ppm
Frequency Reference	10 MHz (Internal)
Phase Noise	> 75 dB-Hz, 1 kHz from Carrier
Alarms	Unit Lock
Alarm Relay	Form-C
LNB Voltage	+18VDC, Switchable from rear panel, 300 ma, max.
M & C	RS-232 or RS-485, Switchable, from rear panel
M & C Connector	DB-9, Female
Streaming	DB-9, Female, **(optional)**
Ethernet Interface	RJ-45 Jack **(optional)**

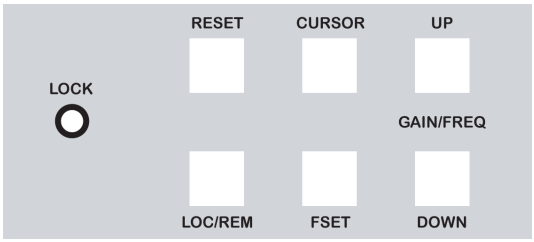
2.1 Physical Characteristics:

Size	1.75 “H X 16”D X 19”W
Weight	8 lb. (3.63 kg)
Primary Power	90-264VAC 47 – 63Hz, 1.4A

2.2 Environmental Specifications: Tested in accordance with MIL-STD-2164

Operating Temperature	0^0c to $+50^0$ c
Storage Temperature	-40^0c to $+70^0$ c
Humidity	95% RH@ 40^0 c

3.0 Front Panel Facilities



RES: Pressing the **RES (Reset)** button reboots the unit. The unit will retain the parameters of the previous settings.

LOC/REM: While depressing and holding the **LOC/REM** button and depressing and releasing the **RES** button, the unit will toggle between the local and remote mode of operation. In the local mode all parameters can be controlled from the front panel facilities. The remote **M&C** is not functional in the **LOCAL** mode of operation.

3.1 Local Operation

3.11 Changing Frequency

FSET: The **FSET** button activates the cursor. When depressed and released the cursors will blink over one of the frequency digits.

CURSOR: Depressing and releasing the **CURSOR** button will cause the cursor to move one frequency digit to the right. When the last digit is reached, the cursor will jump to the first frequency digit. When the desired digit is selected, the value of that digit may be changed.

UP: While in the **FSET** mode, the **UP** button increases the value of the selected frequency digit.

DOWN: While in the **FSET** mode the **DOWN** button decreases the value of the selected frequency digit.

When the desired frequency is selected depress and release the **FSET** button. The cursor will no longer be displayed and the unit will be tuned to the desired input frequency.

3.12 Changing Gain

When the unit is in the **LOCAL** mode of operation, the attenuation of the input signal level can be changed to accommodate the variations in the beacon input signal strength level. The attenuation is displayed in dB from 0 to 60 dB on 0.5 dB steps.

Once the unit has been tuned to the proper input frequency and the unit indicates that it has locked to that desired carrier then the signal strength the attenuation can be adjusted to achieve the desired operating signal strength voltage.

UP: The **UP** button increases the value of the attenuation of the unit. The maximum attenuation setting is 60 dB and is adjustable on 0.5 dB increments.

DOWN: The **DOWN** button decreases the value of the attenuation of the unit. The minimum attenuation setting is 0 dB and is adjustable on 0.5 dB increments.

Using the above procedure, and when the unit is locked to the desired carrier, adjust the gain such that the front panel signal strength indication displays +7.50 VDC. The unit tracks the input signal strength over a 20 dB range (0.5 V/dB). For a signal strength reading of +7.5 VDC, the unit will track upwards to +10.00 VDC or a +5 dB increase in input signal strength and downwards to 0.00 VDC or a –15 dB decrease in signal strength. The signal strength is not only displayed on the front panel but is also available for interfacing to external devices by utilizing the rear mounted terminal plug.

3.2 Display

The front panel display is a 2 x 20 VFD (vacuum fluorescent display). The display provides operating as well as alarm indication.

F: 930.00 to 2300.00 MHz on 10 kHz increments

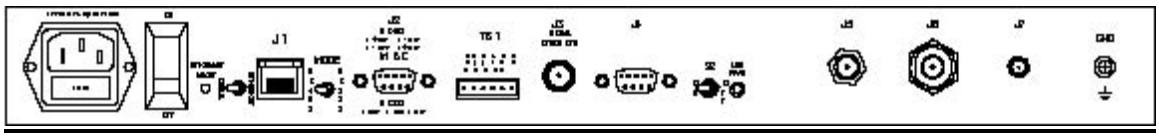
ATTEN: 0 to 60 dB on 0.5 dB steps.

REM: Displayed in the lower left corner when the unit is in the **REMOTE** mode of operation.

ALM: Continuously displayed if the unit is not locked to the carrier. The green **LOCK** front panel LED will not be lighted.

SS: The signal strength voltage is displayed in volts DC. The range that is displayed is 0.00 to +9.99 VDC. The normal optimum operating level is +7.50 VDC.

4.0 Rear Panel Facilities:



J1: RJ-45 (ETHERNET OPTIONAL) Not a standard install.

MODE: Selection switch for RS-232 or RS-485 external communication.

J2: M&C The monitor and control input is a female DB-9 connector. The pins for the appropriate interface are:

RS-232: Pin 2 – Transmit
Pin 3 – Receive
Pin 5 – Ground

RS-485 (optional):
Pin 6 – Transmit +
Pin 7 – Transmit -
Pin 8 – Receive –
Pin 9 – Receive +
Pin 5 – Ground

TB1:

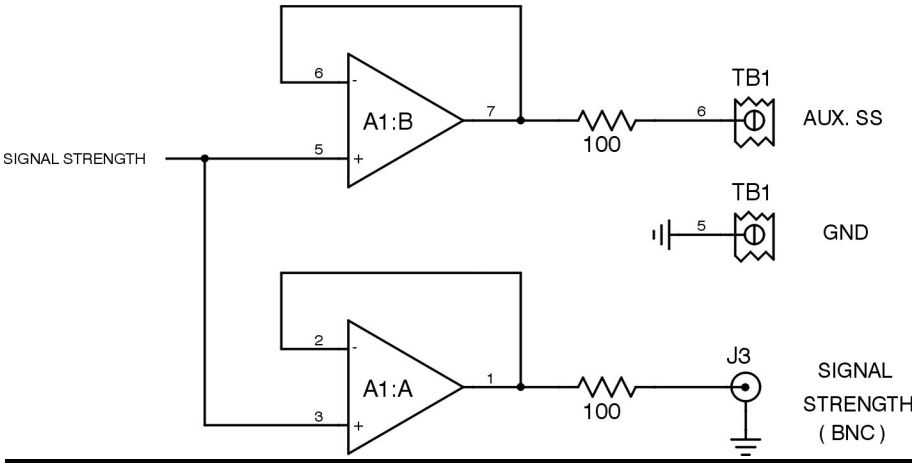
Term. 1: Alarm relay common contact
Term. 2: Alarm relay normally open contact
Term. 3: Alarm relay normally closed contact
Term. 4: AFC voltage. When the unit is locked to the carrier the voltage will be approx.2.05 VDC.
Term. 5: Signal Ground
Term. 6: Signal strength output voltage (SS)

J3: SIGNAL STRENGTH (BNC) The signal strength voltage ranges from 0 to + 10 VDC as a function of input signal level. The voltage slope is 0.5 V/dB over a 20 dB input signal change.

S2: LNB Voltage, +18 VDC, 500 ma, max., Switchable In/Out on input connector center conductor.

AC RECEPTACLE: 90-264 VAC, 47-63 Hz Input, auto-sensing. Spare fuse compartment within receptacle.\

SIGNAL STRENGTH OUTPUT CIRCUIT



J4: STREAMING (OPTIONAL) Not a standard install.

Refer to the attachment to the manual if this option is installed.

S2: (Not installed)

LNB PWR: +18 VDC, On/Off

LNB POWER LED: Red LED that is ON when power is applied to the LNB.

J5: INPUT The frequency input range is 930 to 2300 MHz with an input level range of –30 to –90 dBm per beacon carrier.

J5 Input: Type-F Female 75 ohm
J6 Input: 50 ohm, N-type, female connector, Optional
J7 Input: (SMA optional)

5.0 Serial Communications:

REMOTE OPERATION

Note: The unit must be placed in the remote mode of operation to perform any serial communication functions. Select the interface mode (RS-232 or RS-485) by placing the rear mounted mode switch in the appropriate position.

The unit can be remotely monitored and commanded by use of an RS-485, 4-wire, interface or an RS-232, 2-wire interface. The serial protocol is the same for both modes and is as follows:

2400 Baud, No parity, eight data bits, one stop bit
(2400,N,8,1)

The unit can be assigned a Hex address within the range of values of 1 Hex to F Hex. The assignment of the unit address is accomplished by the following sequence:

1. Place the unit in the **REM (remote)** mode of operation by depressing and holding the **LOC/REM** button and depressing and releasing the **RESET** button. The unit will toggle between the **LOCAL** and **REMOTE** mode of operation. When the **REMOTE** mode is selected, **REM** will be displayed in the lower left corner of the front panel display.
2. To select the address for the unit, press and release the **UP** or **DOWN** buttons until the desired address is selected in the range of **NO** or **1** to **F** where **NO** means that no unit addressing is required and **1** to **F** requires that the hexadecimal equivalent of the selected address must be sent to communicate with the unit.
3. The unit needs to be left in the **REM** mode of operation for external control of the unit.

To poll the unit for operating status when the unit is in addressing mode of **1** to **F**, transfer the following sequence:

ADDRESS (HEX) <space>0<space>0<space>0<space>

The unit will respond back with the current operating settings and alarm conditions

AD=address, F=f4f3f2f1.k2,k1, ATT=AT3,AT2 . AT1, SS=v2,v1.m1,m2

Where address is the hex value of the unit, f4f3f2f1 is the operating frequency in MHz, k2, k1 is the operating frequency in kHz, AT3, AT2, . AT1, is the attenuation setting in dB from 0.0 to 60.0, v2, v1,m1, m2 is the signal strength in volts from 9.99 to 0.00.

If an alarm condition exits, the unit is out of lock, and then the signal strength voltage will not be displayed and will be displaced with the word ALARM.

To change parameters of the unit transmit the following command string:

Address (Hex) <space>f4f3f2f1<space>k2k1<space>at3,at2,at1<space>

Where address is the Hex value of the assigned address, f4 is the most significant digit of frequency in MHz, k2 is the most significant digit in kHz, g3 is the most significant digit of gain. The range of frequency is 950.00 to 2300.00 and the range of attenuation is 0 to 600. If a frequency of less than 950 or greater than 2300 and/or an attenuation of greater than 600 or a least significant digit of a number other than 0 or 5 is transmitted then **?** will be transmitted back. The address, frequency in MHz and kHz and gain must be simultaneously transmitted. They cannot be transmitted independently.

The attenuation of the unit can be changed by transmitting any number from 0 to 600. The least significant digit must either be a 0 or a 5. 0 corresponds to 0.0 dB attenuation and 600 corresponds to 60.0 dB of attenuation. To change the attenuation by 0.5 dB, the least significant digit must be a 5. For example, to change the attenuation setting to 26.5 dB, the number string 265 must be transmitted.

An example to change frequency and attenuation is:

A (Hex) <space>1210<space>99<space>265<space>

The unit will change to 1210.99 MHz and an attenuation of 26.5 dB.

To poll the unit to see if the changes have been made transmit the following sequence;

A (Hex) <space>0<space>0<space>0<space>

The unit will echo back the following:

AD=A,F=1210.99,ATT=26.5,SS=(As determined)

If there was an alarm conditions the unit would echo back at the end of the response string the word **ALM**.

If the unit has **NO** selected as the address then no address is necessary as a preface to the serial commands.

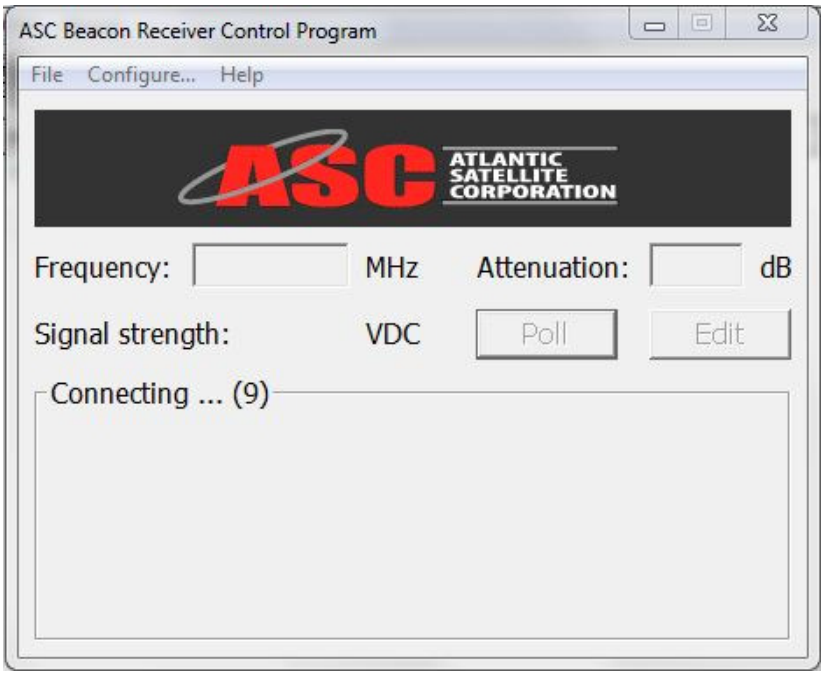
To poll the unit to see if the changes have been made transmit the following sequence;

0<space>0<space>0<space>

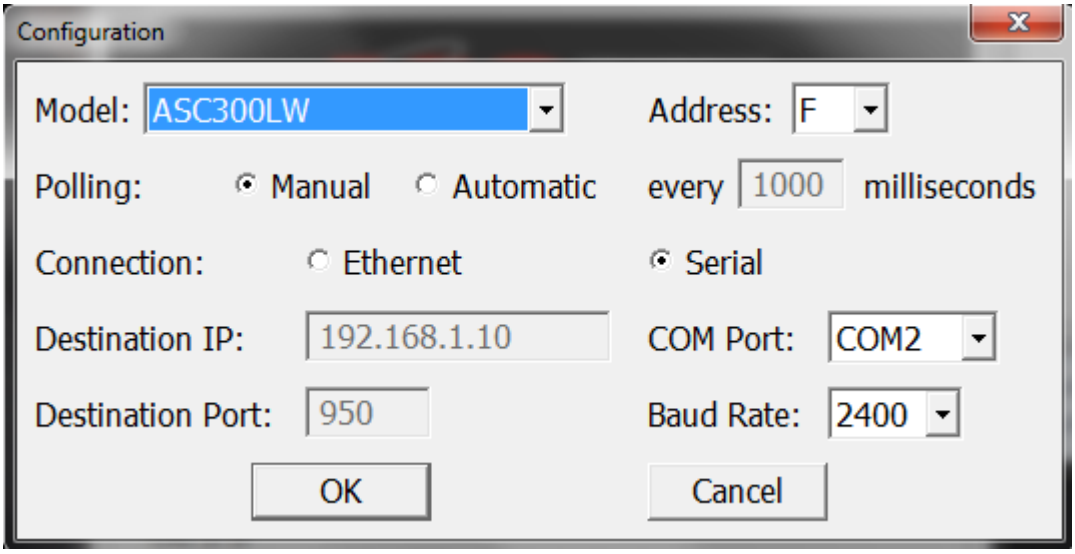
All other commands are the same as described above with the exception that the address character does not need to proceed the command structure.

6.0 ASC300 Series Using the ASC Simple User Interface Program:

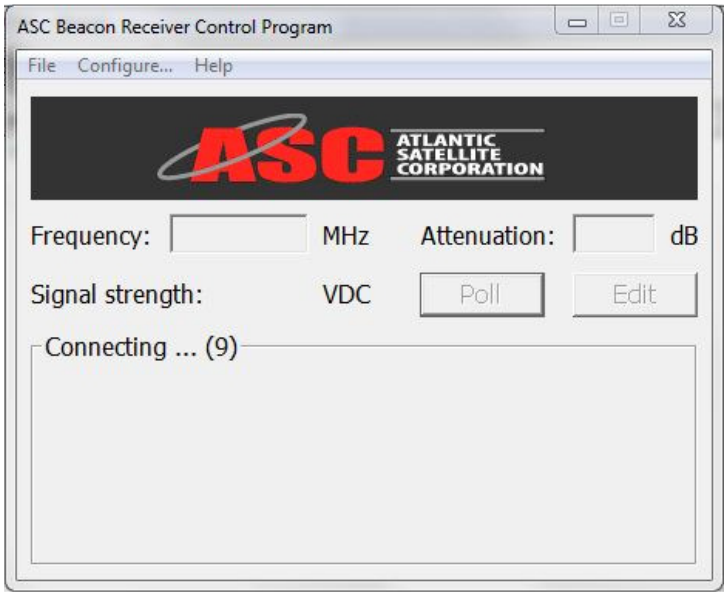
The **ASC300 series beacon receivers** can be remotely controlled and polled utilizing the included terminal program. Shown below are various screens that have been preset for communicating with the unit.



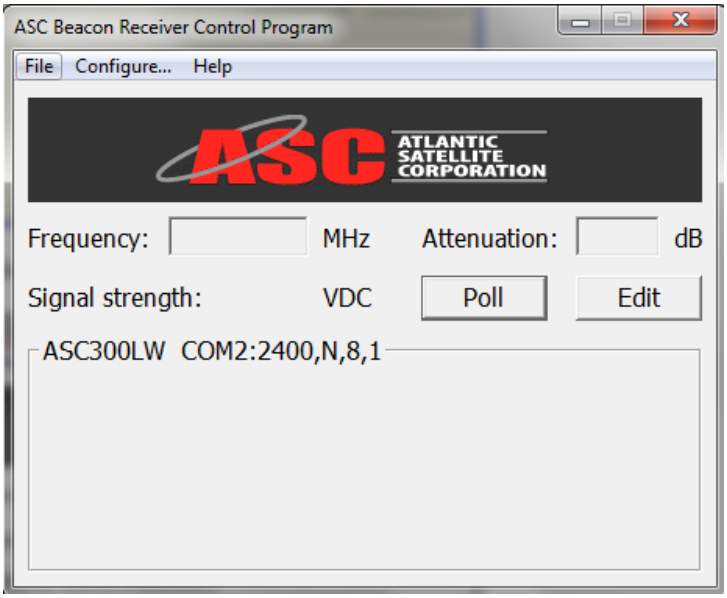
When you initially open the **ASC Beacon Receiver Control Program**, the above screen will appear. Click on **Configure** and the following screen will appear.



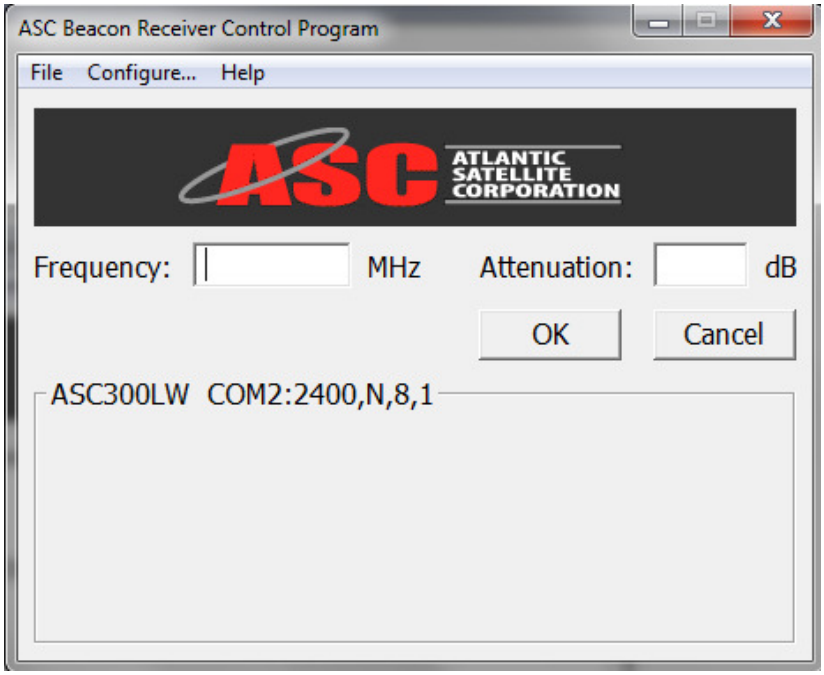
On the Model pull down screen select the model that you will be working with. In this case you will see that the model **ASC300LW** has been selected. You will also see that the baud rate has been set at **2400** and the **Address** has been set to **F**. **Note all other ASC300 series beacon receiver baud rates should be set to 2400.** Set the connection to **Serial**. Select the **COM Port** to be used. In this case the **COM2** has been selected. Note: if the Ethernet Options is installed you can also set the **Destination IP & Port** at this time. Click **OK**.
If the selected **Com port** is not supported then the following screen will appear.



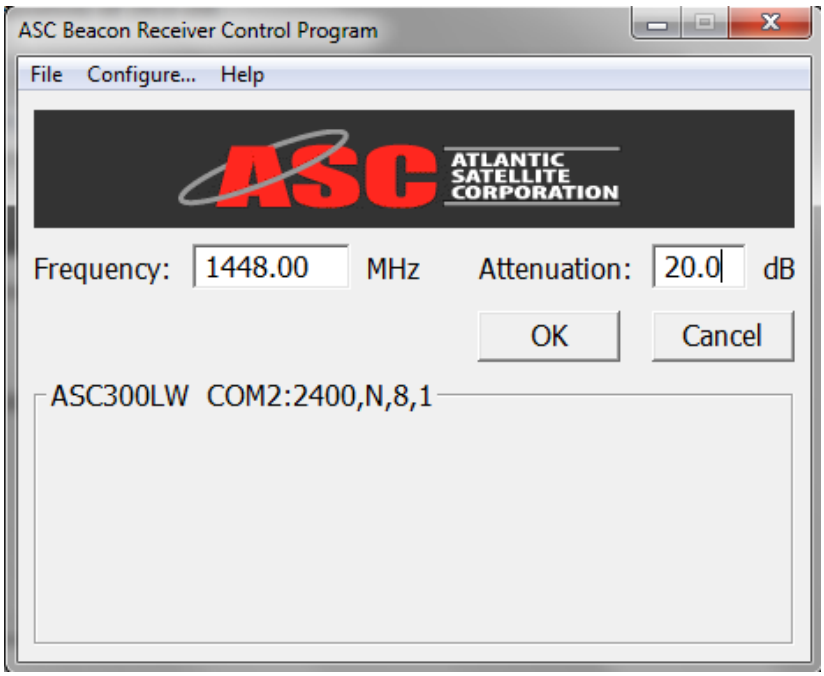
If the selected **Com port** is supported then the following screen will appear.



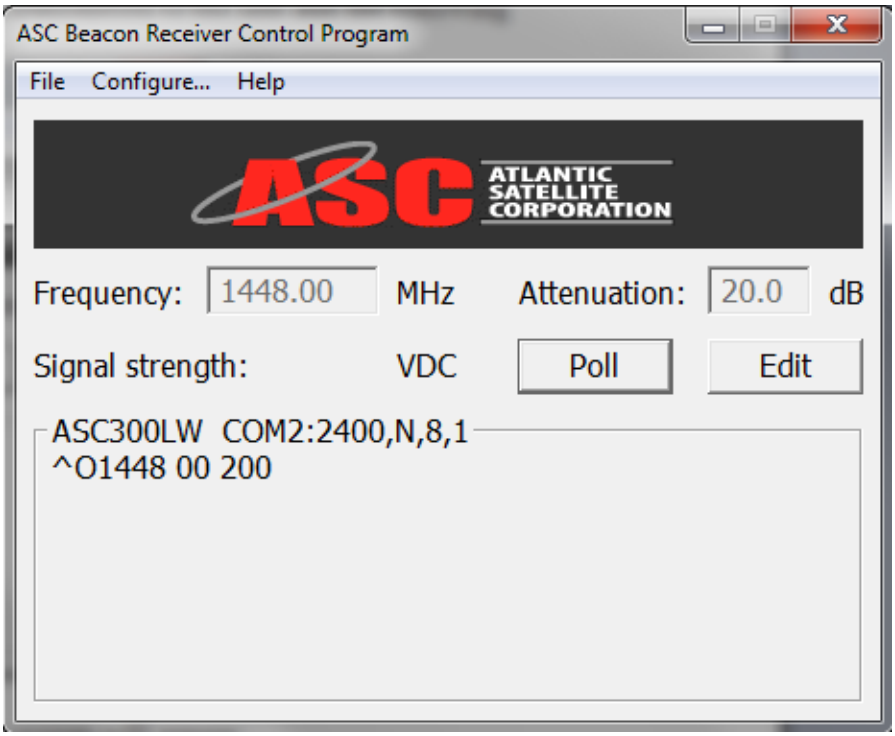
Click on the **Edit** button and the below screen will appear.



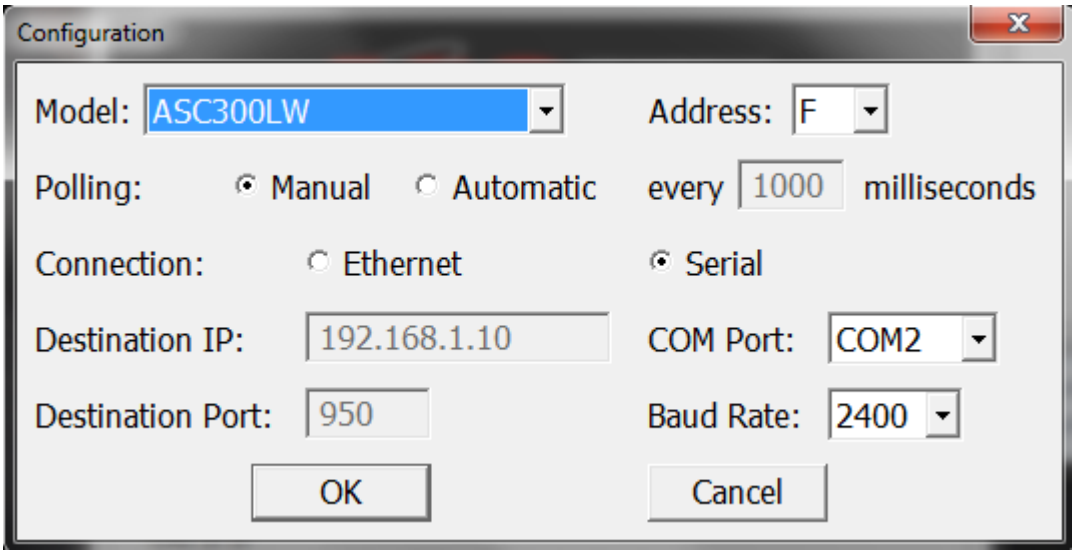
Enter the desired beacon frequency and attenuation for the unit in the appropriate boxes. The frequency range is from 930.00 to 2300.00 on 10 kHz steps. The attenuation range is 0.0 to 60.0 on 0.5 dB steps. It is recommended that the unit be initially set at an attenuation of 20.0 dB.



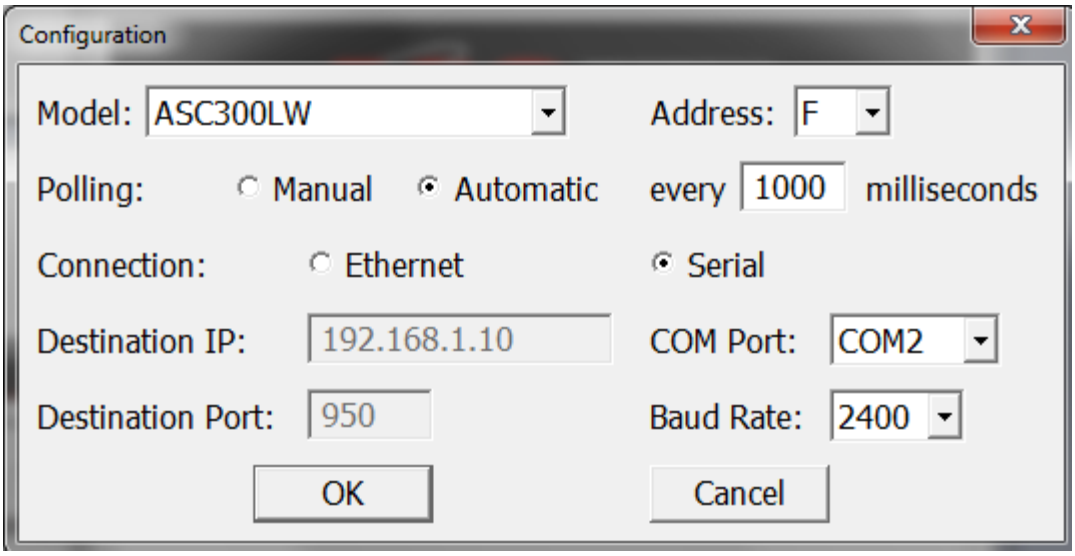
Click **OK** and the selected parameters will be transmitted to the unit and the following screen will appear.



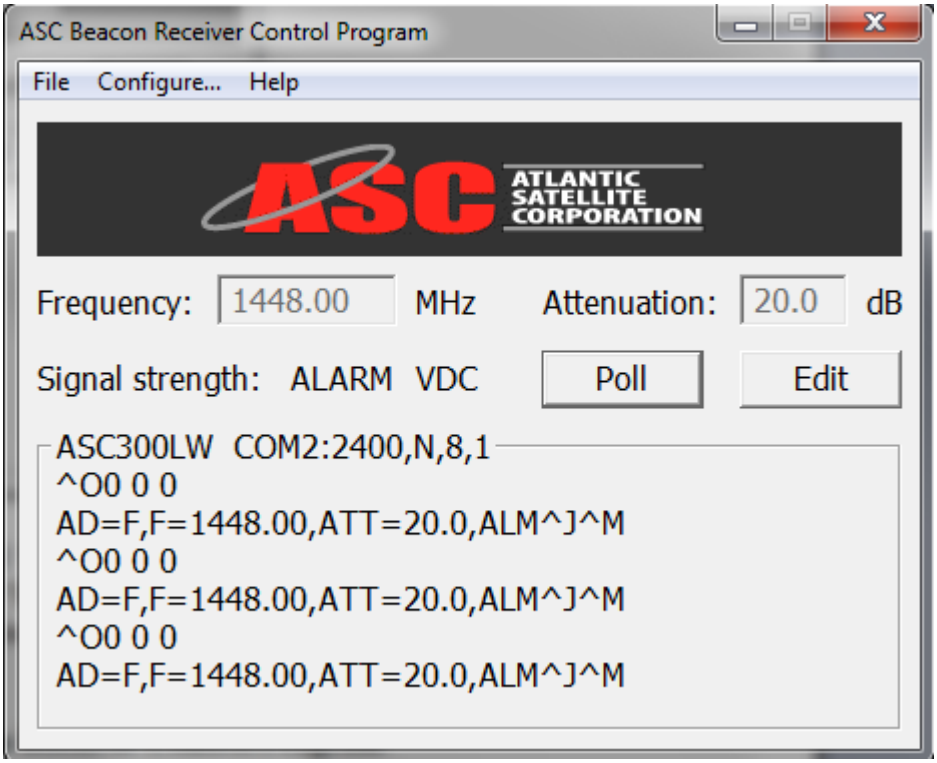
Select and click on **Configure**. The following screen will appear.



On the above screen the user can select that the unit can be polled manually by clicking the **POLL** button on the previous screen or can be selected to automatically poll by selecting **Automatic**. In the **Automatic** mode the polling time in milliseconds can be set by the user. **Do not use a polling rate of less than 300 milliseconds.**



Click **OK** and the following screen will appear.



In the above screen the transmitted command **^O 0 0 0,** the poll command, followed by the unit response. The trailing characters **^J^M** are the control characters for line feed and carriage return. The signal strength is separately displayed after the line **Signal strength:**

This completes the set up of the **ASC Beacon Receiver Control Program**.

7.0 Notice:

This publication and its contents are proprietary to Atlantic Satellite Corporation or *ASC* and intended solely for the contractual use of its customers for no other purpose than to install and operate the equipment described herein. This publication and its contents shall not be used or distributed for any other purpose and or communicated, disclosed, or reproduced in any way whatsoever without the prior written permission from Atlantic Satellite Corporation.

For the proper installation and operation of this equipment and or all parts thereof, the instructions in this guide must be strictly and explicitly followed by experienced personnel. All of the contents of this guide must be fully read and understood prior to installing or operating any of the equipment or parts thereof.

FAILURE TO COMPLETELY READ AND FULLY UNDERSTAND AND FOLLOW ALL OF THE CONTENTS OF THIS GUIDE PRIOR TO INSTALLING AND OR OPERATING THIS EQUIPMENT, OR PARTS THEROF, MAY RESULT IN DAMAGE TO THE EQUIPMENT, OR PARTS THEREOF, AND TO ANY PERSONS INSTALLING AND OR OPERATING THE SAME.

Atlantic Satellite Corporation does not assume any liability arising out of the application or use of any products, components parts, circuits, software, firmware described herein. Atlantic Satellite Corporation further does not convey any license under its trademark, copyright, or common-law rights nor the similar rights of others. Atlantic Satellite Corporation further reserves the right to make any changes in any products, or parts thereof, describe herein without notice.

Warning! Shock Hazard!

Do Not Open The Equipment! Service Only By ASC Personnel Only!

The Model ASC300LW contains no user-serviceable parts. Do not attempt to service this product yourself.

ANY ATTEMPT TO DO SO WILL NEGATE ANY AND ALL WARRANTIES.

8.0 Warranty:

Atlantic Satellite Corporations Warranty Policy ASC2006-05-20

Atlantic Satellite Corporation (ASC) (Seller) warrants the items manufactured and sold by ASC to be free of defects in material and workmanship for a period of two (2) years from date of shipment. ASC's obligation under its warranty is limited in accordance with the periods of time and all other conditions stated in all provisions of this warranty.
This warranty applies only to defects in material and workmanship in products manufactured by ASC. ASC makes no warranty whatsoever concerning products or accessories not of its manufacture. Repair, or at ASC's option, replacement of the ASC products or defective parts therein shall be the sole and exclusive remedy for all valid warranty claims.

Warranty Period
The applicable warranty period shall commence on the date of shipment from ASC's facility to the original purchaser and extend for the stated period following the date of shipment. Upon beginning of the applicable ASC warranty period, all customers' remedies shall be governed by the terms stated or referenced in this warranty. In-warranty repaired or replacement products or parts are warranted only for the remaining portion of the original warranty period applicable to the repaired or replaced products or parts. Repair or replacement of products or parts under warranty does not extend the original warranty period.

Warranty Coverage Limitations
The following are expressly ***not covered*** under warranty:
1. Any loss, damage and/or malfunction relating in any way to shipping, storage, accident, abuse, alteration, misuse, neglect, failure to use products under normal operating conditions, failure to use products according to any operating instructions provided by ASC, lack of routine care and maintenance as indicated in any operating maintenance instructions, or failure to use or take any proper precautions under the circumstances.
2. Products, items, parts, accessories, subassemblies, or components which are expendable in normal use or are of limited life, such as but not limited to, bulbs, fuses, lamps, glassware, etc. ASC reserves the right to revise the foregoing list of what is covered under this warranty.

Warranty Replacement and Adjustment
ASC will not make warranty adjustments for failures of products or parts, which occur after the specified maximum adjustment period. Unless otherwise agreed, failure shall be deemed to have occurred no more than seven (7) working days before the first date on which ASC receives a notice of failure. Under no circumstances shall any warranty exceed the period stated above unless expressly agreed to in writing by ASC.

Liability Limitations
This warranty is expressly in lieu of and excludes all other express and implied warranties, Including but not limited to warranties of merchantability and of fitness for particular purpose, use, or applications, and all other obligations or liabilities on the part of ASC, unless such other warranties, obligations, or liabilities are expressly agreed to in writing by ASC. All obligations of ASC under this warranty shall cease in the event its products or parts thereof have been subjected to accident, abuse, alteration, misuse or neglect, or which have not been operated and maintained in accordance with proper operating instructions. In no event shall ASC be liable for Incidental, consequential, special or resulting loss or damage of any kind howsoever caused. ASC's liability for damages shall not exceed the payment, if any, received by ASC for the unit or product or service furnished or to be furnished, as the case may be, which is the subject of claim or dispute. Statements made by any person, including representatives of ASC, which are inconsistent or in conflict with the terms of this warranty, shall not be binding upon ASC unless reduced to writing and approved by an officer of ASC.

9.0 Repair Service Policy:

Warranty Repair Return Procedure

Before a warranty repair can be accomplished, a Repair Authorization must be received. It is at this time that ASC will authorize the product or part to be returned to the ASC facility or if field repair will be accomplished. The Repair Authorization may be requested in writing, email or by calling:

Atlantic Satellite Corp.
259 Expressway Court
Virginia Beach, Virginia 23462 USA
T: 1-757-318-3500
rma@atlanticsat.com

Any product returned to ASC for examination must be sent prepaid via the means of transportation indicated as acceptable to ASC. Return Authorization Number must be clearly marked on the shipping label. Returned products or parts should be carefully packaged in the original container, if possible, and unless otherwise indicated, shipped to the above address.

Non-Warranty Repair

When a product is returned for any reason, Customer and its shipping agency shall be responsible for all damage resulting from improper packing and handling, and for loss in transit, not withstanding any defect or nonconformity in the product. By returning a product, the owner grants ASC permission to open and disassemble the product as required for evaluation. In all cases, ASC has sole responsibility for determining the cause and nature of failure, and ASC's determination with regard thereto shall be final.

10.0CE Declaration of Conformity:

We, the Manufacturer Atlantic Satellite Corporation at the following location:

Atlantic Satellite Corporation
259 Expressway Court
Virginia Beach, VA 23462

declares, that the following product:

Product Name: Beacon Receiver
Model Number: ASC300L ASC300L-D ASC300LW ASC300LW-D

The product complies with the requirements of the following Directives:

- LVD Directive 73/23/EEC (as amended by 92/C210/01 and 93/68/EEC)
- EMC Directive 89/336/EEC (as amended by 92/31/EEC and 93/68/EEC)

and conforms to the following standards:

- EN 60950:1992 +A1, A2, A3:1995 AND A4:1996
- EN 55022:1987 class A. sections 4 & 5
- EN 50082-1:1992 Part 1, commercial &light Industry
- IEC 801-2:1991, 4kV CD, 8kV AD
- IEC 801-3:1984, 3V/m
- IEC 801-4:1988, 2.0 kV Main, 1kV Signal & Control Lines

Warning notice:

- This equipment is intended for commercial and light industrial use only.
- This is a Class "A" product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

11.0 Continuous Digital Streaming 351L STREAMING

The streaming option associated with the ASC351L series of beacon tracking receivers provides a continuous data stream running at 9600 baud that contains signal strength level indication in centiVolts as well as lock or alarm condition of the unit. A dedicated DB-9 (J4), on the rear of theunit, provides the RS-232 streaming interface. The DB9, RS-232, pin out is:

Pin 2: serial output
Pin 5: ground

The protocol for the data stream is as follows:

9600,N,8,1

There is a 500 ms delay between transmissions.

The output data format is:

#(delimiter)1 or 0 (Lock or Alarm), space, followed by the signal strength voltage in centiVolts (cV).

As an example, for signal strength of 7.50 Volts and the unit locked the data string would be:

#1 750

If the unit is not locked the data string would be:

#0 0