Novra S75 Receiver User Manual

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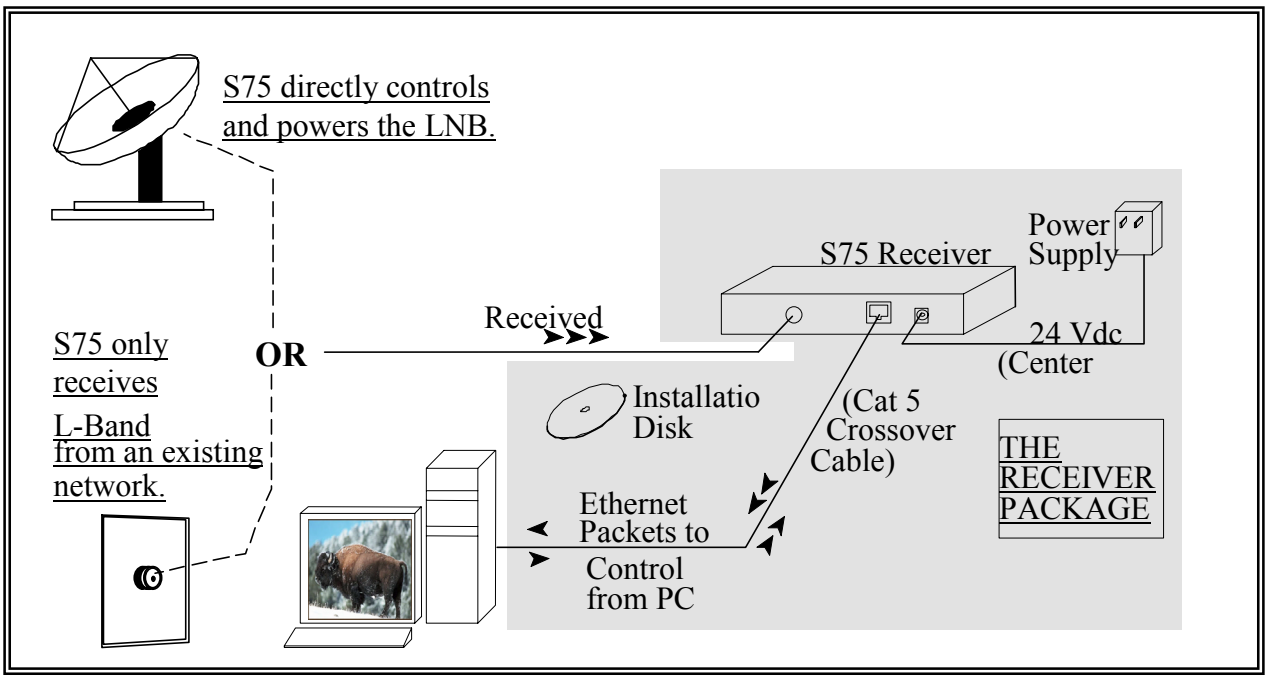

Note: These Files have been optimized for printing.

Novra S75 Receiver, User Manual

Subject to change without notification

Document version: 501D

Important- Please read this entire manual before installing or operating this product.

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Regulatory Compliance

Novra Technologies Inc. is in the process of gaining FCC certification for this device. This certification is not currently complete.

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Conventions

1.0 CONVENTIONS

NOTE: Information in this box will be Informative.

CAUTION: This information will be quite important and should not be ignored.

This symbol means that there are more notes on this topic located in the Appendix.

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2.0 INTRODUCTION

2.1 Principles of Operation

Somewhere in the world is a location that transmits your signal, along with many others, up to a satellite which turns around and transmits those signals back down to your location, and others. Your satellite dish catches all these signals, and the electronics at the dish converts them all into a group that travels down the cable to your S75 receiver. The S75 sifts through all the signals sent by the satellite looking for your signal (a DVB stream) and forwards to your computer the portion containing the signals you want. Your computer further dissects the signals and converts them into a format that is usable by other programs on your PC.

The S75 Management Console is used to configure addresses, specify satellite tuning parameters and select DVB information streams (PIDS). Once configured, the S75 will retain its settings and continue to forward data transmitted to you by your service provider even after restarting the S75 or your PC.

The S75 Receiver is meant to run in the background on your PC. In most cases, once the options have been set you will have no need to change them.

This area intentionally left blank

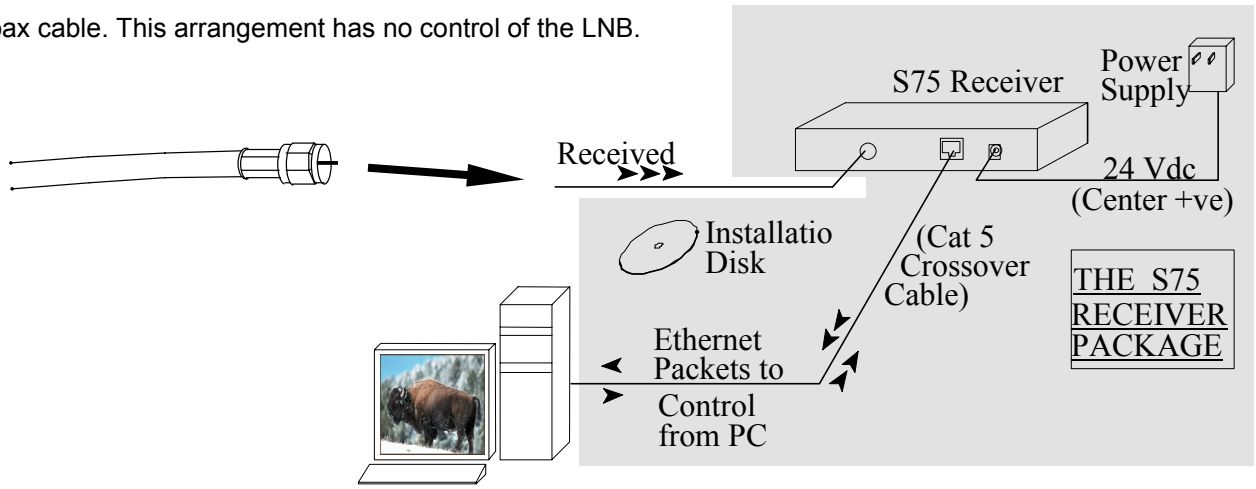
3.0 GETTING STARTED

3.1 Your Network Connection, is it Basic or Advanced ?

This step will determine what parts of the manual are relevant to your setup.

3.11 Basic

In this arrangement, someone else has already dealt with the satellite dish issues and distributed the signals so all that is required of you, is a connection to a coax cable. This arrangement has no control of the LNB.



If this is your setup, you have a **BASIC** connection.

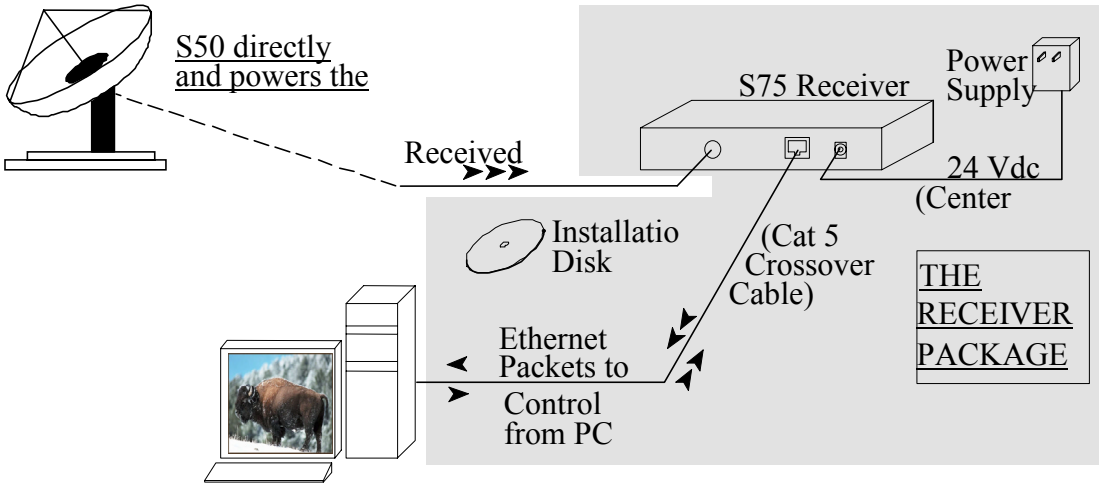
Please Proceed to **Required Information for Basic Connections.**

Your Network Connection, is it Basic or Advanced ?

(Continued)

3.12 Advanced

In this arrangement, the S75 is required to control and power the LNB at the satellite receiver dish.



If this is your setup, you have an **ADVANCED** connection.

> **CAUTION:** Nothing should be inserted between the S75 and the satellite dish except for a surge suppressor. Cable TV Splitters, TVs, VCRs, and FM receivers are not designed for connection to this portion of the network. They will not work and if they are connected, even for a brief moment, they will probably never work again because the power on the coax will destroy the input of the misplaced unit.

Please Proceed to **Required Information for Advanced Connections.**

3.2 Required Information for Basic Connections

NOTE: - This information is needed in order for the S75 to function. It is recommended that all the information be collected before attempting to install the service.

1) The L-Band Frequency _____ in MHz of the stream you wish to receive.
(Must be between 950 MHz and 2,150 MHz.)

2) The Symbol Rate in Msps. _____
examples 20.00000, 5.12600, 1.00000 etc.
This is a key component that must be supplied by your content service provider.

3) The channel designations, (Often called PIDs) for the signals you wish to receive. _____
examples 872, 1981, 445, etc.
This is a key component that must be supplied by your content service provider.

4) Novra S75 Receiver MAC Address (Found on the sticker on the bottom of the S75.)
example MAC: 12 - 34 - 56 - 78 - 90 - 12

5) The IP Address to be assigned to your Novra S75 Receiver by your network administrator.
example IP Address: 123 . 456 . 789 . 123

This information will need to be entered into the S75 after the software has been installed on your computer.

Please Proceed to Software Installation.

3.3 Required Information for Advanced Connections

NOTE: - This information is needed in order for the S75 to function. It is recommended that all the information be collected before attempting to install the service. Novra Technologies Inc. expects those end users who wish to control the LNB with the S75 receiver, already have at least a rudimentary understanding of satellite technology.

1) The L-Band Frequency _____ in MHz of the stream you wish to receive.
(Must be between 950 MHz and 2,150 MHz.)

This is the desired frequency to which the S75 is to tune. The range of frequencies can be from 950 MHz to 2,150 MHz. This range of frequencies is the result of the LNB conversion of the Satellite Frequencies.

for Ku Band Satellite reception (10.7 to 12.75 GHz);

"Satellite Frequency" - "Local Oscillator" = "L-Band Frequency"

for C Band Satellite reception (3.4 to 4.2 GHz);

"Local Oscillator" - "Satellite Frequency" = "L-Band Frequency"

NOTE: - Note: Local Oscillator Frequency is specific to the LNB Model and is usually stamped on the Unit or can be found in the LNB Manual. Typical values include 9.75, 10.60, 10.75, 11.00 and 11.25 GHz for the Ku band and 5.15 GHz for the C Band of satellite frequencies.

2) Polarization: Vertical / Right ____(+18 Volts) **OR** Horizontal / Left _____(+13 Volts)
If the LNB does not have the ability to switch polarizations, choose a value that will provide the most suitable power supply voltage. In most cases this will be Vertical / Right __√__(+18 Volts).
(Vertical and Horizontal are terms used for Linear Polarized systems.)
(Right and Left are terms used for Circularly Polarized systems.)

3) Will the S75 be controlling a Single Band LNB (Most Common) or a Universal Band / Dual LNB?
(The single band LNB has only one Local Oscillator while the Universal has two Local Oscillators that can be remotely selected by the S75.)

4) The Symbol Rate in Msps. _____
examples 20.00000, 5.12600, 1.00000 etc.
This is a key component that must be supplied by your content service provider.

5) The channel designations, (Often called PIDs) for the signals you wish to receive. _____
examples 872, 1981, 445, etc.
This is a key component that must be supplied by your content service provider.

6) Novra S75 Receiver MAC Address (Found on the sticker on the bottom of the S75.)
example 12 - 34 - 56 - 78 - 90 - 12

7) The IP Address to be assigned to your Novra S75 Receiver
example 123 . 456 . 789 . 123

This information will need to be entered into the S75 after the software has been installed on your computer.

Please Proceed to **Software Installation on Windows NT4.0 or 2000.**

4.0 SOFTWARE INSTALLATION ON WINDOWS

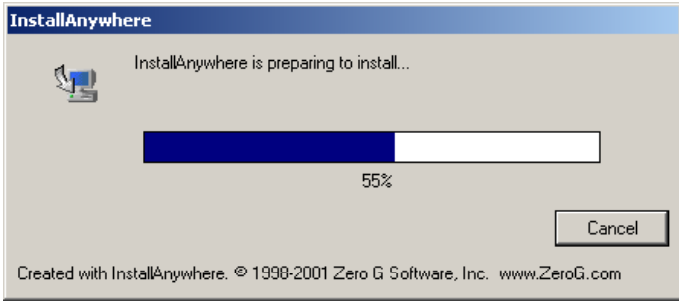
NT4.0 OR 2000

.

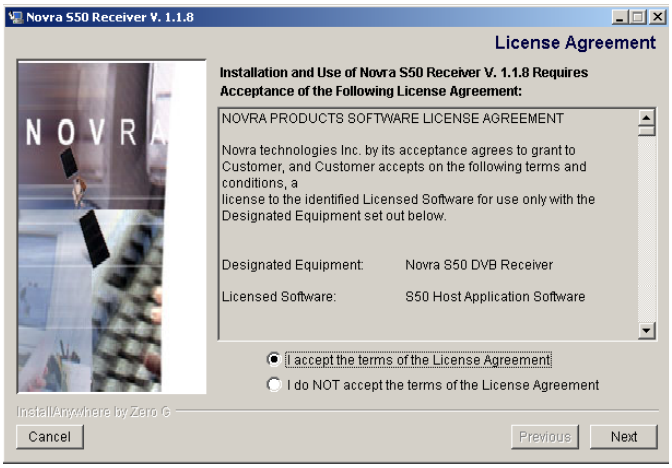
NOTE: - You MUST be logged onto the system as Administrator.
NOTE: - Your screen resolution MUST be at least 800 x 600 and at least "16 bit color" to function properly.

1) Place the installation CD that came with the S75 into the CD drive of your PC.
   If the installation does not automatically commence after about a minute, initiate the process by opening the ***S75 Management Console.exe***.

The process begins with -



You will asked to accept the license agreement. Do so, then click ***Next***.



The process will now step through several windows. Click ***Next*** as required.

Congratulations, Novra S75 Software has been successfully installed.

Please Proceed to Basic Configuration or Advanced Configuration

5.0 BASIC CONFIGURATION

1) Open the S75 Management Console by selecting it from your desktop.

S50 Management Console

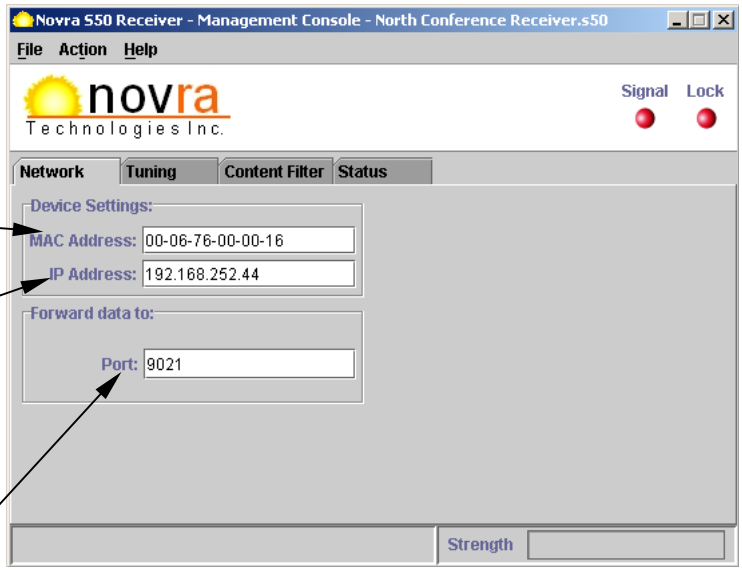
2) The Status Window will open up.

First select the Network tab.

3) Enter your MAC Address here.
(From sticker on bottom of S75 Receiver)

4) Enter your IP Address here.
(If you don't have a preference or suggested value from your network administrator, try 10.11.12.14)

5) The S75 will send outgoing data to port 9021 of the PC. This is the default value. However, a different port value can be entered here.

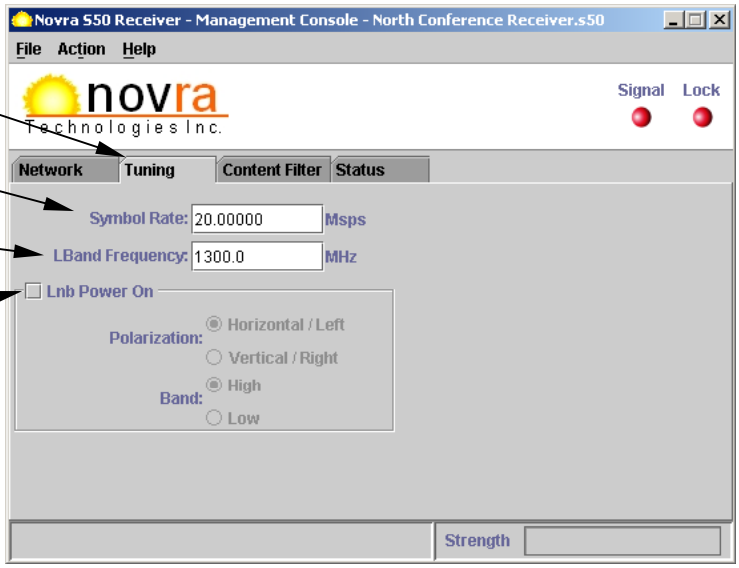


6) Next, select the Tuning tab.

7) Enter the Symbol Rate here.

8) Enter the L-Band Frequency here.

Notice that the **LNB Power On** button is **not** selected in this configuration. And, as a result the **Polarization** and **Band** fields are grayed out.



9) Next select the Content Filter tab.

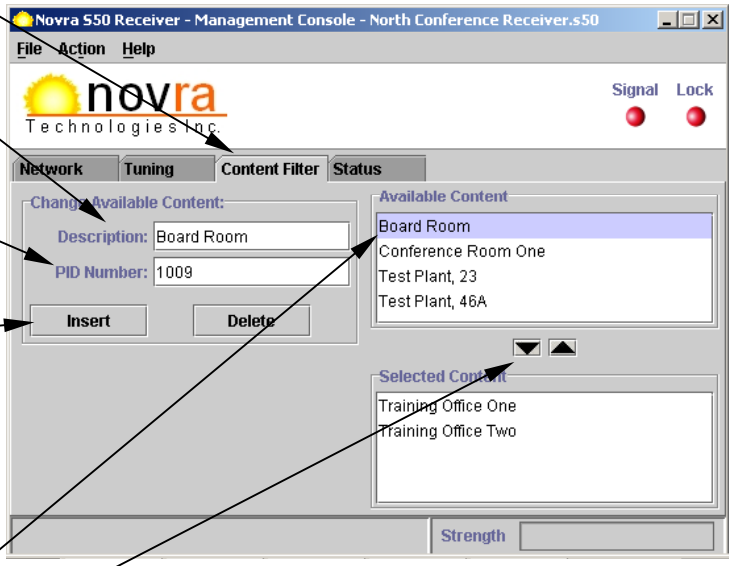
11) Enter a title for the PID, some examples are shown in the Available Content list.

12) Enter your PID number here.

13) Use "Insert" to move this PID and title into the Available Content list. (The PID will not be shown but is associated with the title.) Repeat the last three steps if there are more PIDs to enter.

14) Next, select from the Available Content List.

15) Move the Title (And associated PID) into the Selected Content list with these buttons.



16) Set all of these inputs into the S75 Receiver by selecting "Action" then "Apply" from the drop down menu. **If** any values have been left out or entered incorrectly, the S75 will provide an error message and automatically move to the location of the problem.

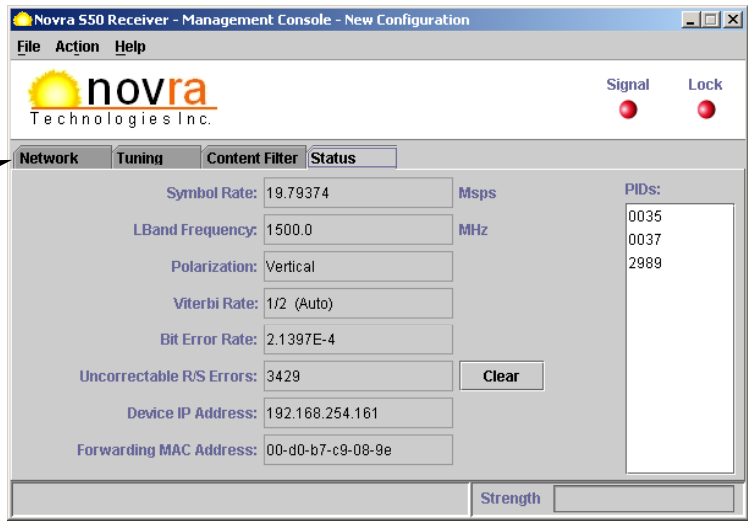
Congratulations You have successfully completed the Basic Configuration.

6.0 ADVANCED CONFIGURATION

1) Open the S75 Management Console by selecting it from your desktop.

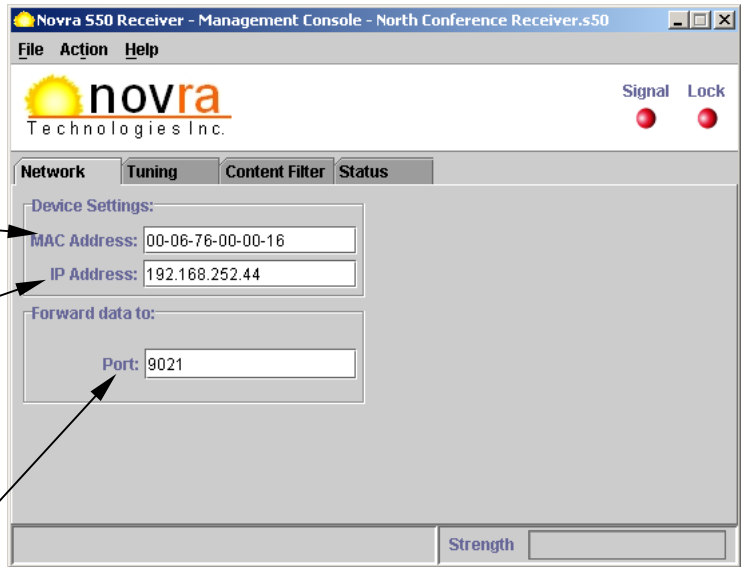
S50 Management Console

2) The Status Window will open up.
First select the Network tab.

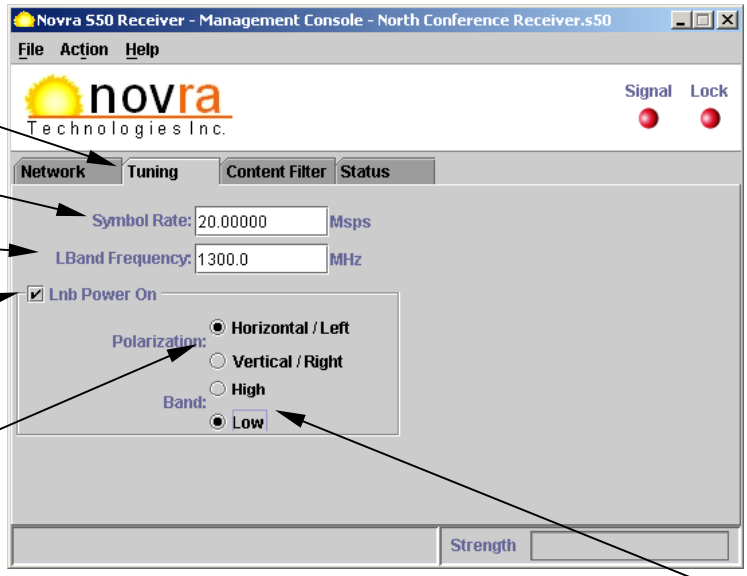


3) Enter your MAC Address here.
(From sticker on bottom of S75 Receiver)

4) Enter your IP Address here.
(If you don't have a preference or suggested value from your network administrator, try 10.11.12.14)



5) The S75 will send outgoing data to port 9021 of the PC. This is the default value. However, a different port value can be entered here.



6) Next, select the Tuning tab.

7) Enter the Symbol Rate here.

8) Enter the L-Band Frequency here.

9) Select the **LNB Power On** button.
Notice that the **Polarization** and **Band** fields are no longer grayed out.

10) Select the Polarization type.
If the LNB does not have the ability to switch Polarization, select based on the LNB's required power supply voltage. Horizontal will provide a nominal +18 Volts on the coax while Vertical will supply a nominal +13 Volts. (+18 is most common.)

11) If a Universal / Dual LNB is to be used, the Band (Local Oscillator) can be selected here. But in most cases, a Single Band LNB is used and Low would be the appropriate setting.

12) Next select the Content Filter tab.

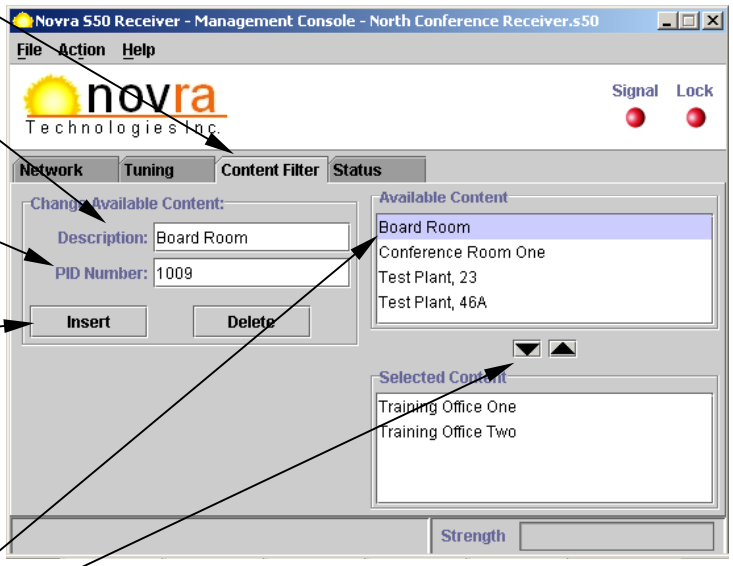
13) Enter a title for the PID, some examples are shown in the Available Content list.

14) Enter your PID number here.

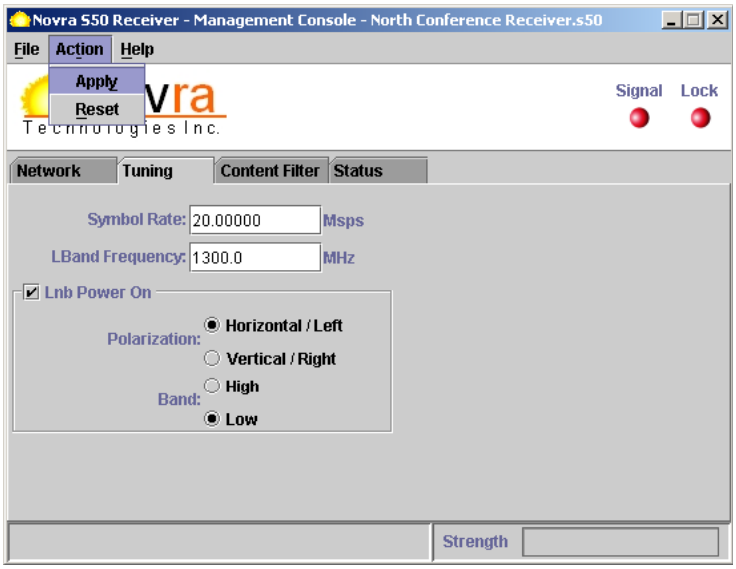
15) Use "Insert" to move this PID and title into the Available Content list.
(The PID will not be shown but is associated with the title.)
Repeat the last three steps if there are more PIDs to enter.

16) Next, select from the Available Content List.

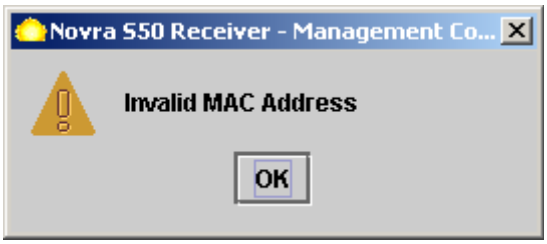
17) Move the Title (And associated PID) into the Selected Content list with these buttons.



18) Set all of these inputs into the S75 Receiver by selecting "Action" then "Apply" from the drop down menu.



If any values have been left out or entered incorrectly, the S75 will provide an error message like this



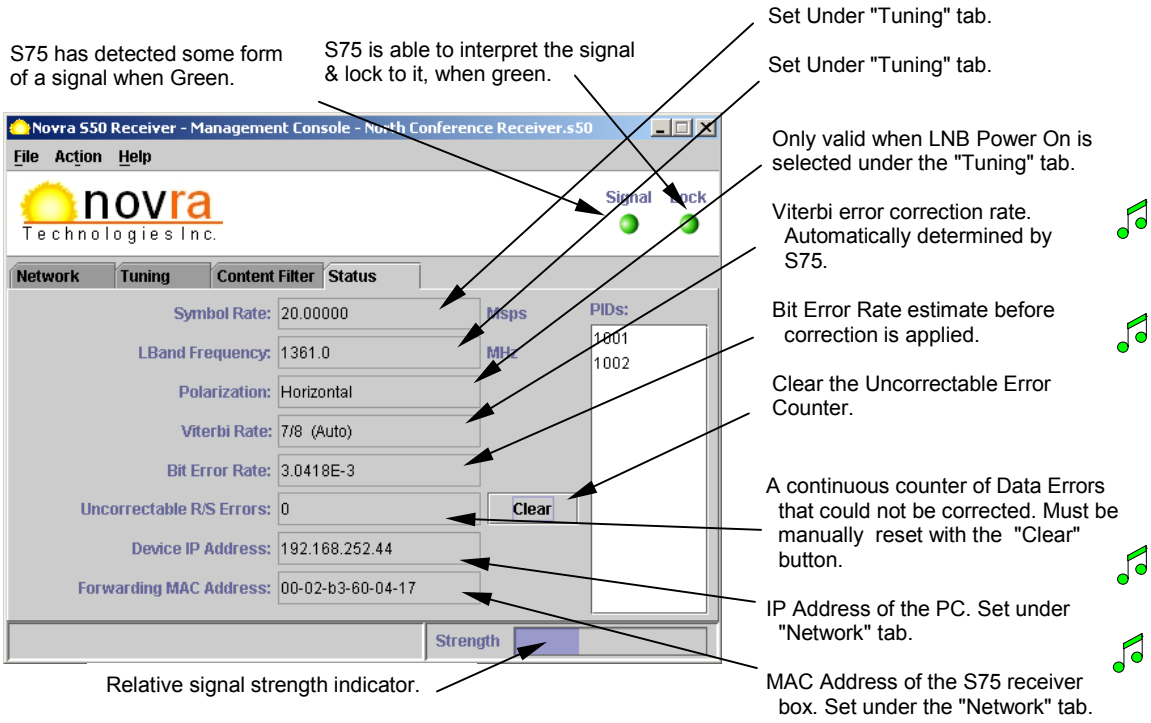
and automatically move to the location of the problem after the user acknowledges the message.

Congratulations You have successfully completed the Advanced Configuration.

7.0 MANAGEMENT CONSOLE DETAILED DESCRIPTION

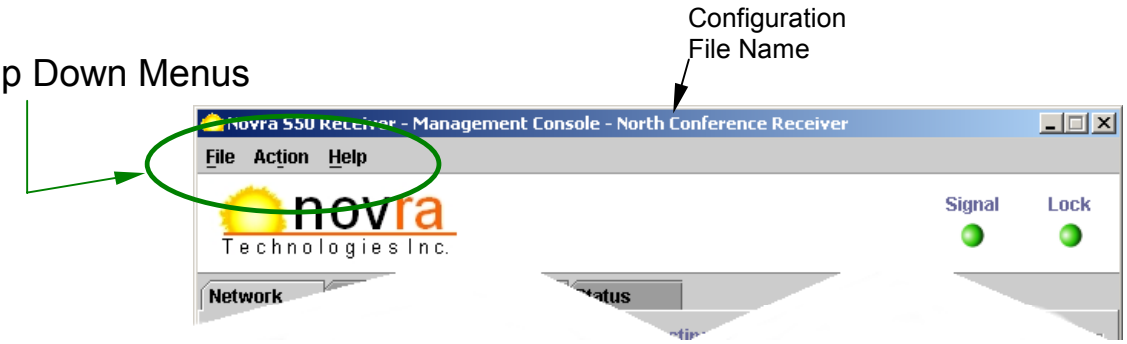
7.1 Status Tab

This is the window that will be first displayed when the Management Console is opened. The values that were last Applied to the S75 will be displayed in this window. The Network, Tuning and Content Filter tab entries will not be populated until a specific file is opened.

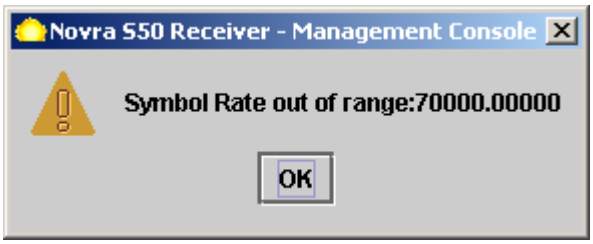


Network, Tuning and Content Filter tabs are described under the Basic and Advanced Configuration sections.

7.2 Drop Down Menus



Action > Apply This is the most important command in the drop down menus. Any changes that are made to the management console will not take affect until this command is executed. This command causes the S75 to assert the settings that have been provided. All the settings, under every tab, are checked for validity when this command is asserted. A message window will notify the user if any of the configuration settings are not correctly entered.



When all entries are valid and the settings are accepted by the S75, a reply will be sent back to the Management Console.

Action > Reset This command sends a reset command to the receiver hardware causing it to go through its complete initialization routine. This will interrupt data reception for up to 30 seconds.

File > New This command clears all parameter entries in preparation for new values. Using this command causes the S75 to expect a new File Name to be entered under the File > Save As menu, but it will not accept the file until all the new parameters, for every tab, have first been entered. After all the parameters have been entered and a file name assigned under File > Save As, the new settings can be asserted using the Action > Apply command.

File > Open	This command prompts the user to select a configuration from a drop down menu. Initially, only the system default **settings.S75** will be available until the user has had the opportunity to create other configurations. Opening a configuration does not cause its settings to be applied. If the user wants these settings to be active, they must next use the Action > Apply command. In this way the user can examine file settings without disrupting signal flow.
File > Save	This command saves any changes that have been made to the current configuration but does NOT apply the new settings to the S75 receiver. (The command Action > Apply is required to assert the settings.)
File > Save As	This command prompts the user to provide a new name for the file that is currently displayed. The current settings are then saved under the new file name. It does not change any of the settings. Deleting Files A specific command for this function is not provided. The user can remove unwanted files by sending them to the recycle bin.
Help > Help	This command opens the specific help file for the Tab that is currently open. Additional information and discussions can be found in the User's Manual.
Help > About	This command lists the versions of the S75 Software and Hardware.

8.0 SPECIFICATIONS

8.1 Receiver Characteristics

Symbol rate:	1-45 Msps
Data rate:	Up to 50 Mbps (including ReedSolomon, 46 Mbps ReedSolomon removed)
Viterbi decoding:	Auto detected to values of 1/2, 2/3, 3/4, 5/6 and 7/8
Receiving frequency: (L Band)	950-2150 MHz
Tuning search range:	+/- ½ the programmed symbol rate, to a maximum of +/- 10.0 MHz
Input terminal:	F-type 75 Ohm
Input level: (LBand Frequencies)	950 – 1750 Mhz: -65 to –25 dBm 1750 - 1850 Mhz: -60 to –25 dBm 1850 – 2150 Mhz: -50 to –25 dBm
LNB supply voltage:	None (Disabled) or 13 Vdc / 18 Vdc
LNB control:	22 kHz tone (DiSEqC 1.0)
LNB supply current:	250 mA (Max)

CAUTION: Nothing should be inserted between the S75 and the satellite dish except for a surge suppressor. Cable TV Splitters, TVs, VCRs, and FM receivers are not designed for connection to this portion of the network. They will not work and if they are connected, even for a brief moment, they will probably never work again because the power on the coax will destroy the input of the misplaced unit.

8.2 Minimum System Requirements

Your computer must operate with any one of the following operating systems to successfully use the Novra S75 Receiver:

- Windows 2000, with Service Pack 2
- Windows NT4.0, with Service Pack 6a

Your computer must have **at least** the following:

- Processor: Pentium 566 MHz
- RAM: 32 MB
- Free disk space: 40 MB
- Video: card and driver that support 256 or more colours
- CD drive (required for software installation only)

- Ethernet network interface card (NIC): 100 Mbps (100 BaseT)

NOTE: - The receiver **may** work with system parameters below those specified but performance will be lacking.

NOTE: - Your maximum data throughput will be limited by a low speed Ethernet card. i.e. Don't expect 20 Mbps through a 10 Base T Network Interface Card.

NOTE: - Performance will be highly dependant on other applications that your PC is running.

8.3 Supplied Equipment

Please confirm you have received all the equipment listed below.

- Novra S75 Receiver
- Cross-over cable
- Power supply (120 Vac to 24 Vdc North America; **OR** 220 Vac to 24 Vdc European)
- S75 Receiver Software CD
- Novra S75 Receiver User Manual (Hard copy or Soft Copy on CD)

APPENDIX

Terms, Definitions, and Tidbits of Information

Crossover Cable A crossover cable is a cable that is used to connect two computers by reversing, or crossing over, the cable pin contacts. This eliminates the need to use a hub when connecting two PCs. It is also referred to as a "Null Modem" cable.

Coax Cable Looks like this -

And is most commonly used for Cable TV feeds inside a house or apartment. This form of cable allows the high frequencies of TV, and Satellite type signals to move from one place to another with a minimal amount signal loss.

DVB Digital Video Broadcasting (DVB) is a set of standards that define digital broadcasting using satellite, cable, and terrestrial infrastructures.

FEC Forward Error Correction. A system of error control for data transmission where the receiving device can detect and correct certain errors.

Feed Horn This is the device that receives the focuses signals from a satellite dish. It collects these signals and submits them to the next piece of equipment in the network, usually a Low Noise Block converter which then changes the signals into a better format for transpiration to the receiver.

Geostationary Orbit The position where a satellite is 35,786 kilometers (22,241 miles) above the equator. At this distance, the satellite Orbits the earth at the same rate as the earth is turning. This causes the satellite to appear stationary in relation to an observer on the ground.

IP Internet Protocol. The network communication protocol used on Ethernet networks and the Internet.

IP Address The 32-bit computer address defined by the Internet Protocol. It is usually represented in dotted decimal notation. Example: 192.168.111.112

L-Band This range of frequencies is from 950 MHz to 2,150 MHz. It is much lower than those used by satellites (About 1/10 to 1/6). Satellite frequencies travel well through space and our atmosphere but do not do well through the cable that comes from the dish on the roof to the receiver. So. LNBs convert satellite frequencies to the lower, easier to transport, band of frequencies referred to as the L-Band. It is L-Band frequencies that the S75 receiver tunes to.

LNA Older systems used a unit called an LNA **L**ow **N**oise **A**mplifier. This unit amplifies the RF frequency and then transmits the signals down a special (Expensive) cable to the reciever. Note that received signals are not converted to lower frequencies by this unit.

LNBs LNB stands for a **L**ow **N**oise **B**lock-converter. This unit receives the signals collected from a satellite and converts their very high frequencies (12 Giga Hertz, written 12 GHz, which is actually 12,000,000,000 cycles per second) to a lower and somewhat more usable range. All LNBs have a Local Oscillator (LO). This number is usually stamped on the LNB but not always. It may be necessary to check the original specifications that came with the LNB or use the model number and brand name to search the Internet.

LNBF LNBF stands for a **L**ow **N**oise **B**lock-converter and **F**eed horn. This is quite a common arrangement where the Feed Horn focal point that collects reflected signals from the satellite dish is combined with the low noise block-converter into one package.

LO Local Oscillator. This is a circuit that creates a tone of a very specific frequency. These units have many applications in electronics. This important thing to remember is that there is an LO in the LNB (Low Noise Block-converter) and it is part of the circuit that converts the received satellite RF Frequencies to the more user friendly L-Band Frequencies. Typical values include 9.75, 10.60, 10.75, 11.00 and 11.25 GHz for the Ku band and 5.15 GHz for the C Band of satellite frequencies.

MAC Address The Media Access Control (MAC) address is the unique hardware address for any piece of electronic equipment attached to a network. The MAC Address for your Novra S75 Receiver is displayed on a sticker on the bottom of the receiver.

Mbps Mega bits per second. (Million bits per second)

MBps Mega Bytes per second. One "Byte" in computer terms is the same as 8 bits. It is often referred to as a word.
1 MBps = 8 Mbps = 1 million Bytes (Words) per second = 8 million bits per second.

Msps Mega symbols per second. Suppose you have four symbols, call them A, B, C & D. Let the Symbol A represent two bits of data with the value 00.
Let B represent two bits of data with the value 01
Let C represent two bits of data with the value 10
Let D represent two bits of data with the value 11 (Or some other data scheme.)
This means that if the signals we are interested in consist of 1.0 Msps (That's 1 Million symbols per second), and each symbols represents two bits of data, then our signal has a data rate of 2.0 million bits per second (2.0 Mbps).
The important point to remember is that satellite systems send and receive symbols which are then converted into data. The S75 takes the resulting data and forwards it to your computer in bursts called "packets."

Packet A packet is the unit of data that is routed between an origin and a destination. When any file is sent from one place to another (the Internet as an example) it is divided into "chunks" of an efficient size for routing. Each of these packets is separately numbered and includes the Internet address of the destination.

PID Packet Identification Code. This code is used by the receiver to sift through the different packets of the transport stream. The transport stream contains data representing many different signals. The S75 software running on your PC, uses the PID number to find only those packets of data that contain the information you have requested. (See RF Frequency.)

Polarization, Circular (Right / Left) In layman's terms, a circularly polarized signal corkscrews towards the earth. Unlike linear polarization (described below), where the signal is fixed in an up and down fashion or a side to side fashion, Circular Polarization causes the signal to rotate. If it were possible to actually see the incoming signal, it would rotate like the hands on a clock. As with Linear Polarization, this has two modes of operation. It can either rotate in a clock wise fashion or counter clockwise. Polarization is very useful because it allows the frequency of a Right polarized signal to overlap with the same frequencies of a Left polarized signal.

Polarization, Linear (Horizontal / Vertical) In layman's terms, a linearly polarized signal from a satellite approaches the earth as a wave that goes up and down like the waves on the ocean, or from side to side like an intoxicated driver on the highway. These two types of waves are classified as being Vertically or Horizontally polarized. Polarization is very useful because it allows the frequency

of a Vertically polarized signal to overlap with the same frequencies of a Horizontally polarized signal.

RAM Random access memory. Used for short term storage of information requiring quick access on a computer. Information stored in RAM can be accessed by the computer much faster than information on the Hard Drive can be accessed.

RF Frequency Each satellite in orbit has several channels that it can use, each with its own RF Frequency. (Each channel is often referred to as a transponder.) The easiest way to understand them is to think of your FM radio. There are many channels on the FM dial that one can choose from. ("*99.9 FM, All Rock, All the Time*") When you input the station number to your FM receiver you are actually telling it what RF Frequency it should look at. (99.9 FM means that 99.9 Mega Hz is the desired frequency.) But unlike the FM radio where the channel you tune to only contains one stream of music, a satellite channel contains many individual signals. One channel can contain Internet data **and** video **and** audio **and** specialized data in any number of permutations and combinations. The S75 uses the PID numbers that come with each Internet data, video, audio and specialized data signal to separate them all. (See PID.)

Satellite Signal Hierarchy

1 Satellite has -
|
10 - 24 Transponders (Channels) each with
|
dozens of distinct Rf Frequencies each containing
|
up to a theoretical maximum of 8190 packet streams identified by their individual PIDs.

Subnet A portion of a network, which may be a physically independent network segment, and which shares a network address with other portions of the network.

Symbol Rate See Msps

Transponder This is the unit on the satellite that receives a signal transmitted from the earth station, amplifies it, changes its frequency and retransmits it back down to earth. Each radio channel has its own transponder and a number of transponders on the satellite are used to cover the allocated frequency band. A typical satellite will have 24 transponders.

Viterbi "Convolutional encoding with Viterbi decoding is a Forward Error Correction technique that is particularly suited to a channel in which the transmitted signal is corrupted mainly by additive white gaussian noise." Further information can be found by searching the Internet or looking at any of these sites.
http://pw1.netcom.com/~chip.f/Viterbi.html
http://hissa.nist.gov/dads/HTML/viterbiAlgorithm.html
http://www.mathworks.com/access/helpdesk/help/toolbox/commblks/ref/viterbidecoder.shtml

end.