

PCI MAX 2007+ (v 12/2006) PC based FM stereo transmitter card

PCI MAX 2007+ is a high performance PLL controlled FM transmitter for your everyday PC compatible computer. It is all-in-one solution, perfect for transmitting your music throughout your house, your yard and further, if you couple it with our new 15W booster+. It can even serve as a local, college or a community radio station, with the features and quality you expect from the professional setup, with amazing audio quality and stereo separation. It is perfectly suited for homebrew DJ's. It is easily tunable anywhere on the dial with a simple click of the mouse.



PCI MAX 2007+ comes with a handy new antenna and a lot more power...

Technical specifications:

- RF Output Power: 0 to >2000mW max (depending on model)
- RF power adjustment: In Windows; Slider, in standalone mode; LCD digital control
- Output connector: F
- Output Impedance: 50 Ohms
- Frequency Range: 87.5-108MHz (can be extended for special request)
- PLL Steps: 50KHz
- Frequency stability: +/- 100Hz
- Spurious rejection: -70dB
- Harmonic rejection: -50dB
- Power Supply: Internal from PC or external 12-15V/1A
- Quartz Locked PLL Frequency Control
- Ultra Stable Output
- Audio performance: Less than 0.01% distortion, 30Hz-15KHz
- Stereo channel separation: >45dB
- Audio processing: Limiter, pre-emphasis, low pass filter
- Pre-emphasis adjustable to 50uS or 75uS
- Built-in balanced audio inputs and MPX filter

NOTE: You need external 12-15V stabilized power supply to obtain full output power. All versions starting with 1000mW and up require a good antenna in order to prevent damage to the output stage. Consider one of the better antennas from our website or any of the ones listed under accessories (do check those out).

PCI MAX 2007+ accessories, available from the manufacturer's or distributor's website:

- External power supply (enables more output power), 15V/1A
- RDS board (plugs into PCI MAX 2007+ board)
- Audio Y splitter
- 15W power booster, 150W and 300W power boosters
- A wide selection of external antenna options
- A wide selection of connectors and adaptors and various coaxial cable types for antenna installations
- LCD control unit for stand-alone use without the PC
- Stand-alone 19-inch rack enclosure (requires above LCD unit) for stand-alone use
- Miniature LCD control unit with LED VU meter for stand-alone use without the PC
- Miniature stand-alone enclosure (requires above miniature LCD unit) for stand-alone use

What is new since PCI MAX 2006?

PCI MAX 2007+ may seem as a minor design upgrade from the PCI MAX 2006+ at first, however some of the improvements are pretty big, though not obvious at the first glance. We listed some of the important and other smaller improvements below:

- Pre-emphasis is now selectable (it used to be fixed to 50uS)
- RDS edge connector for easier connectivity (RDS requires RDS daughter board, which is simply plugged in. Old RDS daughter board from model 2006+ is compatible and can be used.
- Much stronger RF output stage for more RF power (more than 2000mW possible) and better immunity to high SWR.
- For example, 1000mW version now typically produces a bit more than 1W (less with bad airflow as temperature protection reduces power a bit)
- Much better output LPF filter (7-element elliptical, same as Max pro 3+).
- All accessories from model 2006+ still compatible.
- Number of small improvements for better sound, stereo separation and increased reliability.
- Improved PCB layout for slightly improved audio quality (less noise from PC).
- Special graphite conductive layer on PCI edge connector greatly improves reliability
- PCI edge connector is now rounded and easily fits into PCI slot
- A much better antenna is now included with the card along with about 2m of coaxial cable and a handy stand
- A better audio jumper cable is now included
- And yes, we have a new driver on a new CD media

PCI MAX 2007+ still has the built-in balanced audio inputs, limiters, precise pre-emphasis and MPX filter. It can be switched to MONO or STEREO by a simple click of a mouse button. There is a phono audio input at the back of the card, which connects to the sound card via provided jumper cable. If you need to keep the particular output for your speakers, simply use Y splitter (available from radio shack or our website). Audio can also be fed to the card from other audio sources (cd players, mixers etc).

Q&A section

Q: How does the sound get from the sound card to the PCI MAX 2007+?

A: Well, audio jumper cable is included; it connects between your sound card's output and the PCI MAX 2007+. This cable passes the audio to the transmitter and you hear the music on your radio.

Q: So I can also plug some other audio to this audio input, such as CD player or portable MP3 player?

A: Sure, you can use any audio source.

Q: Can the frequency band be extended to cover Japanese or other FM band?

A: Sure, 60-150MHz can be covered by small modifications to the board, if there's enough interest out there.

Q: I just want to cover my apartment and my yard. What do I need?

A: No need to go crazy with power in that case, we recommend just the PCI MAX 2007+ 500mW in this case, the included antenna will probably be more than enough. There's absolutely no need to go overboard and spend for 1W version, special antenna, external power supply, and coaxial cable in all such cases.

BEFORE YOU START...

CAUTION: Our PCI MAX card is legal to use in many countries, but may not be legal in yours. Please consult local authorities before you start using this product.

SETTING UP THE PCI MAX CARD

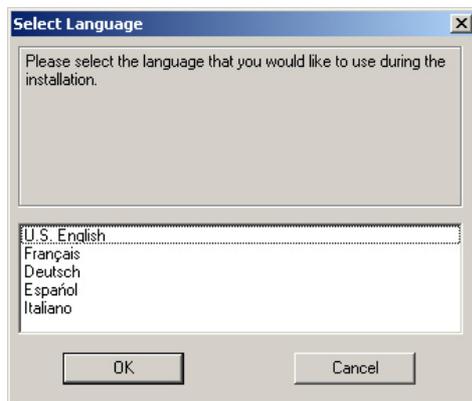
Setup basically consists of two major steps:

STEP 1 – SOFTWARE INSTALLATION

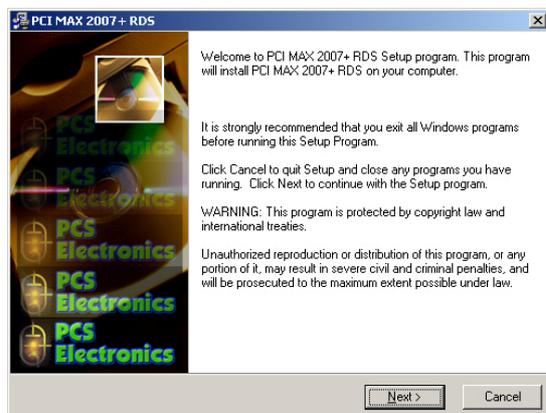
Insert the PCI MAX installation CD in the computer's CD-ROM drive. NOTE: Some computers will start the CD automatically and others will not. If the CD does not start the installation program in a couple of seconds, you need to manually run the setup file, usually found in the appropriate directory on the supplied CD. If you lost the CD, download the driver from our website. It can be found in the support section of the website. The setup program will make a backup of every file installed so that you can simply uninstall the program later, if you experience any problem with your computer.



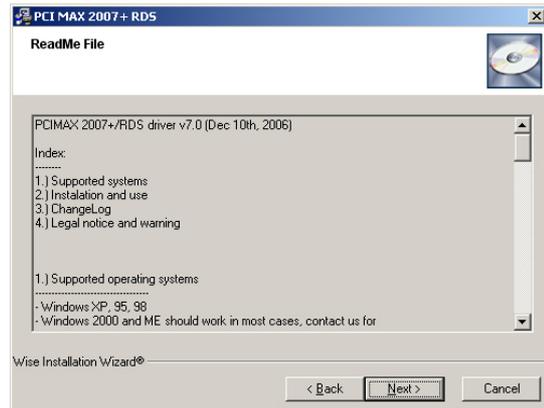
You've just started the Setup program...



Now select language for the installation, click OK and wait for the program to search old versions



Welcome screen appears shortly...



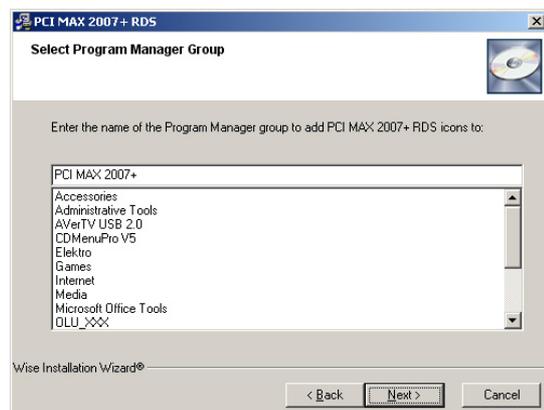
Check out the readme, it may contain useful info...



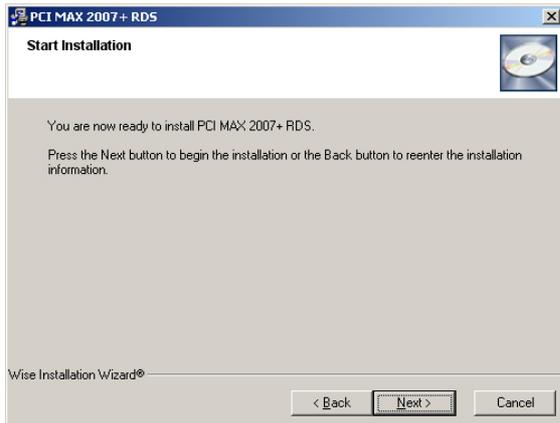
Select installation directory...



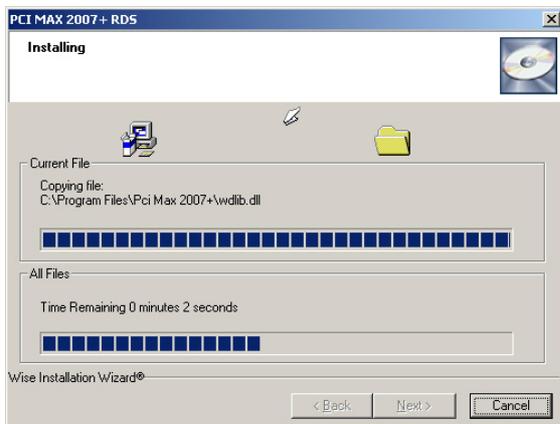
Select Yes here, could come handy later



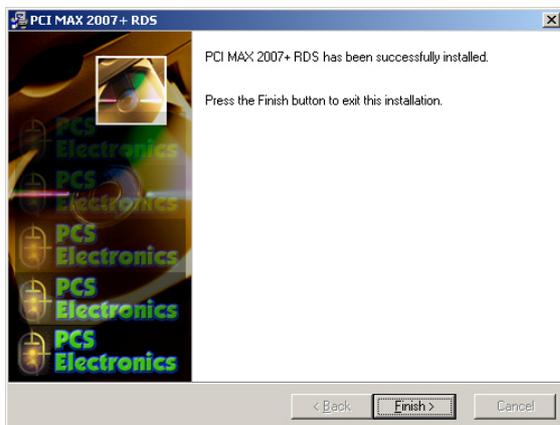
Select program group here



Click Next to start copying files...



Wait for the process to finish...



You're done, click Finish!

Shut down the PC after you've successfully installed the Setup program.

STEP 2 – PCI CARD INSTALLATION

You will need one free PCI slot to install your PCI MAX. Remember to turn off your computer and remove the power cable from the wall or power strip. Open your PC, find an empty PCI slot and insert your PCI MAX card into that slot as you would any other PCI card. You may need to move your card to another slot, if Windows doesn't find it as you boot up. This often happens with other cards

as well (network cards, sound cards) so don't be alarmed. If you can, place your card as far away from other cards as possible. Also, move any cables as far as possible away from the PCI MAX. Finally secure your PCI MAX card with a screw. Make sure that none of the cards are in contact with each other. It is now time to install the included antenna (or another better antenna, if you're using a high-powered card); plug it into the F-connector (denoted with A on the picture below).



A; antenna connection, B; power indicator LED, C; external power supply, D; audio input, E; RDS RS232 cable (optional for stand-alone use)

Use the provided jumper audio cable to connect the audio input (D) to the sound card. If you wish to keep your sound card's audio output, use Y splitter/adaptor and wire one of the outputs to your speakers, for example. Now that you've installed your card Windows should report finding new hardware after loading. When it does, point the location of the driver to the CD-ROM (make sure you inserted installation CD first) or to the directory where you installed the program. Example below is for Windows XP. Other operating systems will display similarly looking panels. Complete the installation as the operating system instructs you. You may need to reboot your PC again, depending on the operating system that you're using.



This is an example for Windows XP.

There will be a new icon on your desktop, you can go ahead and click it now!

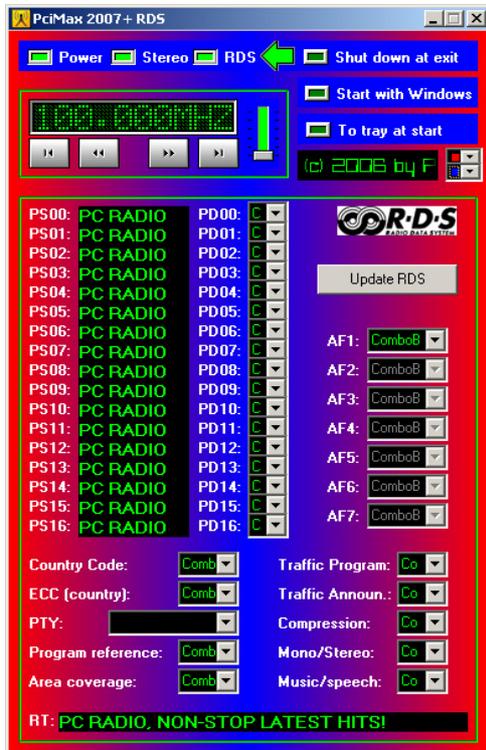


PCI MAX icon, click it to bring up the control program for the PCI MAX card.

A program will open, enabling you to change frequency, mode of operation (stereo or mono) and turn the transmitter on or off. You will also be able to change RDS parameters, if your card supports RDS.

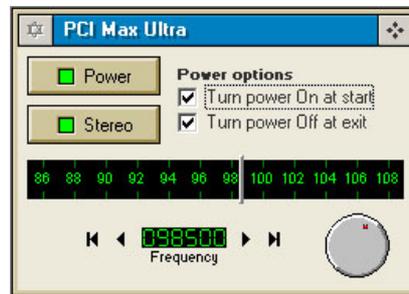


PciMax control program in compact mode



PciMax control program in full mode with all RDS parameters displayed

SAM family of radio scheduling programs used to support old versions of PCI MAX. We are currently working with them to ensure support of PCI MAX 2007+. SAM3 is a all-in-one broadcasting program for PC, supporting DSP plug-ins, scheduling, it publishes your play lists on the internet automatically and does a lot more. We recommend this program to everyone! Check our software section!



The PCI MAX control program in SAM2.

STEP 3 – TROUBLESHOOTING

If you get any of the two error messages displayed below, first try the proposed fix. Look for the installation directory (by default this would be c:/Program files/PCI MAX 2007+ and look for a file named install.bat. Click this file and let it manually register the drivers. This fixes the problem for most users. If you continue to have problems, consider moving the card into another PCI slot or, if still not successful, contact PCS tech support from the website.



“Unable to open PCI MAX” error message



“Access violation” error message

USER INTERFACE – FM BASIC

Controls in the basic mode are pretty straight forward. Stereo controls the stereo/mono selection, the slider sets the output power (highest when this is in the top position), the buttons under the frequency display are used to set the frequency in big or small 50KHz steps. The green arrow can be used to display advanced settings. If you enable RDS button, the green arrow also gives access to RDS parameters

USER INTERFACE – RDS parameters

PS and PD

RDS receivers can display PS data in chunks of 8 characters. PCI MAX 2007+ card makes it possible to define up to 17 such 8-character blocks and loop them in a continuous loop. The time each of the blocks will be displayed is defined with PD00 to PD16. A setting of 0 disables the PS for this block meaning it will be skipped and next PS block will be displayed. You can for instance set PD01 to PD16 to zero, meaning only first PS block will be displayed, which is what most stations do nowadays.

RT

RT enables up to 64 characters to be displayed on your receiver. This is done by scrolling. The speed of scrolling is defined by the receiver and cannot be influenced by the transmitter.

Other parameters

Other RDS parameters are covered in great details here: http://en.wikipedia.org/wiki/Radio_Data_System

UPDATE

Once you've set the RDS parameters, click the UPDATE button to send them to the encoder.

AVAILABLE PCI MAX MODELS

There are five models available at the moment. Look at the table below to see how they compare.

MODEL	STEREO	HEATSINK	RF power
PCI MAX 2007+ LPFM	YES	Not needed	Part 15 compliant (~5mW)
PCI MAX 2007+ 500mW	YES	YES	500mW (*)
PCI MAX 2007+ 1000mW	YES	YES	1000mW (*)
PCI MAX 2007+ 2000mW	YES	EXTRA BIG	2000mW (*)
PCI MAX 2007+ PLATINUM	YES	EXTRA BIG	2300-3000mW (**)

All cards except LPFM require external power supply to reach their full output power. A maximum of about 200mW is available without external power supply.

Included antenna can be used at power levels at or below 500mW. 1000mW or more requires a dedicated, external tuned (with SWR meter) FM band transmitting antenna.

(*) Output power guaranteed or exceeded in at least one part of the entire FM band (with sufficient cooling air flow)

(**) Actual power depends on cooling efficiency and particular card, 2500mW is typically obtainable with side-mounted fan.

SPECIAL NOTES FOR ADVANCED USERS

Here are some special notes for those who want to make the most from this card. We will cover changing pre-emphasis, using balanced inputs in stand-alone mode, coaxial cable, antenna, power supply and other issues.

-Antenna Antenna is a crucial part of any radio communication system, especially if you need good range. A good antenna placed as high as possible can massively increase your range. We recommend that you look at many of the designs for homebrew antenna projects at our website (guides section) or any of the factory produced models. It is usually a good idea to place your antenna away from your transmitter and audio system and connect it via coaxial cable! If you intend to use the high power version of PCI MAX 2007+, purchase a suitable tuned antenna from our website. Using any non-matched antenna (a piece of wire also qualifies as unmatched here) with the high power version of PCI MAX card can result in significant amount of power being reflected back to the output stage and subsequently damaging the output transistor, which is not covered by warranty (since it is usually user error).

A PROVIDED ANTENNA WILL WORK, BUT YOUR RANGE WILL BE LIMITED! INVEST IN A BETTER ANTENNA FOR A BETTER RANGE!

-Coaxial cable Common RG-58 from Radio Shack is not the best you can do. Use it only for short runs – up to about 10m. BELDEN makes terrific coax in various qualities and with very low loss (measured in dB's...decibels). Don't buy more than you need to make the long run to your antenna and do not make too many "jumpers" between PCI MAX and your antenna as all you'll do is create a higher VSWR and more line losses. Avoid cheap TV coaxial cable.

-Audio equipment. This is obviously going to be your PC, but you can easily power PCI MAX from any other audio source, such as CD player, walkman or MP3 player. Remember, PCI MAX cards can also be used without the PC in standalone mode with add-on LCD display unit.

When used in a PC, use WinAmp or any other MP3 player. Plug-ins are available and take care of limiting-compression. You are advised to pull down the equalizers above about 15 KHz as the broadcast standard requires them to be attenuated. They can produce hiss as they can interfere with the pilot carrier signal at 19 KHz. Think about specialized scheduling software, such as SAM3 or Jazler, also used by real radio stations. Get a good sound board! Integrated sound boards are often noisy. Check the forum at our website for tips:

<http://www.pcs-electronics.com>

-External power supply. A 12-15V /1A DC stabilized type is required. The plug needs to be positive in the middle. Please make sure that your power supply is truly stabilized and does not provide excessive voltage under no load conditions!! You only need external power supply in case of the following:

1. Your PC is too noisy and you want to eliminate the PC-borne noise.
2. You want to increase output power. PCI MAX throttles down a bit when used without external power supply. This helps reduce noise and prevents any damage to the computer or the output stage. When increasing output power this way also consider using a proper antenna, such as Comet or the affordable and well performing GP antennas. Please check our website for suitable types.

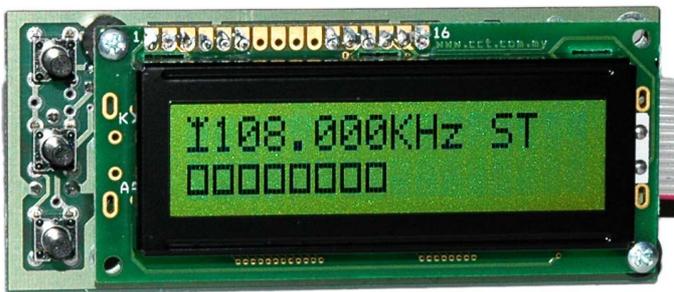
USE AND FINAL NOTES

Select the desired working frequency with the mouse. That slider next to the frequency display is the output power adjustment trimmer. Set it to minimal sufficient value in order to avoid interference to other users or neighbors. Open your MP3 player or other audio player. Turn on any fm radio and set the receiver to the transmitter's frequency until you can hear the computer's audio through the fm radio. You will need to adjust audio level so that the sound on the radio sounds naturally and without distortion. Too much volume may sound good on your radio, but will sound horrible a few hundred meters from the transmitter! You shouldn't sound louder as other FM stations. Now any audio you play through your computer will play through the transmitter to any fm radio tuned to the frequency you have the transmitter set to. You may want to try a few different stations because of better reception in different areas some spots on the dial may work better than others.

WARNING: PLEASE BE SURE THAT YOU ARE TUNING IN TO AN AREA ON YOUR LOCAL FM BAND THAT HAS NO STATION BROADCASTING ON IT, YOU DO NOT WANT TO INTERRUPT ANYONE ELSE'S LISTENING TO LOCAL RADIO STATIONS, IT'S RUDE AND ALSO ILEGAL!

FOR ADVANCED USERS

PCI MAX contains a high quality digital stereo encoder and PLL stabilized FM transmitter. There's a lot more you can do with PCI MAX than meets the eye. For example, you could use it without the PC. Have you noticed the 14-pin connector on the PCI MAX board? This is a control unit that you can attach to it to make it work without the PC:

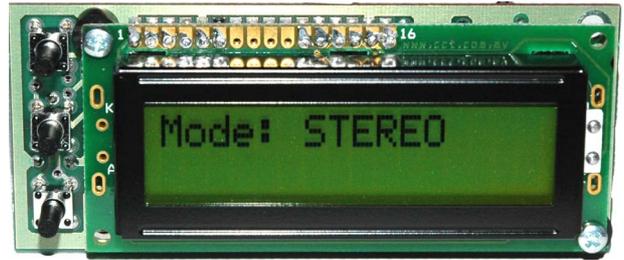


The LCD display unit for the PCI MAX card – standalone mode without the PC.

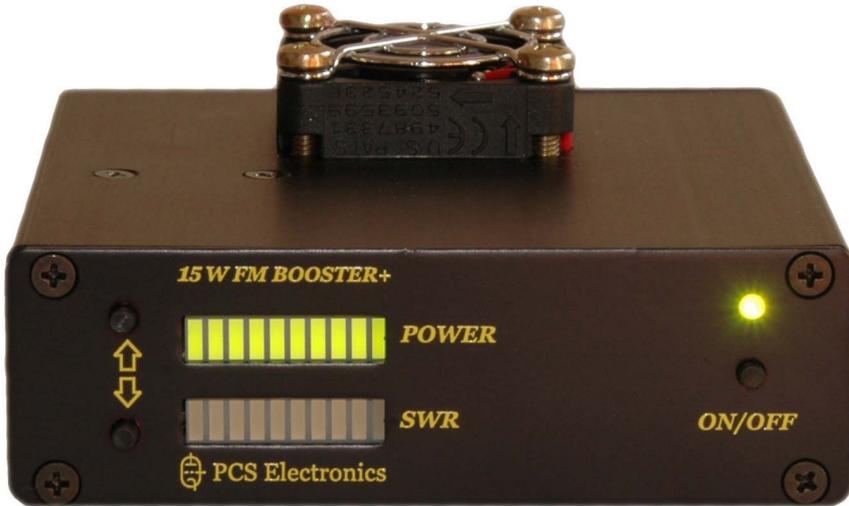
What we see on the display here is frequency, stereo mode and output power. See those squares at the bottom? The more squares, the more power you have at the moment. What next? Well, for example, you could buy a 19" professional rack mount enclosure (check our website) and turn your PCI MAX card into a stand-alone no-tune stereo FM transmitter. If you need more power, why not put our 15W booster into this very same enclosure? LCD control unit with 3 keys and LCD display lets you set the power, frequency and stereo/mono mode.



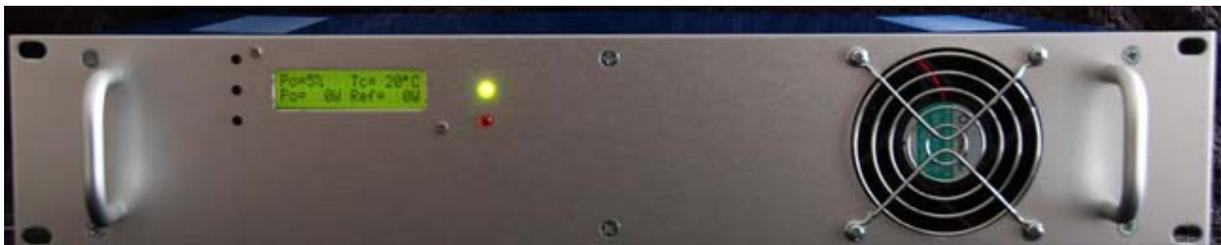
Setting the RF output power with the LCD control unit.



Setting the stereo/mono mode with the LCD control unit.



The new 15W booster with SWR and POWER meter easily covers a few miles



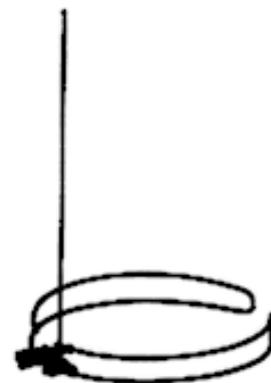
The new 150W and 300W amplifiers with SWR and POWER meter really boost the range



Some of the antennas – GP



Comet antenna



PCS0201 antenna

IMPORTANT NOTICE!

Please remember to turn off the transmitter when not in use! This goes especially for the 15W booster. Make sure you turn it off until you start the program on the desktop and turn it off after you stop using the program! Remember that anything you broadcast through the transmitter can be heard by anyone tuning in to that frequency. Although it is unlikely certain weather conditions may allow the signal to go further than your immediate listening area so please don't broadcast anything you don't mind anyone else hearing.

WARRANTY

Any PCI MAX unit that fails due to defects in workmanship and/or materials will be repaired or replaced, at the discretion of the manufacturer, to the original purchaser who provides dated proof of purchase. Damages caused by abuse, misuse, negligence (i.e. Water damage, improper installation, lightning strike) are considered to be avoidable. Output RF transistor is not covered by warranty. The stronger version of the PCI MAX card requires a properly tuned FM band antenna, using other type or just a piece of wire may damage output RF transistor. Also, your output power is higher when you use external power supply so the same warning concerning antenna applies here as well.

LEGAL INFO

It may be illegal to operate this device in your county. Please consult local authorities before using our products! PCS Elektronik d.o.o. is not responsible for any damage to your PC arising from use of this product and will not be held responsible for any violation of local laws pertaining to the use of this product. It is entirely your responsibility that you make sure you operate in accordance with local laws and/or regulations.

LIMITATION OF LIABILITY

To the maximum extent permitted by applicable law, in no event shall PCS Elektronik d.o.o. or its suppliers be liable for any special, incidental, indirect, or consequential damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or any other pecuniary loss) arising out of the use of or inability to use the PRODUCT, even if PCS Elektronik d.o.o. has been advised of the possibility of such damages. In any case, PCS Elektronik d.o.o.' entire liability under any provision of this agreement shall be limited to the greater of the amount actually paid by you for the PRODUCT or U.S. \$5.00; because some states and jurisdictions do not allow the exclusion or limitation of liability, the above limitation may not apply to you.

Thank you for purchasing the PCI MAX card!

We hope you will enjoy it as much as we do and remember to tell your friends about it. We would also like to invite you to visit our website; it offers an abundance of information related to broadcasting and radio, as well as feedback form, a forum and support section.

From all of us we wish you happy broadcasting!

Your PCS Electronics team
www.pcs-electronics.com

ALSO AVAILABLE FROM PCS ELECTRONICS

We also carry a big range of:

- FM transmitters in assembled and KIT form
- AM transmitters with extremely clear modulation (PWM design)
- Various accessories for professional and hobby FM radio stations
- A large assortment of hard to obtain RF components (RF transistors; MRF, 2SC, coils, silver plated wire, coaxial cable, capacitors, quartz crystals and many others)
- PC based FM transmitters (PCI MAX pc based FM transmitter turns your PC into a radio station)
- A large number of beginners guides to get you started
- A large selection of free schematics is as well available at our website.

Choose your own frequency

PCS ELECTRONICS
www.pcs-electronics.com

89.7 89.9 90.1 *MyMusic* 90.5 90.7

Turn your PC into a Radio Station !

Simply plug a card into your PC and you're ready to broadcast! Lets you control output power and frequency with a simple click of the mouse! Broadcast Mp3s across your yard, gallery, or use it as a small scale community radio.

with PC-MAX ULTRA
the latest from the makers of
the world's 1st commercially
available FM broadcasting
PC transmitter!

This is not all we offer! We also currently stock amplifiers, high-quality links, transmitters, frequency meters, antennas, filters, power supplies, coaxial cable and even some HAM equipment. Sign up for a newsletter to receive special deals and



Check <http://www.pcs-electronics.com>

Check www.pcs-electronics.com!