

PS ENGINEERING[®] INCORPORATED

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PRI30EX Remote Intercom



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Revision, New, June 2013

High-fidelity Stereo Intercom for Remote/Blind mounting
System Installation and Operation Manual
Patented under one or more of the following;
No. 4,941,187; 5,903,227; 6,160,496 and 6,493,450

For use in Experimental/LSA/Non-certified aircraft ONLY
Not intended for installation in aircraft with standard airworthiness certification
**The product warranty is not valid unless this product is installed by an
Authorized PS Engineering dealer.**

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Rev	Date	Change
New	June 2013	New Release

Section I General Information

1.1 Introduction

The **PRI30EX** is a remote-mounted, 4-place high-fidelity stereo intercom system (ICS) designed to integrate with avionics suite and be controlled through a Multifunction display. Please read this manual completely before installation to minimize the risk of damage to the unit and to become familiar with all the features.

The PRI30EX is specifically designed for applications where the intercom is desired to be blind or remotely mounted to free panel space. Only the operating controls are mounted in a location convenient to the flight crew.

1.2 Scope

This manual contains installation and operational instructions for the following PS Engineering unit:

<u>Model</u>	<u>Description</u>	<u>Part Number</u>
PRI30EX (Remote)	Remote 4-place Stereo Intercom	050-310-0101

1.3 Description

The PRI30EX (Remote) is a 4-place remote-mounted intercom with multiple volume and VOX (voice activated squelch) circuits using unified volume and squelch controls that are accessed through an integrated avionics controller, such as an MFD or other EFIS panel.

The PRI30EX has an automatic fail-safe interconnect to the aircraft radios. If power is disrupted to the intercom for any reason, the pilot's headset is connected directly to the aircraft radio allowing continued radio communications in one ear cup.

Provision for entertainment input allows the pilot, copilot and passengers the option to listen to music during flight. During intercom or aircraft radio reception, this music will automatically mute to allow communications without distraction. When the activity ceases, the *SoftMute*[™] circuit gradually returns the music to the original listening volume. By selecting the "Mute" on the MFD, it is possible to have the music remain at a constant level, regardless of any ICS or radio traffic.

During various phases of flight, the degree of importance of the aircraft radio will vary. Because the "ISO" mode connects the pilot directly to the aircraft radio, select the "ISO" mode when the pilot must have top priority on radio transmissions.

Both pilot and copilot have capability to transmit over the radio. The PRI30EX only allows the voice of the person who presses their PTT to be transmitted over the aircraft radio while all other microphones are disabled while the PTT is pressed. If pilot and copilot press the PTT at the same time, the copilot will override. The pilot can regain priority by switching the unit off.

1.4 Approval Basis ****NONE****

The **PRI30EX Remote**, part number 050-310-0101 is not FAA-approved, and **not intended for installation in normal category certificated aircraft.**

1.5 Specifications

Input power: 13.8 - 27.5 Volts DC
Current : < 200 mA (Externally fused at 1 Amp)
Headphone Impedance: 150-1000 Ω (typical)
Audio Distortion: <1.2% @ 50mW into 150 Ω load
Aircraft Radio Impedance: 1000 Ω (typical)
Mic Frequency Response: ± 3 dB, 350 Hz — 6000 Hz
Music Frequency Response: ± 3 dB, 200 Hz – 15 kHz
Unit weight: 12 Ounces (0.34 kg)
Dimensions:
1.25" H x 3.00" W x 5.50" D
(3.2 x 7.6 x 14.0 cm)
Environmental and technical qualifications: RTCA DO-160C/DO-214
Temperature -20° to +55° C

1.6 Equipment required but not supplied

- A. Interconnecting cables as required (custom made harness may be ordered from PS Engineering)
- B. Headphones, 150 Ω stereo, as required
- C. Microphones, general aviation, as required
- D. Interconnect wiring
- E. Circuit Breaker 1 Amp.

1.7 License Requirements

None

Section II Installation

2.1 General Information

The **PRI30EX** (050-310-0101) comes with all mounting hardware and jacks for installation. Installation of the **PRI30EX**, using the hardware supplied and available wiring does not require special tools or knowledge other than described in FAA Advisory Circular 43.13-2B, but to validate the warranty it is required that the unit is installed by a qualified dealer or factory harness is purchased.

2.2 Unpacking and preliminary inspection

The **PRI30EX** (Remote) was carefully inspected mechanically and thoroughly tested electronically before shipment. It should be free of electrical or cosmetic defect.

Upon receipt, verify that the parts kit includes the following:

PRI30EX 050-310-0101 Installation Kit:

Part Number	Description	050-310-0101
425-025-0010	25 pin connector shell male	1
425-020-5090	Female Crimp Sockets	25
625-025-0001	Connector hood	1
475-002-0002	Connector Thumbscrews	2
475-003-0002	Insulated Shoulder Washers	8
475-003-0001	Insulated Flat Washers	8
550-001-0002	Stereo Headphone Jack	4
550-001-0003	Microphone Jack	4
550-008-0001	Music Input Jack 1/8"	1

2.3 Equipment installation procedures

2.3.1 Mounting Requirements

The PRI30EX must be rigidly mounted to the aircraft structure; the unit may be mounted in any area where adequate clearance for the unit and associated wiring bundle exist.

To prevent noise, avoid installing the unit close to high current devices or systems with high-voltage pulse type outputs, such as DME or transponders. Avoid running the interconnecting bundles near any high current wires.

The unit is secured using the four #8 screw holes on the mounting flange. Mounting screws are not supplied.

2.4 Cable harness wiring

To complete the installation, a wire harness must be made as shown in Appendix D.

Note:

PS Engineering can make a custom-tailored wiring harness for the installer. All harnesses use Mil-spec quality components with professional techniques, and are fully tested before shipment. Contact PS Engineering for more information, www.ps-engineering.com or call 865-988-9800.

If the aircraft already has pilot headset jacks installed, you may re-use one mono set for the AUX (radio) jacks but they should be moved to a new location to avoid confusion with the pilot's headphone jacks. In the event the intercom has to be removed for any reason, these jacks provide access to the aircraft radio system. Remove and discard copilot headset jacks if these are monaural.

To connect intercom into the aircraft audio system, parallel the appropriate set of cables from the intercom to the Auxiliary Aircraft Radio Headset Jacks. Finally, install new pilot, copilot and passenger headset jacks into the aircraft and connect them directly to the appropriate pins of the **PRI30EX Remote**. See the wiring diagram for all details of the wire harness interconnect.

2.4.1 Electrical Noise Issues

WARNING: You *must* use individual shielded cables for the microphone and headphone jacks. Combining the microphone and headphone lines inside the same cable WILL cause loud oscillations and degrade the intercom function. The oscillation is caused by the cross-coupling between the large headphone signal and the small microphone signal. The resulting feedback is a high-pitched squeal that varies with the volume control.

Due to the variety of the radio equipment found in today's general aviation aircraft, there is the potential for both radiated and conducted noise interference. The **PRI30EX** has a specially designed power supply to reduce conducted electrical noise on the power bus of the aircraft by at least 50dB. Although this is a very large amount of attenuation, it does not eliminate all noise when the amount is excessive. There must be at least 13.75 Volts DC present at the **PRI30EX** for the power supply to work within its optimum regulation. Otherwise, it will not be able to attenuate noise properly.

Shielding can protect the system from radiated noise (rotating beacon, electric gyros, switching power supplies, etc.). However, installation combinations can occur where minor interference is possible. The **PRI30EX** was designed in an interference-protected chassis and has internal filter capacitors on all input lines.

Ground loop noise occurs when there are two different return paths for the same signal, such as airframe and ground return wire. Large cyclic loads such as strobes, inverters, etc., can inject audible signals onto the airframe return path. Follow the wiring diagram very carefully to help insure a minimum of ground loop potential. Radiated signals can be a factor when low level microphone signals are bundled with current carrying power wires. Keep these cables separated.

Insulating washers are required on all microphone and headphone jacks to isolate them from aircraft ground. The use of a conductor instead of a shield for ground return eliminates these ground loop paths.

2.4.2 Power

The **PRI30EX** was designed to work with 14 or 28 volt DC negative ground systems. The **PRI30EX** must be externally protected with a one ampere (1A) circuit breaker or fuse.

2.4.3 Unswitched Audio Input

The **PRI30EX**, has three unswitched audio inputs available for 510Ω aviation audio sources, and or warnings. Pin 17 is Unswitched #1, and is also provided to the pilot in Fail-Safe Mode. Unswitched #2 input is Pin 4, Unswitched #3 input is Pin 5.

2.4.4 Sidetone

The **PRI30EX** can be modified to produce sidetone (hearing your voice during transmit), if the aircraft radios do not produce it. Contact the PS Engineering factory for details.

2.4.5 Entertainment Input

Stereo entertainment devices can be connected to the **PRI30EX**. Install 1/8" stereo jack in a location convenient the crew to connect the entertainment devices into the system. **PRI30EX**, part number 050-310-0101 has a single entertainment input.

The music device will automatically mute when the ICS or aircraft radio becomes active. The Soft Mute™ feature slowly returns the music to full volume when the activity ceases. On the MFD, selecting the Mute disable will inhibit this feature. Select again to reactivate SoftMute.

2.4.6 Monaural Installations

The PRI30EX can be installed as a monaural intercom. Connect the RIGHT channel to the headsets (this contains failsafe audio). Do NOT combine left and right headphone outputs.

2.5 Post Installation Checkout

After wiring is complete, verify aircraft power is ONLY on pin 13 of the connector, and airframe ground on pin 1. Other voltages may be present on the incoming mic lines. Wiring errors can cause serious internal damage and void PS Engineering's warranty.

1. Apply power to the aircraft and avionics.
2. Plug headsets into the pilot, copilot and passenger positions.
3. Verify that the pilot position can transmit and receive with the **PRI30EX** in the OFF position
4. Switch the PRI30EX on. Verify that the pilot can transmit and receive on the communications transceivers.
5. Verify proper intercom operation for pilot, copilot and passengers.
6. Verify proper transmit and receive operation on the copilot position, noting that the copilot PTT switch allows proper transmission.
7. Verify proper Intercom system operation in the ALL and ISO modes.

Verify that the intercom system does not adversely affect any other aircraft system by systematically switching the unit on and off, while monitoring the other avionics and electrical equipment on the aircraft.

Section III OPERATION

TBD. This is dependent upon the EFIS operation, and the responsibility of the system integrator.

The following commands are available to the integrator:

Intercom Volume

Intercom Squelch Threshold

Isolate/ALL Intercom Mode

Power on Status

Radio PTT Status.

Music Mute Control

Section IV – Warranty and Service

4.1 Warranty

In order for the factory warranty to be valid, the installations in a certified aircraft must be accomplished by an FAA-certified avionics shop and authorized PS Engineering dealer. If the unit is being installed by a non-certified individual for experimental aircraft, a factory-made harness must be used for the warranty to be valid.

PS Engineering, Inc. warrants this product to be free from defect in material and workmanship for a period of one year from the date of sale. During this one-year warranty period, PS Engineering, Inc., at its option, will send a replacement unit at our expense if the unit should be determined to be defective after consultation with a factory technician.

This warranty is not transferable. Any implied warranties expire at the expiration date of this warranty. PS Engineering SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. This warranty does not cover a defect that has resulted from improper or unreasonable use or maintenance as determined by us. This warranty is void if there is any attempt to disassemble this product without factory authorization. This warranty gives you specific legal rights, and you may also have other rights, which may vary from state to state. Some states do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation or exclusions may not apply to you.

4.2 Factory Service

The **PRI30EX (050-310-0101)** is covered by a one-year limited warranty. See warranty information above for details.

Call PS Engineering, Inc. at (865) 988-9800 before you return the unit. This will allow the service technician to provide any other suggestions for identifying the problem and recommend possible solutions.

After discussing the problem with the technician and it's decided the unit needs to be returned to PS Engineering for service, the technician will provide RMA # (Return Authorization Number). Write this number on the outside shipping container.

Units that arrive for repair without an RMA are subject to return unrepaired. Also method of payment is required before commencing work.

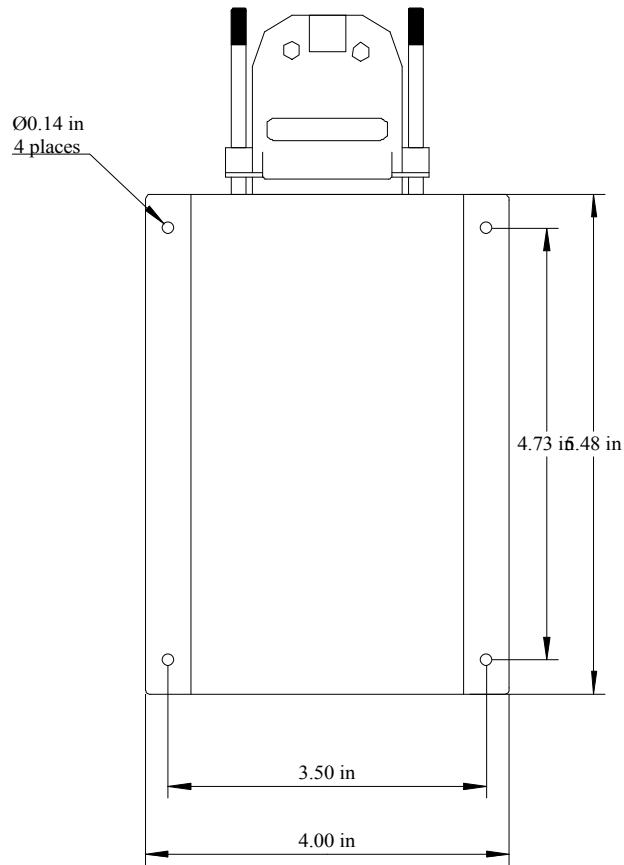
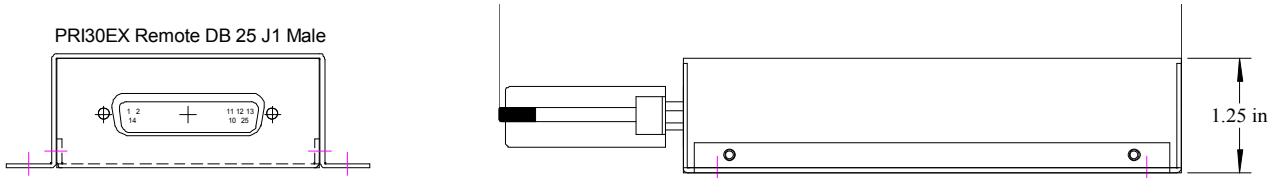
Address below:

NOTE: PS Engineering will not be responsible for any units sent by US Mail and PS Engineering will not return shipment by US Mail.

PS Engineering, Inc.
Service Department- RMA# _____
9800 Martel Road
Lenoir City, TN 37772
(865) 988-9800 FAX (865) 988-6619

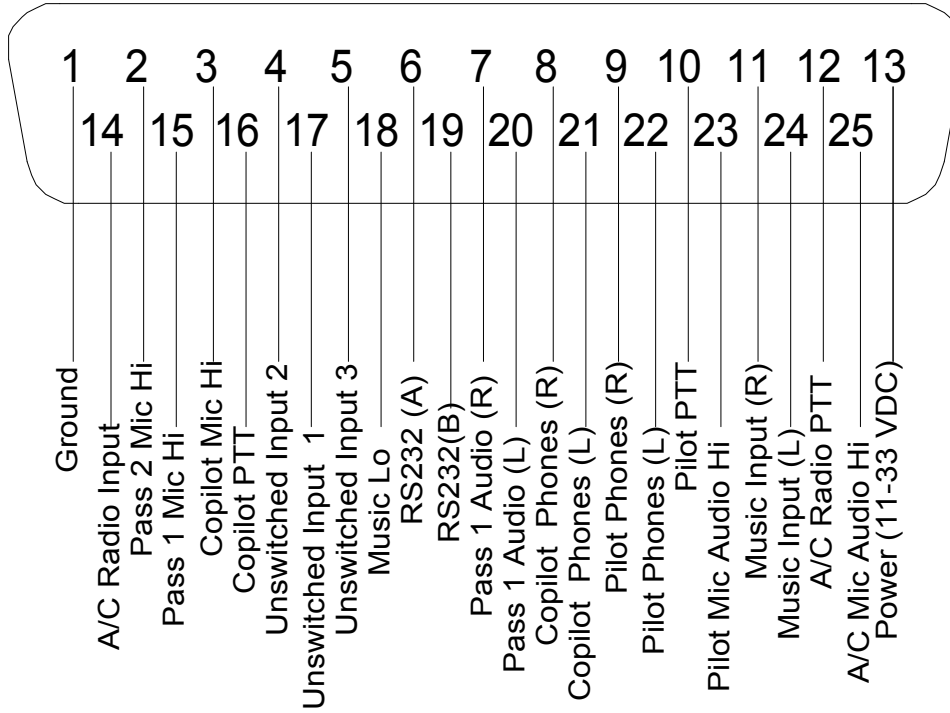
Information is also available by visiting www.ps-engineering.com/support.shtml

Appendix A – PRI30EX (050-310-0101) Installation Drawings



Not to scale

Appendix B, Connector Description



Harness Front Connector View
J1 25-pin Female Sockets

Appendix C – PRI30EX Connector Interconnect

