DATA COMM FOR BUSINESS

PAS v2

Priority Audio Switch

User's Guide

Version 2, Revision C

Revised Nov 25, 2019

Version 2.0c

TABLE OF CONTENTS

Certifications

FCC Statement

This device complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules.

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

RoHS

Some models of this product are available in RoHS versions.

Chapter 1
Introduction

This chapter provides an overview of the PAS features and capabilities.

The Priority Audio Switch (PAS) is designed to be installed between a transmitter site and two control operator positions so they can share a single transmitter. The PAS takes in two 4-wire audio lines each with a Push-to-Talk (PTT) lead where PTT is activated by shorting this lead to ground. The ports are designated as Priority and Secondary. The Priority port will seize control of the audio channel when its PTT lead is shorted to ground, otherwise the Secondary ports audio channel and PTT state are passed through to the output port.

The PAS contains two completely isolated instances of the priority switching function.

The standard PAS is powered by 48VDC, which matches most telco systems. External power supplies are available for AC or other DC power operations.

Receive audio and other return leads from the transmitter are always passed back to both controllers.

Input Ports   Power and Output Ports

Package Contents

You should find the following items packaged with your PAS product:
- The PAS unit
- Optional power supply (if ordered)
- If any of the above are missing, contact your dealer immediately.

PAS Hardware Specifications

Connectors
- One 48 VDC power port
- Four RJ-45 audio input ports
- Two RJ-45 audio output ports
- Two audio input ports are paired with each audio output port

Controls
- There are no user software controls. The unit is operational upon power application.

Environmental
- Operation: -25° C to +65° C, non condensing humidity

Physical / Electrical
- 5 ¼ x 5 ½ x 1 ¾ Inches
- Power requirements: 48 VDC, which may be supplied by a 120 VAC power adapter
- One pound unit weight

Chapter 2
Installation and Configuration

Overview

The PAS is connected between two audio sources and a single audio receiving device. There are two instances of this operation, and they may be cascaded to allow for three inputs to a single transmitter, or used independently with two inputs to each of two transmitters. It is usually installed at a transmitter site to allow automatic operation by multiple control operators of the transmitter.

All connections to the PAS use RJ-45 connectors or the power connector screw terminals.

Audio Source Connections:
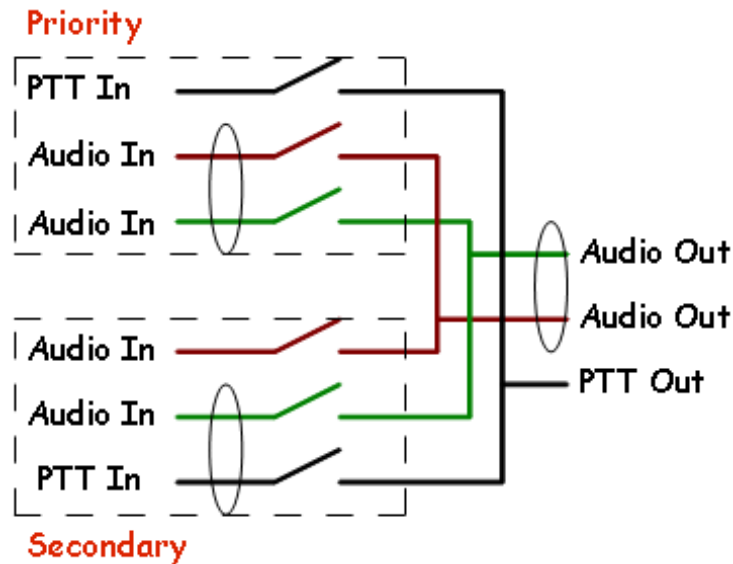
Switched Transmit Audio Flow

Received audio from the transmitter is always passed to pins 3 & 6 of both priority and secondary devices.
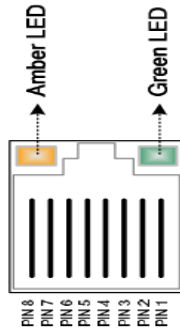
Chapter 3

Connectors

Power Connector

Green screw connector (numbered right to left)

Pin 1   -48 VDC
Pin 2   Chassis ground
Pin 3   +48 VDC

RJ-45 E&M Connection Pin-outs

The following table shows the PRIMARY, SECONDARY and OUTPUT port pin assignments. The OUTPUT port Audio Out signals on pins 1 and 2 are switched between PRIMARY and SECONDARY port based on the PRIMARY port PTT (E1) input on pin 4. The two right most columns show the OUTPUT signals when PRIMARY PTT input is OPEN and SHORTED to GND.

PRIMARY	RJ45		RJ45	OUTPUT PRI PTT (E1) Open	OUTPUT PRI PTT (E1) GND
Audio In (R1)	1		1	Audio Out (R2)	Audio Out (R1)
Audio In (T1)	2		2	Audio Out (T2)	Audio Out (T1)
Audio Out (R)	3		3	Audio In (R)	Audio In (R)
PTT In (E1)	4		4	PTT Out (E2)	PTT Out (E1) GND
SG/EB (GND)	5		5	SG/EB (GND)	SG/EB (GND)
Audio Out (T)	6		6	Audio In (T)	Audio In (T)
M	7		7	M	M
SB/MB	8		8	SB/MB	SB/MB
SECONDARY	RJ45				
Audio In (R2)	1				
Audio In (T2)	2				
Audio Out (R)	3				
PTT In (E2)	4				
SG/EB (GND)	5				
Audio Out (T)	6				
M	7				
SB/MB	8				

Revision A&B RJ45 Pin Assignments

This table shows the current RJ45 pin numbers in the left hand column and the older Rev B pin numbers in the far right column. The signal directions are noted in the PRI/SEC and OUTPUT columns. **This table is included only for reference with products produced prior to Revision C. Do not use this table unless you are replacing a previous version and connecting the older PAS cables to a Revision C unit.**

Rev C RJ45	Signal	PRI/SEC	OUTPUT	Rev B RJ45
1	Audio In (R1)	IN	OUT	6
2	Audio In (T1)	IN	OUT	3
3	Audio Out (R)	OUT	IN	5
4	PTT (E)	IN	OUT	7
5	SG/EB (GND)	GND	GND	8
6	Audio Out (T)	OUT	IN	4
7	M	OUT	IN	2
8	SB/MB	OUT	IN	1

Connection details

The PAS was originally designed to be placed in between a Loop channel bank and a transmitter connected to it via an E&M Card.

Loop Telecom channel banks (V4200, AM3440, O9500, O9550, IP6704A) with 8EM, 8EMA or QEMA cards

To connect a Loop channel bank E&M card (LEM) to the priority and/or secondary ports of the PAS, configure the LEM to operate in B-Side mode and connect with the proper RJ45 cable.

To connect to a LEM on the output side port of the PAS, configure the LEM card to operate in A-Side mode and connect with the proper RJ45 cable.

Since the PAS always uses the "E lead" for PTT indicator and E-Lead PTT is always done via connection to ground, all E&M types are supported in LEM and will pass through the PAS when the LEM cards are properly configured for A-side and B-side.

Charles Industries channel banks with 3652-80 and 3652-81 E&M Cards

To connect to a Charles channel Bank E&M card (CIEM), build an RJ45 cable that connects to the specific pins on the 50 pin Telco connector (or connectors for 3252-80) for the channels that you wish to use.

To connect a CIEM to the priority and secondary ports of the PAS connect the following pins to the pins in a straight-through fashion. That is M to M, R to R, etc. The pattern is:

Pin 8 to MB, Pin 7 to M, Pin 2 to T1, Pin 6 to T, Pin 3 to R, Pin 1 to R1, Pin 4 to E and Pin 5 to EB

If you are connecting a CIEM to the output side ports of the PAS, then you must cross over the signals and you can only use E&M Types 4 & 5. This is because CIEM can only accept PTT input on the M-Lead, the PAS only can only signal PTT by closure to ground, and E&M types 4 & 5 are the only E&M types where PTT is signaled by closure to ground on the M lead. The pattern is:

Pin 8 to EB, Pin 7 to E, Pin 2 to T, Pin 6 to T1, Pin 3 to R1, Pin 1 to R, Pin 4 to M and Pin 5 to MB

Other channel banks

Connections to other channel banks and E&M devices can be made by following the directions of the signals in the chart above to connect to your device. Remember that the PAS input ports can only use closure to ground to detect PTT and the unit passes the PTT state out only via closure to ground. This required that choose an appropriate E&M type that signals PTT or accepts PTT based on closure to ground.

Grounding

Remember that grounding is critical with E&M signaling, so you must either connect the PAS using the center pin of the power supply terminal to the same ground plane as your other equipment (when using E&M type 1 or E&M type 5) or you must connect pin 5 of the RJ45 (SG or EB lead) to the ground plane of your equipment (When using E&M type 2-4).

Chapter 4

Operation

This chapter explains how to use the PAS.

Common Uses

 The application below shows the PAS used with Loop AM3440 channel banks for remote control of a transceiver from two different locations. Push to talk at the controller positions on the left is passed across the link using E&M signaling. One of the two positions is priority, the other one is secondary. The receive audio is always passed back from the radio to both controllers.

Two dispatch positions share one radio with the DCB Priority Audio Switch
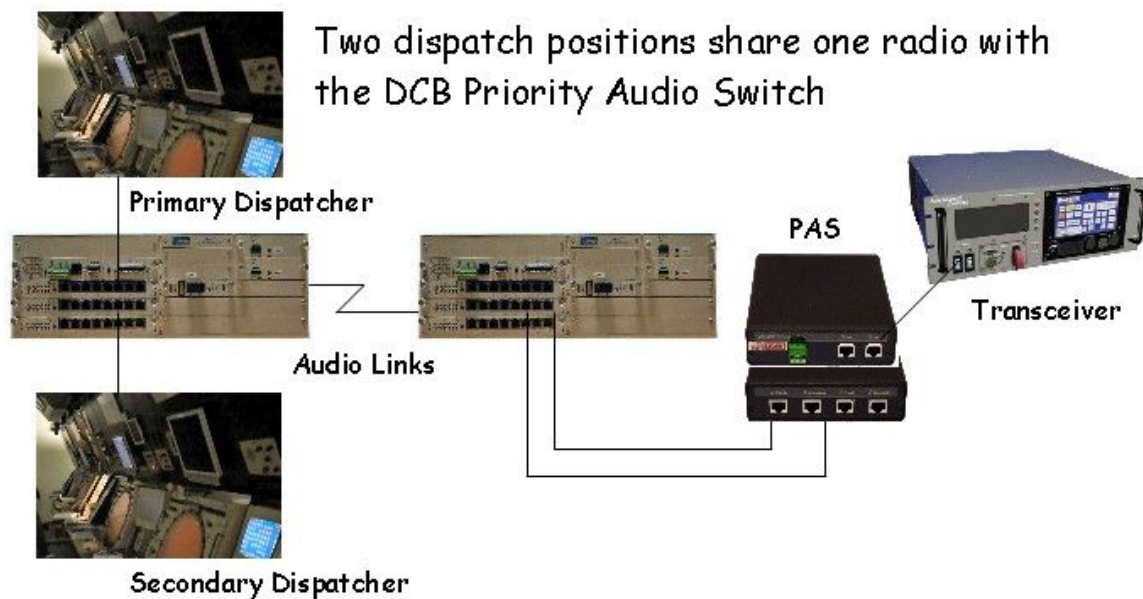
Operation Details

OUT Pins 6 and 3 are always bridged to both PRIORITY and SECONDARY pins 6 and 3. This allows audio input from the OUT port to flow back to the PRIORITY and SECONDARY port.

OUT pins 8 and 7 are also always bridged to both PRIORITY and SECONDARY input pins 8 and 7. This is allows M and SB/MB leads from the OUT side to flow back to the PRIORITY and SECONDARY port..

While PRIORITY port pin 4 is grounded to chassis (PTT activated), OUT pin 4 is grounded to chassis (PTT to the transmitter), PRIORITY pins 2and 1 are connected to OUT pins 2 and 1(audio input from the PRIORITY port sent to the transmitter).

While PRIORITY port pin 4 is open (PTT not activated), OUT pin 4 is connected to SECONDARY pin 4 (forwarding the state of the SECONDARY PTT), and SECONDARY pin 2 and 1 are connected to OUT pins 2 and 1 (audio input from the SECONDARY port sent to the transmitter)

Note:

When the PAS is un-powered, the audio path from secondary is connected to the output. It becomes a pass-through of the secondary port in the event of power loss.

Cascaded PAS

The two "sides" of a PAS may be combined to make a three-input/one-output PAS instead of two independent two-input/one-output unit.

Connect a RJ45 straight-through cable from 1-OUT to 2-SECONDARY. Connect a RJ45 cable between OUT-2 and the transmitter.

Port 2 PRIORITY now has the highest precedence and will always assert audio control if pin 4 of this port is grounded.

Port 1 PRIORITY has the next highest precedence and will assert audio control if pin 4 of this port is grounded and port 2 PRIORITY is not.

Port 1 SECONDARY will the the default port and it will pass its pin4 state and audio unless one of the other ports is grounded.

Indicator LED's

The PAS is equipped with green and amber LED lights next to each PRIORITY and SECONDARY port.. When the unit is powered on and the PRIORITY port is not keyed the green LED light next each SECONDARY RJ45 port will be illuminated. When either PRIORITY port is keyed then the green LED light next to that PRIORITY RJ45 will illuminate and the SECONDARY RJ45 light will go out. The amber LED lights are not used.

Chapter 5

Troubleshooting

This chapter explains how to troubleshoot the PAS.

If the PAS does not function properly, please contact your dealer for further assistance.

Hardware Problems

Before anything else, check that all cables are wired correctly and properly connected and make sure you have proper grounding for all equipment.

Since this is a specialty device and should be deployed by knowledgeable technicians, please contact DCB technical support if there is any problem installing or maintaining the unit.

Appendix A
Specifications

PAS Specification

- One 48 VDC power port

- Two RJ-45 input connectors for each channel (total of 4)

- One RJ-45 output connector for each channel (total of 2)

- Environmental: Operation -25° C to +65° C C non-condensing humidity

- Dimensions: 5 1/4" x 5 ½" x 1 3/4"

- Power: 48 VDC

Appendix B

Warranty

DCB Product Two Year Limited Warranty

DCB products are warranted to be free of defects in materials and workmanship for two years. Data Comm for Business, Inc. will repair or replace any equipment proven to be defective within the warranty period. All warranty work is F.O.B. Dewey, IL. This warranty is exclusive of abuse, misuse, accidental damage, acts of God or consequential damages, etc. DCB liability shall not exceed the original purchase price.

All equipment returned for repair must be accompanied by a Returned Material Authorization (RMA) number. To receive an RMA number, call (217) 897-6600 between the hours of 8 AM and 5 PM Central Time. Equipment must be shipped prepaid to DCB and will be returned at DCB's expense.
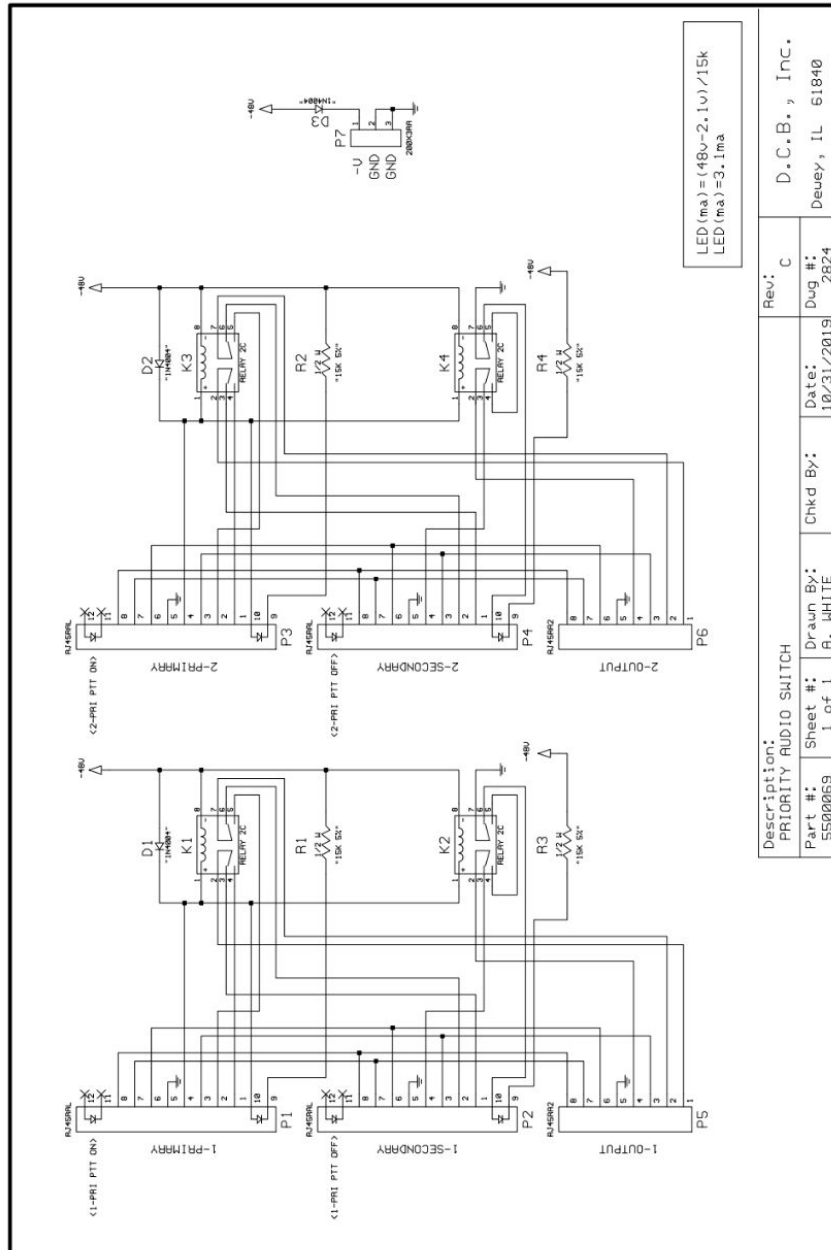

Ship returned items to:

Data Comm for Business

2949 County Road 1000E

Dewey, IL 61840

ATTN: RMA#

Appendix C

Schematic

Revision C Reference Schematic

Appendix D

Accessories

Mounting Options

The PAS has an optional front bezel / shelf that can be used to mount either 1 or 3 PAS units in a 1U 19 inch rack space.

Order part number 9902095 to hold 3 PAS and 9902096 for single unit.

An AC to DC adapter for a single unit (300mA) .is available as part number 9001176

A single AC adapter that can be used with 3 units (1.3A) is part number *TBD*