

OPERATING INSTRUCTIONS

for the

REMOTE ALARM PANEL



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Safety:

Please use proper handling procedures when working with Liquid Nitrogen. It is an extremely cold refrigerant and can cause serious injury. Also, the liquefied gas can cause asphyxiation in a confined area so be sure that all confined areas have adequate ventilation. For detailed information on the handling of cryogenic liquids, refer to the publication: P12 "Safe Handling of Cryogenic Liquids" available from the Compressed Gas Association Inc., 1235 Jefferson Davis Highway, Arlington, VA 22202.

Introduction:

The Pacer Digital Systems Remote Alarm Panel was developed for use with the Taylor-Wharton Kryos Cryogenic Control System. This product provides the capability to monitor Cryo-Storage Systems, the Tank Switcher and the Fill Sequencer from a remote on-site location.

Hardware Requirements:

- RAP-2 – Remote Alarm Panel for 2 circuits
- Wall plate with telephone jack modules to connect to RAP
- 9 VDC Wall Transformer
- Wall plate with 2 binding posts for connection into the wall
- Remote Alarm Plugs with connectors
- Extension Wires w/ connectors for serial wiring of Cryo-Storage systems
- Telephone wire to connect lab with Cryo-Storage systems to office with RAP
- Standard telephone cord(s) – 6-pin type

Installation:

The Remote Alarm Panel (RAP) should be mounted to a wall using the supplied screws or double-sided adhesive strips. It should be located near the personnel whom are responsible for the cryogenic freezers. It should also be easily accessible as it has buttons to mute the alarm beeper. Make sure that it is within 6 feet of an AC power outlet so the supplied transformer's cord will reach.

The Remote Alarm Panel comes supplied with three wall plates. The first uses telephone jack modules and will be located in the same room as the RAP. The other two contain binding posts and will be located at each of the locations where devices are being monitored. The wall plate at the location of the RAP will be connected to the other wall plates using twisted pair telephone wire. This is done by going through the walls of the facility. A run of paired wire is needed from the RAP wall plate to the first location's wall plate. Also, a separate run of paired wire is needed from the RAP wall plate to the other location's wall plate.

Determine where the wall plates are going to be situated in each of the locations. Measure and cut the lengths of telephone wire needed to connect the RAP location to the location(s) of the devices. Make sure to leave a few extra feet of wire so there is no strain on the wire.

Use different color wire pairs for each location and note which color goes where to avoid confusion later.

The wall plate with the telephone jack modules allows for easy connection to the Remote Alarm Panel. Determine which telephone jack will correspond to each location.

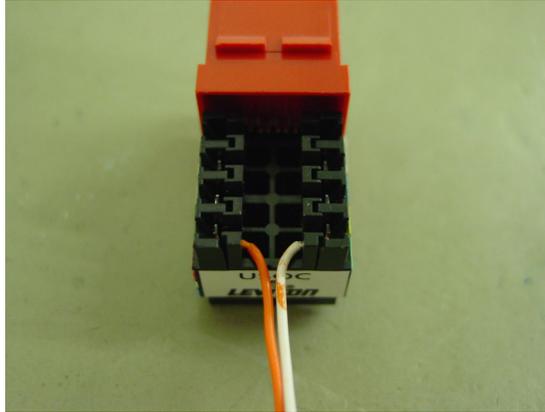


Figure 1

Use a standard punchdown tool to connect the pair of telephone wire ends to the back of the module. The wires must be connected to pins 3 and 4 of the module. See Figure 1. **The RAP will not function properly if the center two pins of module are not used.** It does not matter which wire is connected to either side. Place the supplied black cover over the back of the module after the wires are punched down. Insert the module into one of the openings on the wall plate. Repeat this procedure for the other module. The wall plate can now be mounted into the wall.

Connect the wall plate to the Remote Alarm Panel using a standard telephone cord. Once again, make sure that the connections for each alarm correspond to the location being monitored.

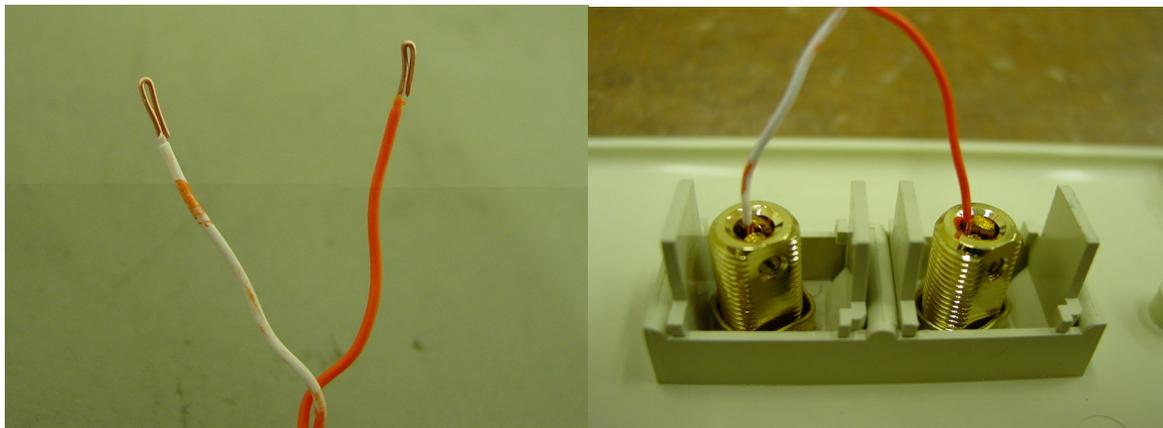


Figure 2

The wall plates that are located near the devices to be monitored are supplied with binding posts. The rear side of this plate must be connected to the telephone wire pair coming from the location of the RAP. Once the wire ends are stripped, they should be doubled over. See the left had picture in Figure 2. This will ensure a better connection to the binding

posts. Next, insert the wires into the opening on the rear of the binding posts. It does not matter which wire goes to either post. Use a small screwdriver to firmly tighten the lock-down screws onto the bare ends of the wires. Afterwards, give the wires a slight tug to make sure they will not come loose. See the right hand picture in Figure 2. The wall plate can now be mounted into the wall.

The other side of these wall plates has gold binding posts. Each post has a wire with a connector attached to it. Using the supplied extension wires, make the connections between these connectors and each the devices' remote alarm plugs. This should form a chain between all devices starting at one binding post and ending at the other.

See the Example Diagram included with these instructions to better understand the layout of the wiring hookup.

Remote Alarm Panel General Operation:

The Remote Alarm Panel uses a 9 VDC wall transformer. Plug this into the power jack on the panel. The RAP will begin monitoring the connected devices. An open circuit signals to the RAP that an error has occurred, while a closed circuit signals to the RAP that conditions are fine. The devices being monitored all use a relay to tell the RAP that an error has occurred. If an error does occur, the relay on the freezer or other device will create an open circuit. When the RAP detects the open circuit, the audible alarm sounds and the fault light starts flashing. The audible alarm can be muted by pressing the button located below the fault light. However, the visual alarm will continue to flash until the error condition is corrected.

All products made by Pacer Digital Systems' have a relay to signal a remote alarm. The relays are wired such that a power failure causes the relay to switch into an alarm condition. A power failure will cause the Kryos control systems, the Fill Sequencer or the Tank Switcher to go into alarm. The RAP detects this failure and goes into alarm.

Frequently Asked Questions:

Q: Can I monitor more than two locations of devices with a Remote Alarm Panel?

A: Yes, but the remote alarm panel must be ordered from Pacer with the proper number of ports for monitoring. Each port can monitor a specific location. The maximum number of ports that can be installed per RAP is 4.

Q: What is the maximum distance that can separate the RAP from the locations being monitored?

A: The maximum distance is approximately 1000 feet. The greater the distance, the possibility of noise interference increases.

Q: Can I connect other devices other than Pacer products?

A: Yes, any device that can make or break a circuit can be connected to the RAP.

Specifications:

Power Source:

- 9 VDC

Control System Compatibility:

- Taylor-Wharton Kryos Control System.
- Pacer Digital Systems Fill Sequencer.
- Pacer Digital Systems Tank Switcher.
- Pacer Digital Systems Pacer 2L control.
- Pacer Digital Systems Cryo-Sentry Low Level Alarm.
- Pacer Digital Systems Mark II control.

Alarms:

- Flashing Fault Light
- Audible Beeper

Dimensions:

- 5" wide x 7 3/8" deep x 1 1/8" high

Weight:

- Less than 1 lb.

Maximum Number of devices per RAP:

- 4 devices or chain of devices that can provide a make / break of a circuit.

Warranty

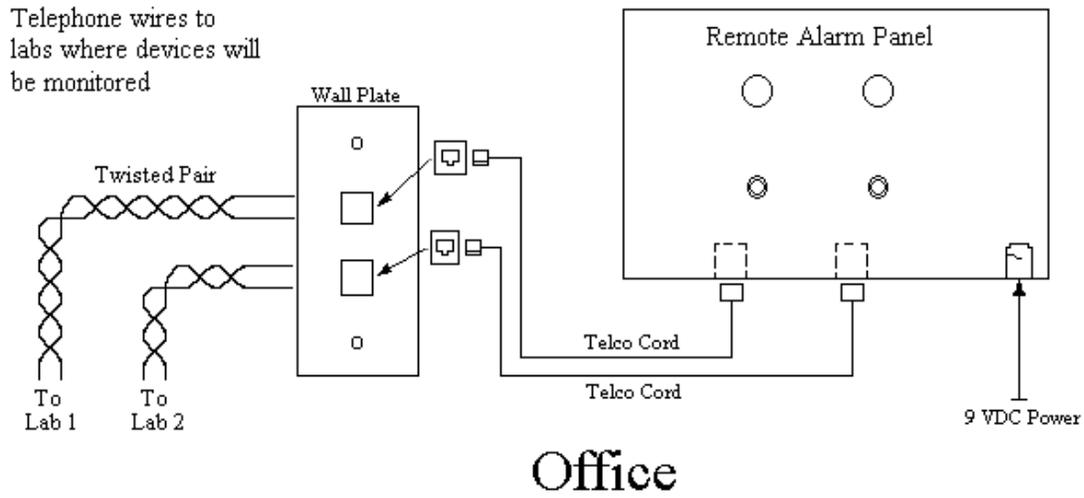
Pacer Digital Systems, Inc.

Pacer Digital Systems, Inc. warrants that each of its electronic control products will be free from defects in material and workmanship, in the normal service for which the product was manufactured, for a period of two years from the date of purchase. Pacer Digital Systems, Inc. at its option will either repair or replace any item covered under this warranty.

This warranty is void if the product is used for any other purpose than that for which it was designed, including but not limited to connection with third party systems. This warranty is also void if the product is in any way altered or repaired by others. Pacer Digital Systems, Inc. shall not be liable under this warranty, or otherwise, for defects caused by negligence, abuse or misuse of this product, corrosion, fire or the effects of normal wear.

The remedies set forth herein are exclusive. Pacer Digital Systems, Inc. shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products, resulting from the delivery, use or failure of the product or for any other cause. By accepting delivery of the product, the purchaser acknowledges that this limitation of remedies is reasonable and enforceable. In no case shall Pacer Digital Systems, Inc.'s liability exceed the purchase price for the product.

Example Diagram of Remote Alarm Panel (RAP)



Labs

Each wall plate with binding posts can monitor 1 device or multiple devices.

