RCP-GPI/RCP-JS Panel Operational Description

Document Number 81-9059-0557-0 Revision B

Table of Contents

Introduction

RCP-GPI and RCP-JS control panels are highly configurable pushbutton panels that allow access to 131 pushbutton functions as well as 16 General Purpose Inputs (GPIs).

The 3500Pro Controller controls the RCP-GPI and the RCP-JS control panels. Operation of these panels requires that they be configured at the system controller utilizing the 3500Pro Configuration Editor. Refer to the Operations Section of the 3500Pro Control System Manual for detailed configuration instructions.

All RCP-GPI and RCP-JS control panels in a routing switcher system are custom configured at the factory prior to shipment. The information needed to configure the control panels comes from the System Design Guide filled out by the customer. However, if the system configuration changes, the RCP-GPI and RCP-JS panels can be re-configured on site using the 3500Pro control system configuration software.

Panel Interface Connections

The following details how to connect the control panel in order to communicate with the 3500Pro controller and external GPI devices.

- Install the equipment in the rack before connecting cables.

- All cables should be carefully strain relieved to prevent connector separation.

- To the extent possible, separate control signal, and power cables to minimize crosstalk and interference.

- The liberal use of nylon cable ties to secure cables to the rack is encouraged. This will minimize the amount of force transmitted to the equipment and help route cables away from hazardous areas.

- Route cables away from walk areas to avoid creating a safety hazard.

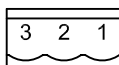## *RS-485 Serial Communication Connector (CONTROL PORT)*

This 3-contact connector provides an RS-485 serial communication interface using the PESA RCP Protocol (Document No. 81-9062-0300-0).
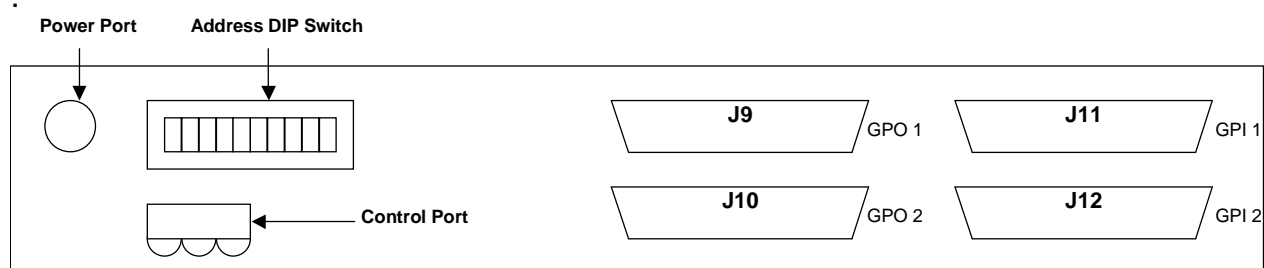
CONTROL PORT is connected to a PESA system controller with a cable constructed with a 3-contact connector (Part No. 81-9029-0780-0) and shielded, twisted-pair audio cable (Part No. 81-9028-0043-2, Belden 8451, or equivalent) as shown in **Error! Reference source not found.**. The connector body has an integral strain relief which requires the use of a nylon cable tie that is included with the connector. If this cable tie is not available, Part No. 81-9021-0028-8 may be used.

> ## NOTE
> It is not necessary to remove power from the remote control panel prior to connecting or disconnecting the RS-485 serial communication cable.

Contact locations when viewed
from rear of chassis.

CONTROL PORT Connector
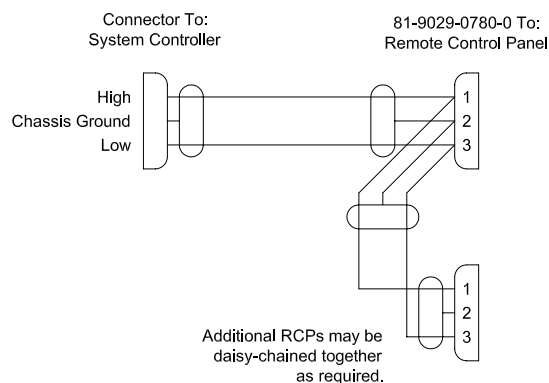
RS-485 Serial Communication Cable

Power Connector

POWER IN is connected to the external power adapter provided with the remote control panel. The power adapter has an integral cable assembly with a push-on connector.

POWER IN Connector

GPI Connectors

The RCP-GPI/RCP-JS panels have 16 GPI's that are user configurable. The GPI's are available on the **female 37 pin D connectors** (J11, J12) on the back of the panel.
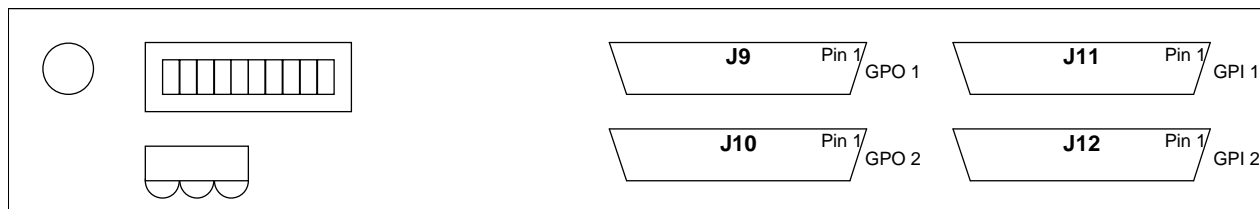
The circuit for the GPI's uses an opto-isolated input circuit.   The circuit is pulled to the panel common to activate the GPI.
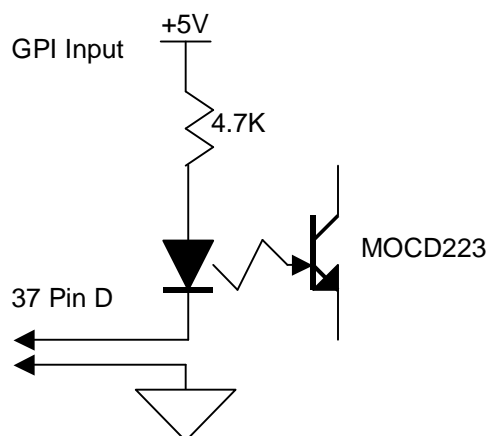
The connections for the GPI's are as follows:

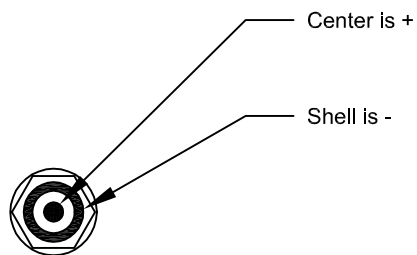| Pin Function	Connector Assignment
GPI #1	J11 pin 21
GPI #2	J11 pin 22
GPI #3	J11 pin 23
GPI #4	J11 pin 24
GPI #5	J11 pin 25
GPI #6	J11 pin 26
GPI #7	J11 pin 27
GPI #8	J11 pin 28
GPI #9	J12 pin 21
GPI #10	J12 pin 22
GPI #11	J12 pin 23
GPI #12	J12 pin 24
GPI #13	J12 pin 25
GPI #14	J12 pin 26
GPI #15	J12 pin 27
GPI #16	J12 pin 28
Common	J11 Pins 29-37, J12 Pins 29-37

GPO and Pushbutton Mirror Connectors

In addition to the GPI's, the panel also has 16 General Purpose Outputs (GPO) as well as a mirror to all the panel pushbuttons and their associated LED Tally.

The GPO's are currently unused by any panel functionality.

The mirrored pushbutton inputs and LED tally allow for remote access to the panel's front pushbuttons. The circuit for pushbutton inputs is the same as that used for the GPI's.

The GPO's and LED Tally mirrors use an opto-isolated output circuit. (The LED tally uses the same circuit)

GPO

+5V

1A   37 Pin D

MOCD223
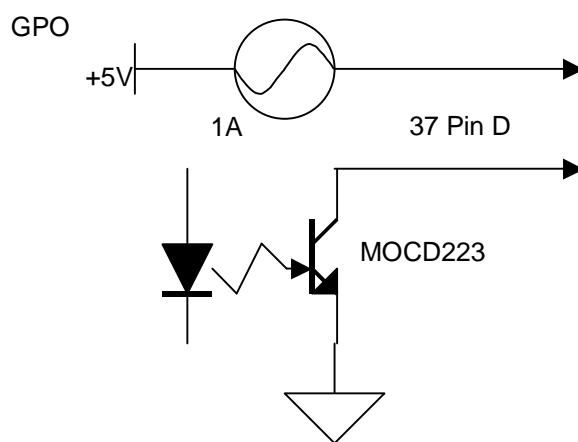
The pushbutton mappings for the GPO via the 37 pin connectors is:

GPO	Output Connector Assignment
GPO #1	J9 pin 21
GPO #2	J9 pin 22
GPO #3	J9 pin 23
GPO #4	J9 pin 24
GPO #5	J9 pin 25
GPO #6	J9 pin 26
GPO #7	J9 pin 27
GPO #8	J9 pin 28
GPO #9	J10 pin 21
GPO #10	J10 pin 22
GPO #11	J10 pin 23
GPO #12	J10 pin 24
GPO #13	J10 pin 25
GPO #14	J10 pin 26
GPO #15	J10 pin 27
GPO #16	J10 pin 28
Common	J9 Pins 33-37, J10 Pins 33-37
+5V (1A fused total)	J9 Pins 29-32, J10 Pins 29-32

The following table maps the pushbutton key functions to the physical pushbuttons (both pushbutton functions and LED tally). See the operational description section for functional details of the pushbuttons.

Pushbutton Function	PB Input Connector Assignment	LED Output Connector Assignment
** Data Key 1,33,65,97	J11 pin 1	J9 pin 1
** Data Key 2,34,66,98	J11 pin 2	J9 pin 2
** Data Key 3,35,67,99	J11 pin 3	J9 pin 3
** Data Key 4,36,68,100	J11 pin 4	J9 pin 4
** Data Key 5,37,69,101	J11 pin 5	J9 pin 5
** Data Key 6,38,70,102	J11 pin 6	J9 pin 6
** Data Key 7,39,71,103	J11 pin 7	J9 pin 7
** Data Key 8,40,72,104	J11 pin 8	J9 pin 8
** Data Key 9,41,73,105	J11 pin 9	J9 pin 9
** Data Key 10,42,74,106	J11 pin 10	J9 pin 10
** Data Key 11,43,75,107	J11 pin 11	J9 pin 11
** Data Key 12,44,76,108	J11 pin 12	J9 pin 12
** Data Key 13,45,77,109	J11 pin 13	J9 pin 13
** Data Key 14,46,78,110	J11 pin 14	J9 pin 14
** Data Key 15,47,79,111	J11 pin 15	J9 pin 15
** Data Key 16,48,80,112	J11 pin 16	J9 pin 16
** Data Key 17,49,81,113	J12 pin 1	J10 pin 1
** Data Key 18,50,82,114	J12 pin 2	J10 pin 2
** Data Key 19,51,83,115	J12 pin 3	J10 pin 3
** Data Key 20,52,84,116	J12 pin 4	J10 pin 4
** Data Key 21,53,85,117	J12 pin 5	J10 pin 5
** Data Key 22,54,86,118	J12 pin 6	J10 pin 6
** Data Key 23,55,87,119	J12 pin 7	J10 pin 7
** Data Key 24,56,88,120	J12 pin 8	J10 pin 8
** Data Key 25,57,89,121	J12 pin 9	J10 pin 9
** Data Key 26,58,90,122	J12 pin 10	J10 pin 10
** Data Key 27,59,91,123	J12 pin 11	J10 pin 11
** Data Key 28,60,92,124	J12 pin 12	J10 pin 12
** Data Key 29,61,93,125	J12 pin 13	J10 pin 13
** Data Key 30,62,94,126	J12 pin 14	J10 pin 14
** Data Key 31,63,95,127	J12 pin 15	J10 pin 15
** Data Key 32,64,96,128	J12 pin 16	J10 pin 16
Data Key 129	J12pin 17	J10pin 17
Data Key 130	J12 pin 18	J10 pin 18
Data Key 131	J12 pin 19	J10 pin 19
Page 1	J11 pin 17	J9 pin 17
Page 2	J11 pin 18	J9 pin 18
Page 3	J11 pin 19	J9 pin 19
Page 4/Address	J11 pin 20	J9 pin 20
Protect/Lock	J12 pin 20	J10 pin 20

** - 32 physical keys are arranged in 4 banks that represent data keys 1-128. (See operational description for more details.)

Switch and Jumper Settings

Panel Address DIP Switch

The 10-position DIP switch on the back of the panel is used to set the unique panel address required by every remote control panel in a switching system.
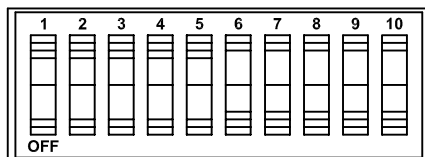
Switch locations when viewed
from rear of chassis.

Panel Address DIP Switch

The panel address is set as follows:

1. Select a unique address to be assigned to the panel.
2. Convert the address to 10-position binary format.
3. Using 1 = ON and 0 = OFF, use the switches to enter the binary address.

Example:

Panel address will be 185

185 is 0 0 1 0 1 1 1 0 0 1 in 10-position binary format

Set the switches as shown in Table 1

Table 1. Sample DIP Switch Setting for Panel Address 185

1	2	3	4	5	6	7	8	9	10
OFF	OFF	ON	OFF	ON	ON	ON	OFF	OFF	ON

RCP-GPI/RCP-JS Operation

The RCP-GPI/RCP-JS control panels are pushbutton panels with the added ability of handling GPI inputs. The RCP-GPI/RCP-JS panels allow for fast access to router status and the ability to take switches quickly and simply.

In addition to the pushbutton access in the front, the panels are equipped with GPI access in the rear to automate control via the panel interface.

Display

```
DEST        SOURCE
LEVEL       PAGE
```

The RCP-GPI/RCP-JS control panels are equipped with a 2x20 character display. The display shows the destination being controlled by panel (referred to as the panel's current destination) shows switch status for the destination, and displays the breakaway mode of the panel. It also shows the current page of the data keys on the left hand side of the panel.

Key Types

The RCP-GPI/RCP-JS control panels are come equipped with 40 pushbuttons and 16 General Purpose Inputs (GPIs).
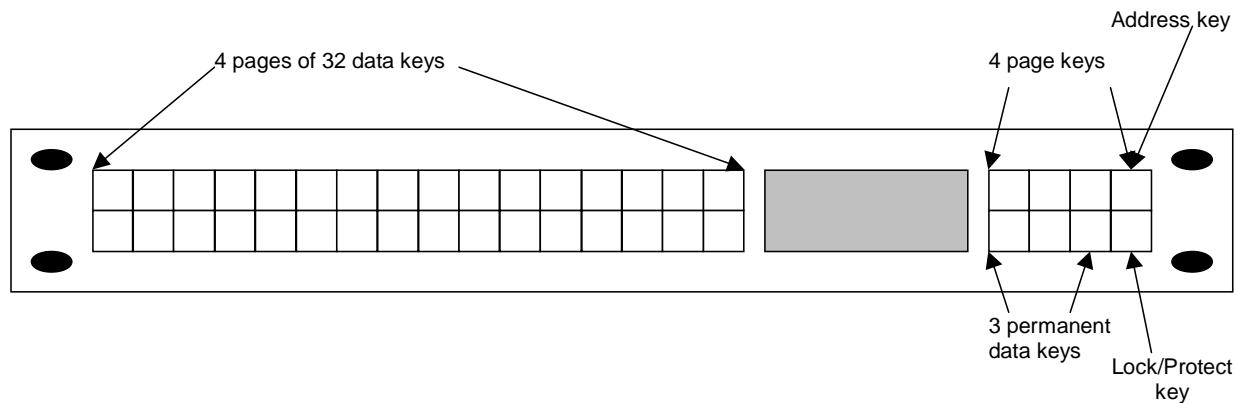
The pushbuttons are configured so that there are 32 data keys on the left, 4 page keys on the top right, 3 permanent data keys on the bottom right, and the lock/protect function key.

The 32 data keys on the left are user configurable in 4 pages so that the user can have access to 128 total functional data keys. The data keys can be configured to represent a router source, destination, or level of control or left unconfigured.

The pages of keys are accessible by pressing one of the 4 page keys on the type right of the panel. The page key that is lit indicates the page that is currently active.

(If none of the data keys on a page are configured, then the page is not accessible.)

In addition to the 4 pages of data keys, there are 3 permanent data keys accessible from on the right side of the panel. These keys are always accessible no matter what the state of the page keys.

Pressing the data keys perform the following functions:

- Source Key – Pressing a source key takes an immediate switch on the panel's current destination.

- Destination Key – Pressing a destination key changes the panel's current destination. The new destination and its current status are displayed in the panel's display. Pressing the lock/protect button or any source key acts on this destination.

- Level Key – The level keys activate or deactivate the level of control associated with the key. (Active levels cause their associated level button to be lit.) One or more level keys can be active at any one time. Activating levels allows the user to take breakaway switches. Pressing a source key causes a switch to be taken on all the active levels. If no level keys are active, than the panel switches all levels that it has access to i.e. a follow mode of operation. .

In addition to the data and page keys, there are two other function keys. These are:

- Lock/Protect key – Pressing the Lock/Protect key for less than 1 second causes the panel's current destination to be "protected". (Only the user who "protected " the destination can switch it.) A Lock/Protect key is lit solid to indicate the destination is protected.

   Pressing the Lock/Protect for approximately 2 seconds puts the current destination into lock. (No one can switch the destination until the lock is cleared.) The Lock/Protect key flashes to indicate the destination is locked.

   If the destination is locked or protected, pressing the lock/protect key for less than 1 second will clear the lock/protect if the panel has sufficient lock priority. (See the 3500Pro manual for complete details on lock priorities.)

- Address Key – The page 4 button is also associated with the panel display address feature. Holding the Page 4/Address button for more than 2 seconds causes the panel display to show the panel's address. Releasing the button causes the display to revert to its standard mode of operation.

GPI's

In addition to the panel's keys, there are 16 GPI's that can be configured to operate the same as the data keys. In fact, the GPI's are configured as data keys in the panel configuration. (They are data keys 132-147.)

For level and destination GPI's, activating the GPI is the same action as pushing a level or destination button on the front panel.

Source GPI's are treated differently depending on whether the panel is configured as a GPI or JS panel.

- GPI panel – Activating a GPI configured as a source causes that source to be taken to the panel's current destination. No change is made when the GPI is deactivated. (The operation is the same as taking a switch from the front panel.)

- JS panel – Activating a GPI on the JS panel also causes the associated source to be switched to the panel's current destination. However, on the release of the GPI, the destination is switched back to the previous source. This allows a GPI to temporarily switch to another source while allowing the destination to recover when the GPI turns off.

Data Key Tally

The panel data keys are lit to indicate the current status of the panel's current destination.

Destination Key Tally
If the destination being controlled by the panel matches the destination assigned to a destination data key, the destination data key's LED will be illuminated.

Source Key Tally (Follow Mode)

LED Illuminated Solid (not blinking)

The current destination's status matches the source assigned to the data key for all levels.

LED Blinking

The current status matches the source assigned to the data key for the default status level. However, there is another level whose status does not match the key's source.

No LED Illuminated

The current status does not match the source assigned to any data key on the default status level.

Source Key Tally (Breakaway Status)

LED Illuminated Solid (not blinking)

The current status matches the source assigned to the data key for all the selected levels

LED Blinking

The current status matches the source assigned to the data key for the highest priority level selected (level 1 is the highest priority level) but does not match for at least one other selected levels.

No LED Illuminated

The current status does not match the source assigned to any data key on the highest priority level selected (level 1 is the highest priority level).

Level Key Tally

When the panel is in a follow mode of operation i.e. it controls all levels to which it is assigned, none of the level keys are lit.

If the panel is in breakaway mode, the keys associated with the currently active breakaway levels are lit.

RCP-GPI/RCP-JS Configuration

The following are the fields that need to be configured in the 3500Pro Configuration Editor. Both panels are configured identically. (The difference between the panels is how source GPI's operate.)

A more complete description of these fields is in the 3500Pro manual.

Panel Name:

Any eight alphanumeric characters. Currently used only by the controller configuration program to provide a user-friendly method of referring to each control panel.

Panel Address:

Decimal number from 1 to 1023 that is used to distinguish each panel on the panel communications bus. Address must match the dip switch setting on the rear of the panel.

Requestor Code:

Decimal number from 1 to 65535 that is used to distinguish the ownership of locks and protects. For example, if two or more panels are assigned the same requestor code and one of the control panels locks or protects a destination the other control panels with the same assigned requestor code and an equal or higher lock priority code may unlock or unprotect the destination.

The assignment of the same requestor code to two or more control panels allows all of the panels with same requestor code assigned to take switches on a protected destination if the destination was protected by one of the panels.

Lock Priority:

Lock priorities are used when a panel attempts to set or clear a destination protect or lock. Only the panel which set a protect or lock or a panel of higher priority can un-protect or unlock a destination once it is locked. Lock priorities range from 0 (master) to 255. The default setting is master.

Status Level:

Level to be statused when the panel is in the Follow Mode.

Status Method:

Indicates the algorithm used to determine panel tally in a follow mode of operation. The **DEF** method uses the status level for all tally determination.

The **GRP** method uses the default status level unless the level is not defined on the panel's current destination. In this case, it searches for a valid level to determine status.

Destination:

The panel's current destination when it comes out of power up or is reset.

Levels of Control List:

List of levels to be controlled by the panel. Any level not assigned in the Levels of Control List will not be accessible or affected by panel operations.

Data Key List:

List containing the assignment of all data keys as configured by the user. The RCP-GPI/RCP-JS Control Panel's 147 data keys can be configured as source, destination, or level keys as follows:

- 1-32 – Page 1 Data keys
- 33-64 – Page 2 Data keys
- 65-96 – Page 3 Data keys
- 97-128 – Page 4 Data keys
- 129-131 – 3 Permanent Data keys
- 132-147 – 16 GPI inputs