

SKIPPER

RELAY EXPANDER

Pulse & State Signal Expander

Installation and Operation Manual

Version 1.0 910926

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1. Introduction

System overview.

The SKIPPER Relay Expander is intended for distribution of galvanically insulated pulse signals in marine instrumentation environments. It is frequently required to connect the output of one instrument to several others, maintaining galvanic separation between the systems. The SKIPPER Pulse Expander has a total of 8 separate relay contact outputs which may be driven 2 by 2 from 4 inputs, 4 by 4 from 2 inputs or all 8 from 1 input. See Fig. 1.0.

The inputs will accept signals from relays, opto-couplers or voltage signals. As long as the input sources are galvanically separated, the unit may of course handle signals from different systems simultaneously. Voltage signals, TTL or CMOS levels, must have a common reference potential (Ground).

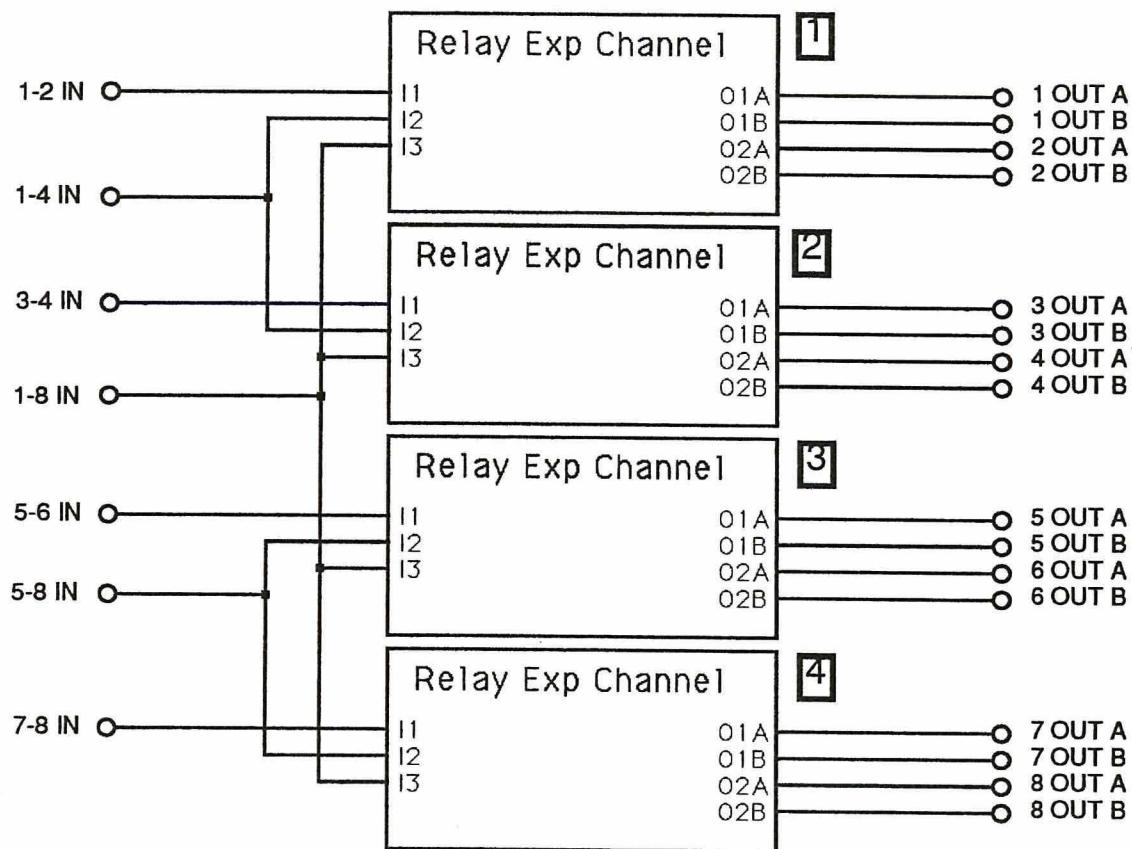


Fig. 1.0 **System Configuration.**

Interfacing.

The SKIPPER Relay Expander has various interface possibilities. The outputs are reed relays, and the inputs are protected voltage sensitive comparator circuits with internal pull-up to 5V. A signal source may be connected without any damage to the Relay Expander as long as:

1. It can withstand a potential of 5V in the "open" state,
2. It can sink a current of 0.5mA from the input pin to Ground in the "closed" state and
3. It does not supply more than $\pm 60V$ in any state.

The voltage threshold is 3V with 100mV hysteresis, and this will accommodate any passive reed relay contact or opto-coupler transistor, as well as various logic family signals and discrete transistor outputs. The basic layout of the input circuitry is shown in Fig. 1.1.

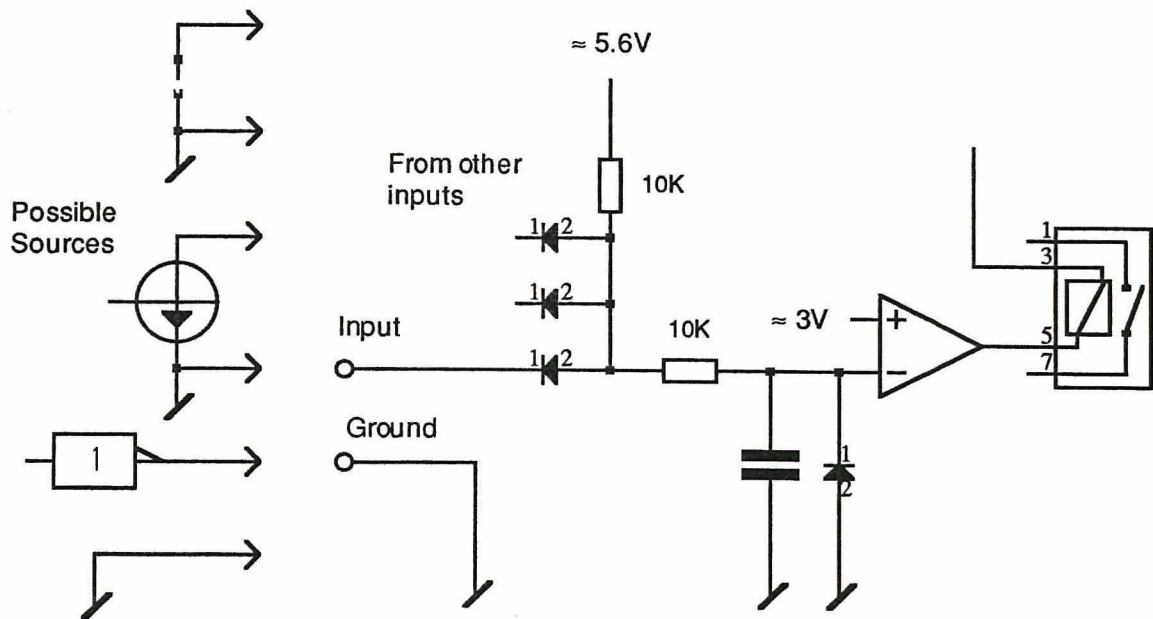


Fig. 1.1 **Input Circuit Principle.**

The input signal is inverted in the sense that a closed relay contact connected between an input and ground, causes the corresponding output relays to be de-energized, and their contacts to be open. Note that this inverting property may be useful if the source and the receiver have opposite level definitions of a state signal. If the signal state is significant, and it is not possible to invert the state neither in the the signal source nor in the receiver, the signal may be inverted in the Relay Expander by running it through 2 circuits in series. Signal inversion does not matter if the contact carry pulse time information.

2. Installation

The Relay Expander is mounted in a plastic box equipped with 9 cable glands.

For optimum operation reliability, fit the unit in a location where it is protected from excessive heat and exposure to water or oil spray.

Fig. 2.1 shows the dimensions and the cable gland layout.

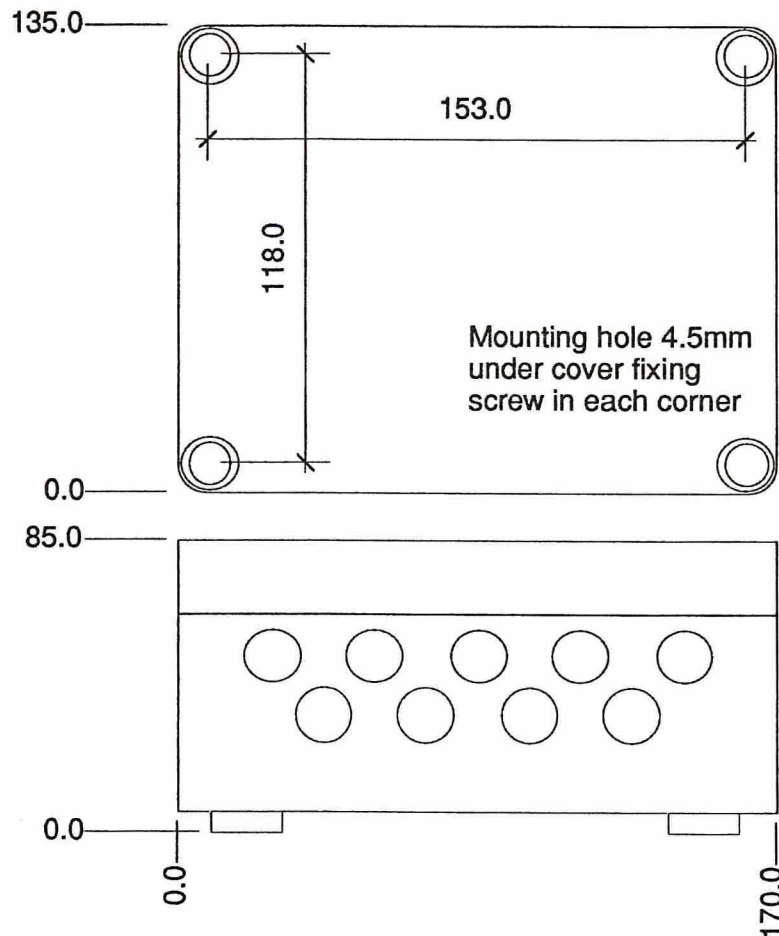


Fig. 2.1 Relay Expander Box, Dimensions.

Do not perform installation work with system power applied!!

Power supply may be either 220V/110V AC or 24V DC. Power consumption is appx. 2,5 W at 24V, appx. 4W at 220V.

If the AC power system is 110V, the Relay Expander may be prepared for 110V AC by re-connecting the jumpers JP 1, JP2 as shown in Fig. 2.2.

Signal sources are connected between the appropriate input terminal and any of the ground terminals. The output terminals are directly connected to the relay contacts. If it is necessary to invert a signal by looping it back through another channel, it will be necessary to connect one relay terminal to ground, the other to the appropriate input.

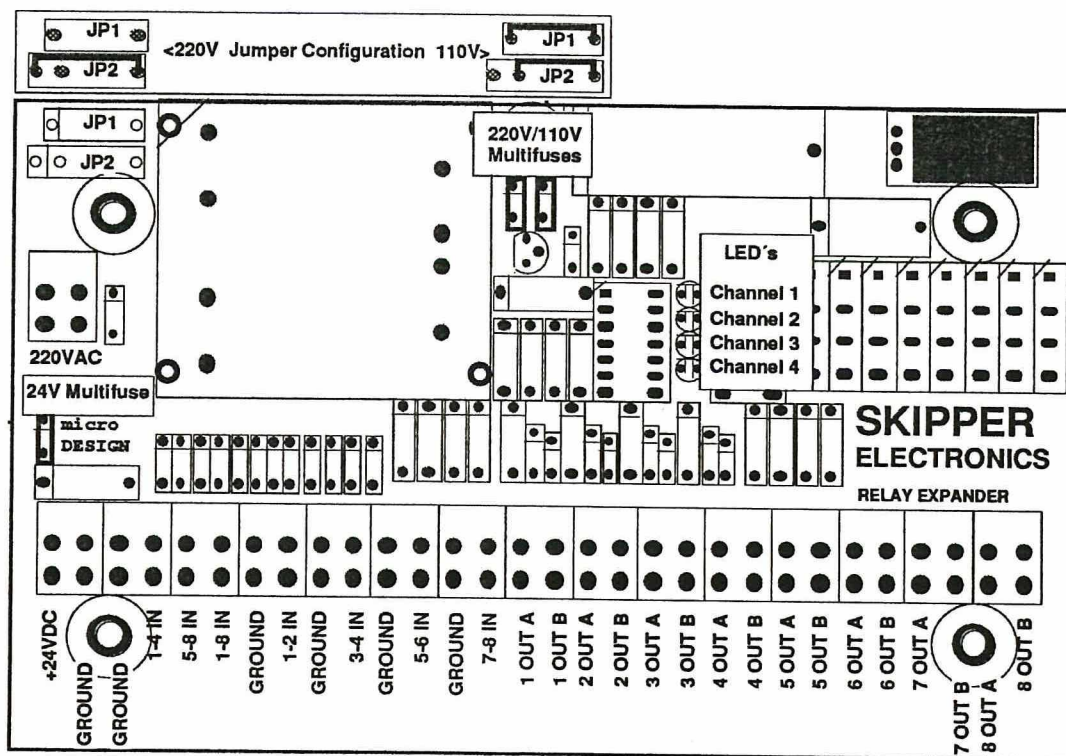


Fig. 2.2 AC power Jumpers, Location of Fuses and LED's .

The circuit board is equipped with four LED lamps indicating the state of the relay channels. The board is equipped with Multifuse™ electronic fuses and replacement of these should not be necessary. Any malfunctioning unit should be submitted to an approved SKIPPER service representative. Fig. 2.2 shows the location of the LED lamps and fuses.

3. Operation

The indication LED of a channel will glow faintly when the two relays of that channel are energized, i.e. **all of** the inputs controlling that channel are "high" or "open". It will glow brightly if the relays are de-energized, i.e. **one of** the inputs controlling the channel is "low" or "closed".

4. User Maintenance

The unit contains no user serviceable parts, and requires no maintenance.

5. Specifications

Dimensions

Height, front	135 mm
Width	170 mm
Depth	85 mm

Performance and Environmental

Supply voltage:	220V or 110VAC, 24VDC (16-36V)
Supply voltage:	2.5W at 24V, 4W at 220V
Relay Output Contact:	Reed contact, max 10V, 10 mA
Channel Input:	Internal pull-up to 5V. Source must sink 0.5 mA to Ground. Input withstand $\pm 60V$ without damage.
Maximum Recommended Operation Frequency:	5Hz.
Operating temperature:	0-55 °C
Storage temperature:	-20 - +70 °C
Humidity:	10-96 % relative, no condensation.

7. Service

All service requests should be made to the local SKIPPER representative.