

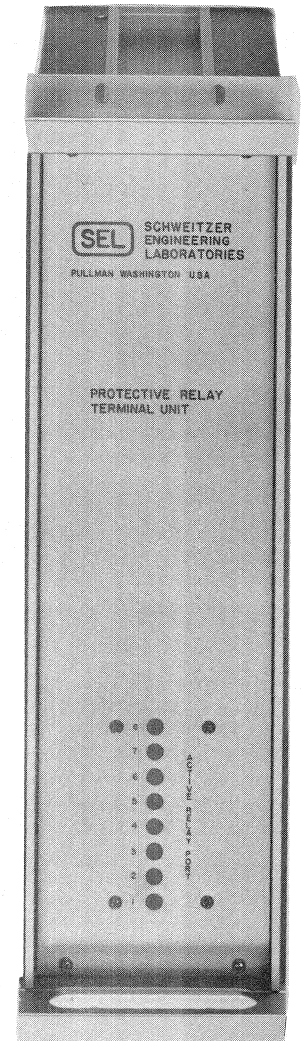
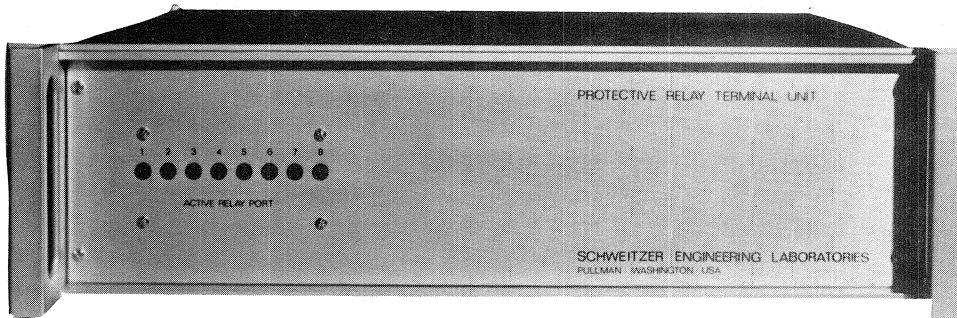


SCHWEITZER ENGINEERING LABORATORIES, INC.  
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## SEL-PRTU

# PROTECTIVE RELAY TERMINAL UNIT

## DATA SHEET



- \* CONTROL AND MONITOR UP TO EIGHT DIGITAL RELAYS OR OTHER RS-232-C DEVICES
- \* ACCESS THE EIGHT DEVICES THROUGH A MODEM AND THROUGH A LOCAL TERMINAL
- \* PRINTS ALL TRANSMISSIONS FROM RELAYS ON THE LOCAL TERMINAL
- \* SAVES AUTOMATIC TRANSMISSIONS FROM RELAYS, AND HOLDS MESSAGES UNTIL THEY ARE REQUESTED THROUGH MODEM PORT
- \* TIME CLOCK MAY BE SYNCHRONIZED BY IRIG-B TIME-CODE SIGNAL
- \* SURGE-PROTECTED DATA PORTS WITHSTAND HARSH SUBSTATION ENVIRONMENT
- \* OPERATES FROM STATION BATTERY OR FROM STATION-SERVICE AC
- \* SELF TESTS CHECK RAM, ROM, AND SETTINGS. ALARMS ARE INDICATED BY CONTACT CLOSURE AND BY MESSAGE. SELF TEST INCLUDES STALL TIMER

## DESCRIPTION

The PRTU provides substation communications between up to eight SEL digital relays, a local port, and a modem port.

The PRTU scans the eight relay ports by selecting one port at a time, and waiting a settable dwell time for data. If a relay has data, such as an automatically-generated fault report, then the PRTU accepts the data. The PRTU sends the message to its local port, for printing or display on a local terminal. The PRTU also saves the message, so that it is accessible remotely through the modem port. Once the message is transferred from the relay to the PRTU, the PRTU resumes its scan with the next relay port.

With the help of the PORT command, you may tell the PRTU to stop its scanning process, and stay connected to the port you designate. The PRTU is then transparent, allowing direct communications between either the modem or local port and the selected relay port. This feature permits you to set the selected relay, request event reports, or execute control functions. At the end of a settable timeout interval, the PRTU resumes scanning the eight ports.

Eight light-emitting diodes on the front panel indicate the active port.

## HOW IT WORKS

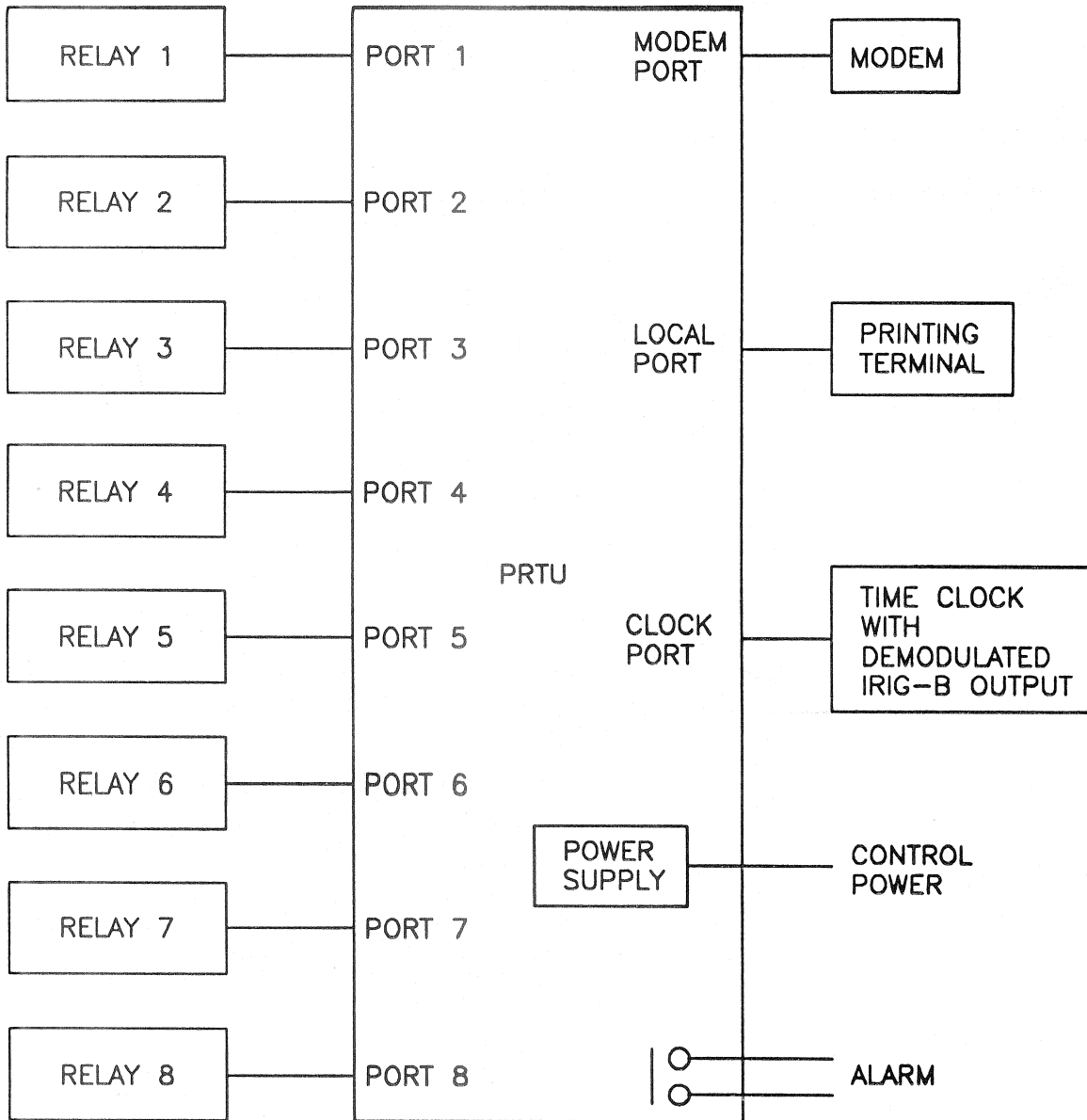
Almost all devices communicating via the RS-232-C interface include means to stop and start their data transmissions. The two most common means of "handshaking" are by hardware control line or lines, and by special handshake characters. The handshake characters usually used are the ASCII XON and XOFF symbols. The SEL series of digital protective relays uses the XON/XOFF method to control data flow.

The PRTU allows one relay at a time to transmit its data to the PRTU. It does this by telling all devices, except one, not to transmit data. The PRTU accomplishes this by sending an XOFF to all ports, then sending an XON to the active port. The relays receiving XOFF cannot transmit data to the PRTU. The one relay receiving XON can transmit data. If an event has occurred, then the relay will use this XON opportunity to transmit its data to the PRTU. The PRTU keeps the relay in the XON state as long as the relay continues to transmit data. When the relay is quiet for a settable time period, the PRTU sends XOFF to it. The PRTU then transmits an XON to the next port, and waits the time period to see if a message is pending. The process continues to scan all of the ports where relays are connected. The scanning process skips over unused ports.

The PRTU must determine when a message from a relay is complete. Each message transmitted by the relays ends with the "ETX" (end of text) symbol. The PRTU knows a message is complete when this character is detected.

## SPECIFICATIONS

Serial Ports	Eight relay ports One modem port One local terminal port Ports are EMI protected
Data Communications	RS-232-C
Port Configuration	Eight data bits, two stop bits, no parity. Other configurations available upon request.
Baud Rates	300, 1200, 2400, 9600. Jumper selectable. Unique rates may be chosen for the modem and local ports. One rate applies to the eight relay ports.
Port Connections	Transmit data output (TXD) Receive data input (RXD) Request to send output (RTS) Clear to send input (CTS) Ground +5, +12, -12 volts outputs
Port Buffers	2200 bytes/ port--accommodate 10 messages/port
Clock Port	Demodulated IRIG-B time code input provides means to synchronize the internal time-of-day clock. Input is optically isolated.
Alarm Output	Alarm contacts are held open by stall timer. Power supply failure, processor stall, or self-test failure closes the alarm output contacts.
Power Supply	48 Volt: 20 - 60 VDC; 12 watts 125 Volt: 85 - 200 VAC or VDC; 12 watts 250 Volt: 85 - 280 VDC or 85 - 200 VAC; 12 watts
Auxiliary Power	5 volts: up to +1000 mA +12 volts: up to 100 mA -12 volts: up to 100 mA These are available for powering an external modem, or other communications equipment. Greater ampacity is available upon request.
Temperature Range	-20 to +55 degrees Celsius
Electrical Withstand	Power supply and alarm contacts are SWC tested. Port data and control lines are EMI protected by low-voltage MOVs and passive filters.
Dimensions	19" wide by 13" deep by 5-1/4 inches high. Mounts in 19-inch relay rack.
Weight	11 pounds

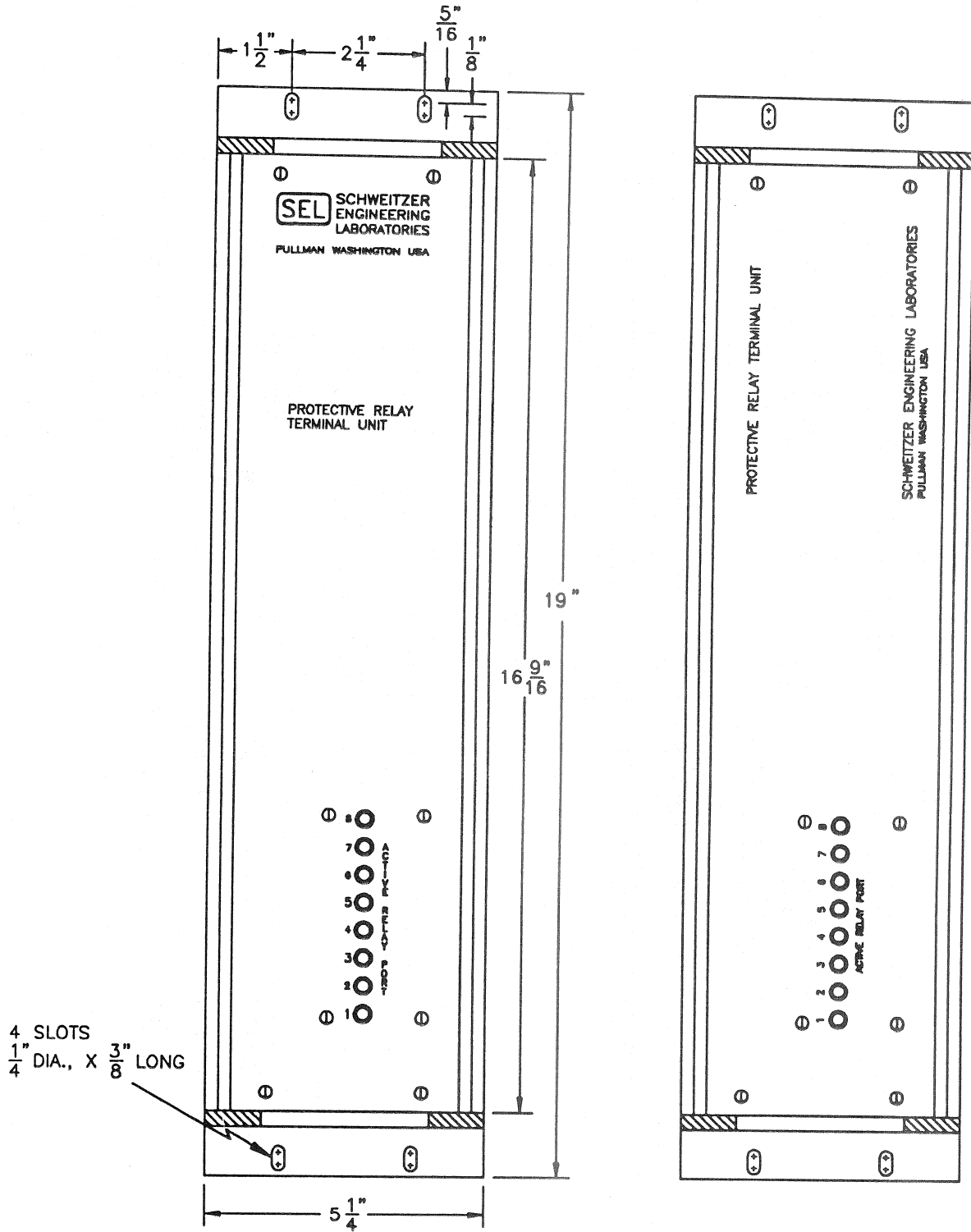


PRTU TYPICAL EXTERNAL CONNECTION DIAGRAM

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DWG. NO. A7-0467  
DATE: 12-16-88

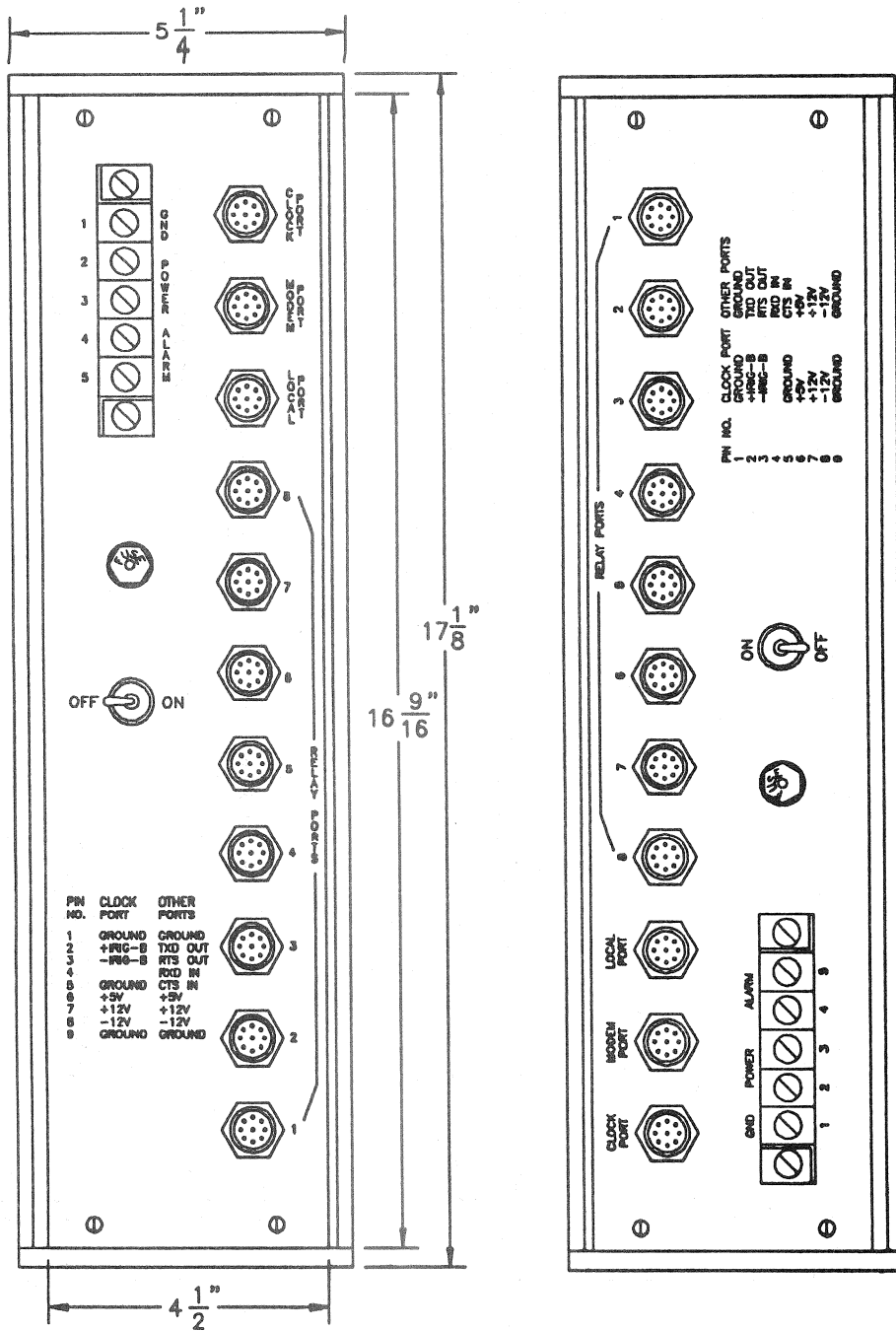


PROTECTIVE RELAY TERMINAL UNIT VERTICAL AND HORIZONTAL FRONT PANEL DRAWINGS

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DWG. NO. A7-0468  
 DATE: 12-16-88



## PROTECTIVE RELAY TERMINAL UNIT VERTICAL AND HORIZONTAL REAR PANEL DRAWINGS

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DWG. NO. A7-0469  
DATE: 12-16-88

## SEL PROTECTIVE RELAY TERMINAL UNIT COMMAND SUMMARY

### Level 0

ACCESS Answer password prompt (if password protection enabled) to gain access to Level 1. Three unsuccessful attempts pulses ALARM relay.

### Level 1

2ACCESS Answer password prompt (if password protection enabled) to gain access to Level 2. This command always pulses the ALARM relay.  
DATE Show or set date. DATE 2/3/88 sets date to February 3, 1988.  
CLEAR Clear events from either port. CLEAR 1 clears events in relay Port 1 buffer.  
EVENT Show event record from modem port only. EVENT shows all events. EVENT 5 shows Port 5 events.  
PORT Communicate with one relay port from local or modem port. Port 3 connects to relay Port 3.  
QUIT Return to Access Level 0.  
SHOWSET Show settings - does not affect settings.  
STATUS Show status of self-tests.  
TIME Show or set time. TIME 13/32/00 sets time to 1:32:00 PM.

### Level 2

INTERVAL Show or set command timeout interval.  
MODEM Show or set number of rings before modem at host port answers.  
PASSWORD Show or set passwords.  
    PASSWORD 1 OTTER sets level 1 password to OTTER.  
    PASSWORD 2 TAIL sets level 2 password to TAIL.  
SET Initiate settings procedure. ALARM relay closes when new settings are enabled.

