

# Reclosers

**Form 5 Standard/LS/UDP Controls  
Fiber-Optic/RS-232 Serial Communications  
Accessory Operation Instructions**

**Service Information**  
**S280-79-3**

**Form 5 Standard Control: Applicable to Serial Numbers 2999 and below**



**Figure 1.**  
Fiber-Optic/RS-232 serial communications accessory circuit board side and front view.

970035KM  
970036KM

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## SAFETY FOR LIFE



Cooper Power Systems products meet or exceed all applicable industry standards relating to product safety. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Cooper Power Systems employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally approved safety procedures and safety instructions when working around high voltage lines and equipment and support our “Safety For Life” mission.

## SAFETY INFORMATION

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

*A competent technician has these qualifications:*

- *Is thoroughly familiar with these instructions.*
- *Is trained in industry-accepted high- and low-voltage safe operating practices and procedures.*
- *Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.*
- *Is trained in the care and use of protective equipment such as flash clothing, safety glasses, face shield, hard hat, rubber gloves, hotstick, etc.*

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

### Safety Instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.



**DANGER:** Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high and low voltage lines and equipment.

G103.3



**WARNING:** Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling or maintenance can result in death, severe personal injury, and equipment damage.

G101.0



**WARNING:** This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury, and equipment damage.

G102.1



**WARNING:** Power distribution equipment must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install, or maintain power distribution equipment can result in death, severe personal injury, and equipment damage.

G122.2

### Hazard Statement Definitions

This manual may contain four types of hazard statements:



**DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

# PRODUCT INFORMATION

**TABLE 1**  
**Ordering Information**

Single Fiber-Optic/RS-232 Serial Communications Accessory with DB-25 Connector Includes: circuit board, all power cables, and hardware. (Does not include Fiber-Optic to RS-232 converter KME4-163.)	KME5-65-1
Dual Fiber-Optic/RS-232 Serial Communications Accessory with DB-25 Connector Includes: circuit boards, all power cables, and hardware. (Does not include Fiber-Optic to RS-232 converter KME4-163.)	KME5-65-2
Single Fiber-Optic/RS-232 Serial Communications Accessory with DB-9 Connector Includes: circuit board, all power cables, and hardware. (Does not include Fiber-Optic to RS-232 converter KME4-163.)	KME5-65-3
Dual Fiber-Optic/RS-232 Serial Communications Accessory with DB-9 Connector Includes: circuit boards, all power cables, and hardware. (Does not include Fiber-Optic to RS-232 converter KME4-163.)	KME5-65-4

## Introduction

*Service Information S280-79-3* provides operation instructions for the Kyle Form 5 Fiber-Optic and RS-232 accessories. These accessories provide a permanent communications link to the Form 5 control.

These accessories can be used on the following Form 5 recloser controls:

- Form 5, Standard (Serial Numbers below 3000)
- Form 5 LS/UDP

For installation and operation of the Form 5 recloser control, refer to the following manuals:

- *Service Information S280-79-1, Form 5 Standard Controls Installation and Operation Instructions (applicable to Serial Numbers 2999 and below)*
- *Service Information S280-79-12, Form 5 LS/UDP Controls Installation and Operation Instructions*

## Read This Manual First

Read and understand the contents of this manual and follow all locally approved procedures and safety practices before installing or operating this equipment.

## Additional Information

These instructions cannot cover all details or variations in the equipment, procedures, or process described nor provide directions for meeting every possible contingency during installation, operation, or maintenance. When additional information is desired to satisfy a problem not covered sufficiently for the user's purpose, please contact your Cooper Power Systems representative.

## Acceptance and Initial Inspection

Each accessory is tested and inspected at the factory. It is in good condition when accepted by the freight carrier for shipment.

Upon receipt, inspect the accessory thoroughly for damage incurred during shipment. If damage is discovered, file a claim with the carrier immediately.

## Handling and Storage

**CAUTION:** Equipment Damage. Always wear a grounding wrist strap to control static electricity before handling circuit boards. Failure to use this strap may result in circuit board damage. T253.1

If the fiber-optic/RS-232 accessory boards are to be stored for a period of time, provide a clean, dry storage area. Handle carefully to avoid damage to the circuit boards.

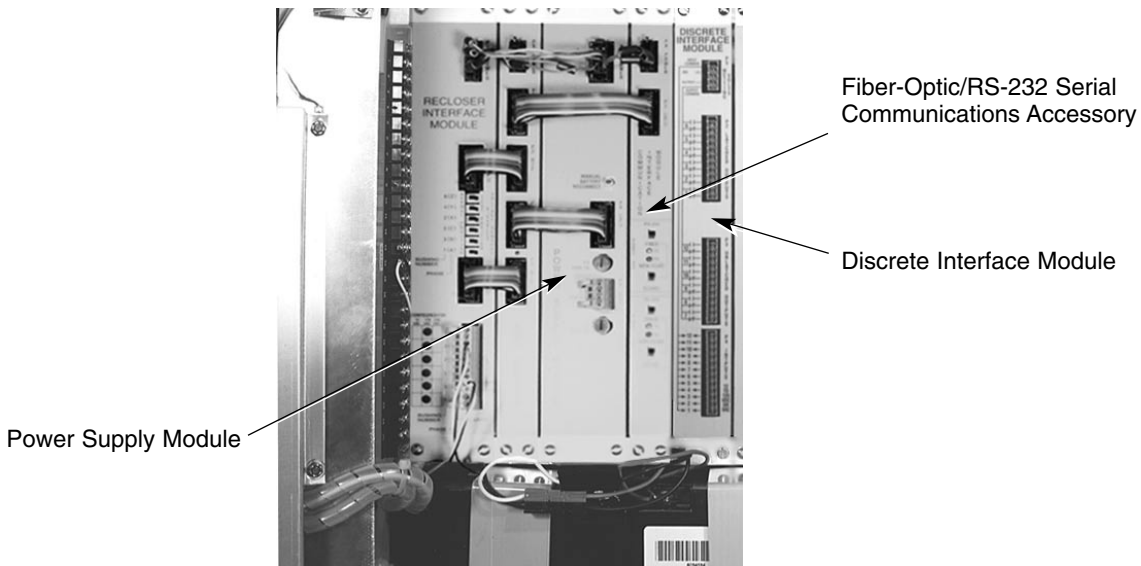
**IMPORTANT:** The fiber-optic and RS-232 circuit boards should each be stored in a static-proof bag.

## Quality Standards

The Quality System at the Cooper Power Systems, Kyle Distribution Switchgear plant is certified to the ISO 9001 standard.

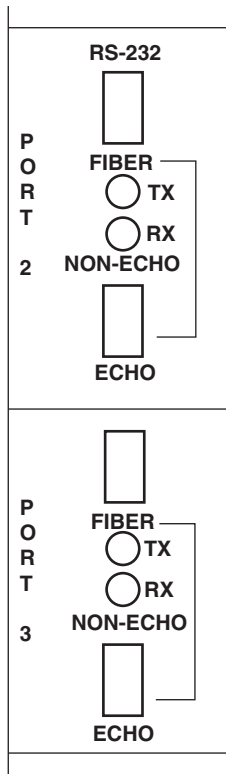
## Product Description

The Fiber-Optic/RS-232 Interface Accessory gives the Form 5 both a Fiber-Optic and an RS-232 physical interface on one board. The board is located on the Communications Interface Module (CIF) frame under the Local User Interface board (LUIF) (Figure 2). The Form 5 has two external Serial Interface Ports which connect to the LUIF. A front panel on the CIF will allow the customer to select which port connects to a particular interface (Figure 3). When two Fiber-Optic or two RS-232 interfaces are required, there is a provision for a second installed board. The boards will automatically configure themselves, so the front panel operation remains substantially the same.



**Figure 2.**  
Location of Fiber-Optic/RS-232 Serial Communications Accessory on the Form 5 back panel.

## OPERATION



**Figure 3.**  
Fiber-optic panel front view of Port 2 and Port 3.

**CAUTION:** Control damage. De-energize both ac and dc power prior to removing or installing any internal connections or circuit boards in the control. Failure to comply can result in damage to the control. T241.1

**CAUTION:** Equipment Damage. Always wear a grounding wrist strap to control static electricity before handling circuit boards. Failure to use this strap may result in circuit board damage. T253.1

The front panel of the CIF contains a series of four switches and four LEDs divided into two groups. The top group is the set for Port 2, the bottom is the set for Port 3. Each group has an interface selection switch, echo/non-echo switch, and transmit/receive LEDs.

When there is one board in the system, it supports both communication ports, with the user selecting a primary interface (Fiber-Optic or RS-232) for the desired ports. The Port 3 selection switch is the primary interface selection. The interface for Port 2 is the opposite of that selected for Port 3, independent of the position of the selector switch. For clarity, the Port 2 selection switch should be set *opposite* of the Port 3 selection switch. The echo switch is enabled for the port using the fiber interface. Refer to Table 2.

When only one port is utilized, Port 3 is preferred, since it is un-interruptable. Port 2 will cease communications when the front panel port is connected.

With two boards in the system, either port can be configured for either interface. The Port 2 switches control the front board, and the Port 3 switches control the back board. The selection table for the front panel with two boards in the system is as shown in Table 3.

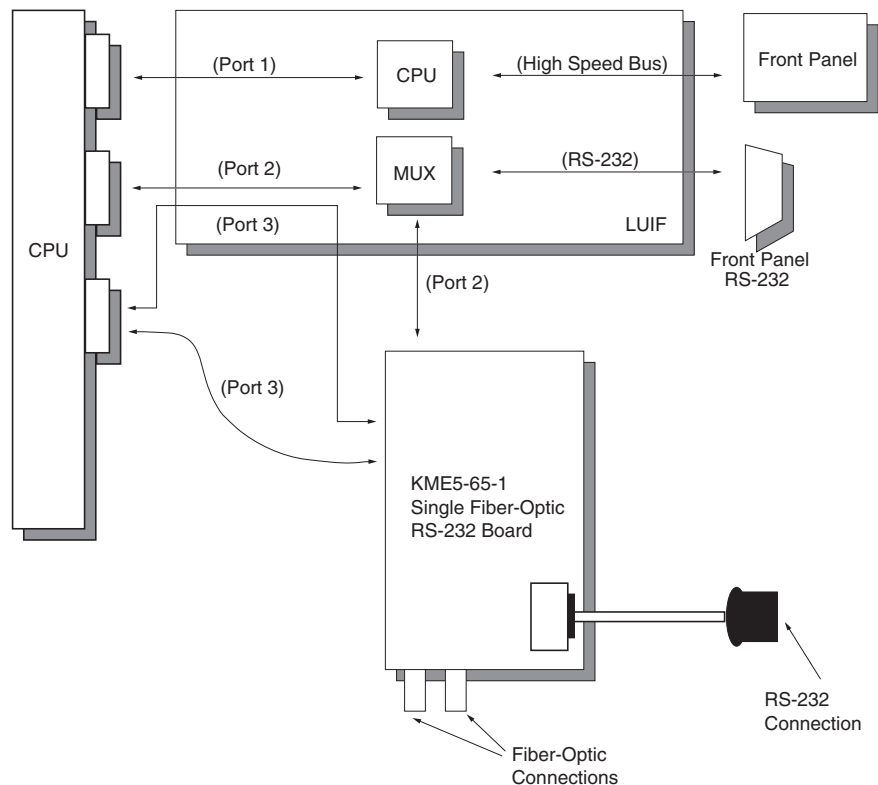
**TABLE 2**  
**Port Configuration for Single Fiber-Optic/RS-232 Serial Communications Accessory**

Port 2 Selection Switch	Port 3 Selection Switch	Port 2 Echo Switch	Port 3 Echo Switch	Port 2 is routed to . . .	Port 3 is routed to . . .
X	Fiber	X	enabled	RS-232 or EIA-232D	Fiber
X	RS-232	enabled	X	Fiber	RS-232

**TABLE 3**  
**Port Configuration for Dual Fiber-Optic/RS-232 Serial Communications Accessory**

Port 2 Switch	Port 3 Switch	Port 2 Echo Switch	Port 3 Echo Switch	Port 2 is routed to . . .	Port 3 is routed to . . .
Fiber	Fiber	Enabled	Enabled	Front Fiber	Back Fiber
Fiber	RS-232	Enabled	X	Front Fiber	Back RS-232
RS-232	Fiber	X	Enabled	Front RS-232	Back Fiber
RS-232	RS-232	X	X	Front RS-232	Back RS-232

The Fiber-Optic/RS-232 Interface transmits input and output data to and from the Form 5 recloser control to external remote communications devices. Remote communication is possible with a remote terminal unit (RTU), personal computer, or modem equipped device. Customer supplied Fiber-Optic cabling or direct RS-232 connection provides the data transmission media. The RTU, personal computer, or modem-equipped drive must be equipped with standard ST-type connectors to transmit and receive data when using the Fiber-Optic Interface Connection (Figure 4).

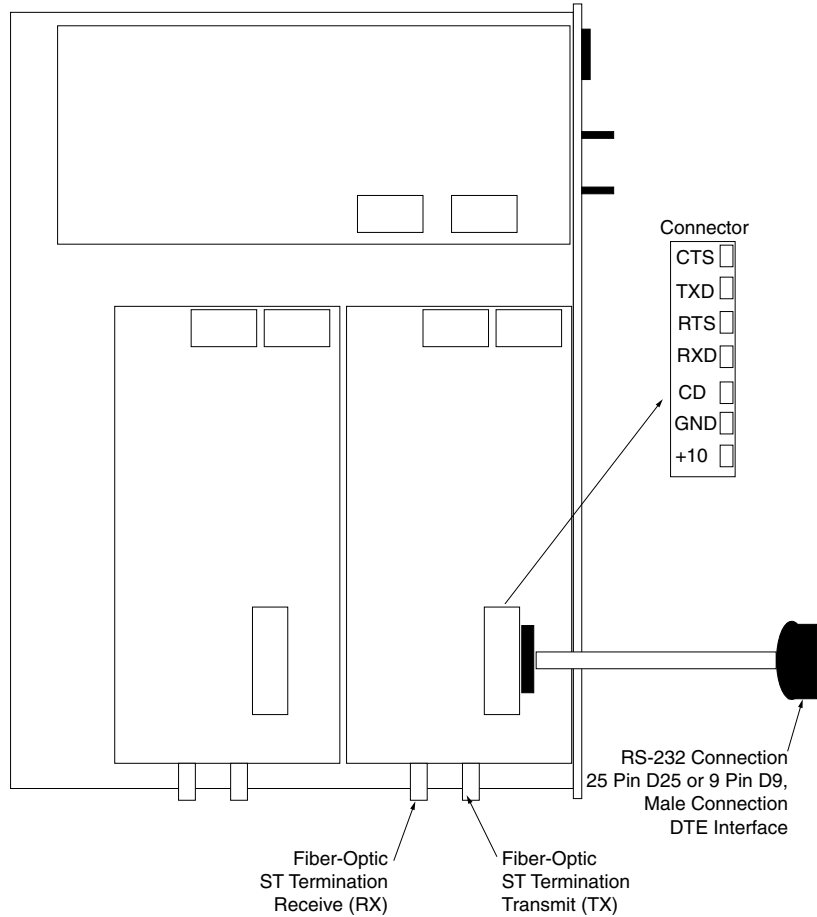


**Figure 4.**  
**CPU, LUIF, and KME5-65-1 Connection Diagram.**

If the RS-232 connection is used to connect to a personal computer (PC), a null modem is required because the RS-232 connection is wired as Data Terminal Equipment (DTE).


**CAUTION:** Control damage. De-energize both ac and dc power prior to removing or installing any internal connections or circuit boards in the control. Failure to comply can result in damage to the control. T241.1

Connections to the Fiber-Optic ST Terminals (Figure 5) are accomplished by removing the batteries located in the bottom of the control cabinet.



**Figure 5.**  
**Fiber-Optic / RS-232 Connection Locations.**

## SERVICE INFORMATION

 **WARNING:** This equipment requires routine inspection and maintenance to ensure proper operation. If it is not maintained it can fail to operate properly. Improper operation can cause equipment damage and possible personal injury.

G105.1

### Replacement Kits

Replacement kits for the Kyle Form 5 Control are available through the factory Service Department. To order these kits, refer to the Replacement Parts price list for catalog numbers and pricing. Contact your Cooper Power Systems representative for additional information and ordering procedures.

### Factory-Authorized Service Centers

Factory-authorized service centers are located throughout the continental United States to provide maintenance, repair, and testing services for Kyle controls and reclosers. For further information, contact your Cooper Power Systems representative.

### Factory Maintenance Classes

The factory service department offers a basic testing and troubleshooting course for the Form 5 Microprocessor-Based Electronic Recloser Control and Reclosers. This course, taught by experienced service technicians, is held at the factory in-house training facility. For additional information, contact your Cooper Power Systems representative.



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