410–00 Transfer Relay Module

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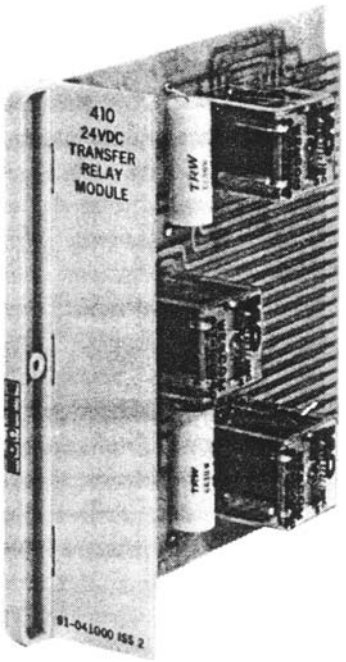


Figure 1. 410 Transfer Relay Module

1. GENERAL

1.1 Document Purpose

This document provides circuit description, installation procedures and basic testing for the 410-00 Transfer Relay module (Figure 1).

1.2 Document Status

This is a first printing document.

1.3 Equipment Function

The 410-00 Transfer Relay is a plug-in printed circuit board module which provides three independently-operated relays. These relays may be used in a variety of applications, as explained in *Application Guidelines*.

1.4 Equipment Location/Mounting

The 410 is designed to mount in one position of a 400 mounting assembly. The 400 mounting assemblies are available to accommodate from 1 to 13 modules and allow for either key telephone unit (KTU) apparatus case or relay-rack mounting.

2. INSPECTION

2.1 Inspect for Damages

Inspect the equipment thoroughly upon delivery. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company.

2.2 Equipment Identification

Charles Industries' equipment is identified by a model and issue number imprinted on the front panel or located elsewhere on the equipment. Each time a major engineering design change is made on the equipment, the issue number is advanced by 1 and imprinted on subsequent units manufactured. Therefore, be sure to include both the model number and its issue number when making inquiries about the equipment.

3. APPLICATION GUIDELINES

The relays of the 410 can be used in a variety of applications, including:

- Loudspeaker cut-off
- Data transfer
- Loopback

Generally, the 410 can be used any time a relay contact is required.

The use of the 410 depends on the application. For instance, if connecting a circuit to a system after disconnecting a different circuit from the system was required, a transfer (form C) relay contact would be required. To connect one circuit to another, a form A relay contact is required.

4. CIRCUIT DESCRIPTION

Each 410 provides three completely independent relays. Each relay can be energized by applying 24 Vdc to the relay coil. The best circuit design provides −24V battery on the coil at all times with ground as the switched potential. The relay can be composed of form A or form C relay contacts. Each relay contains six sets of relay contacts.

Each relay coil in the 410-00 is bypassed by a nonpolarized, mylar capacitor. The capacitor provides transcient suppression and permits each relay to be operated from a DC supply, regardless of polarity.

Relays A and B provide five sets of form C contacts and one set of form A contacts. Relay C is composed of four sets of Form C contacts and two sets of Form A contacts.

Table 1. 410 Relay Contact Forms

410 Version	Relay A Type and Number	Relay B Type and Number	Relay C Type and Number
410-00*	5 Form C 1 Form D	5 Form C 1 Form A	4 Form C 2 Form A
* Coil (winding) in parallel with a 0.68uF, 100 volt capacitor.			

5. MOUNTING

The 410 is a plug-in module designed to mount in one module position of a Type 400 mounting assembly. Refer to the mounting assembly document for details.

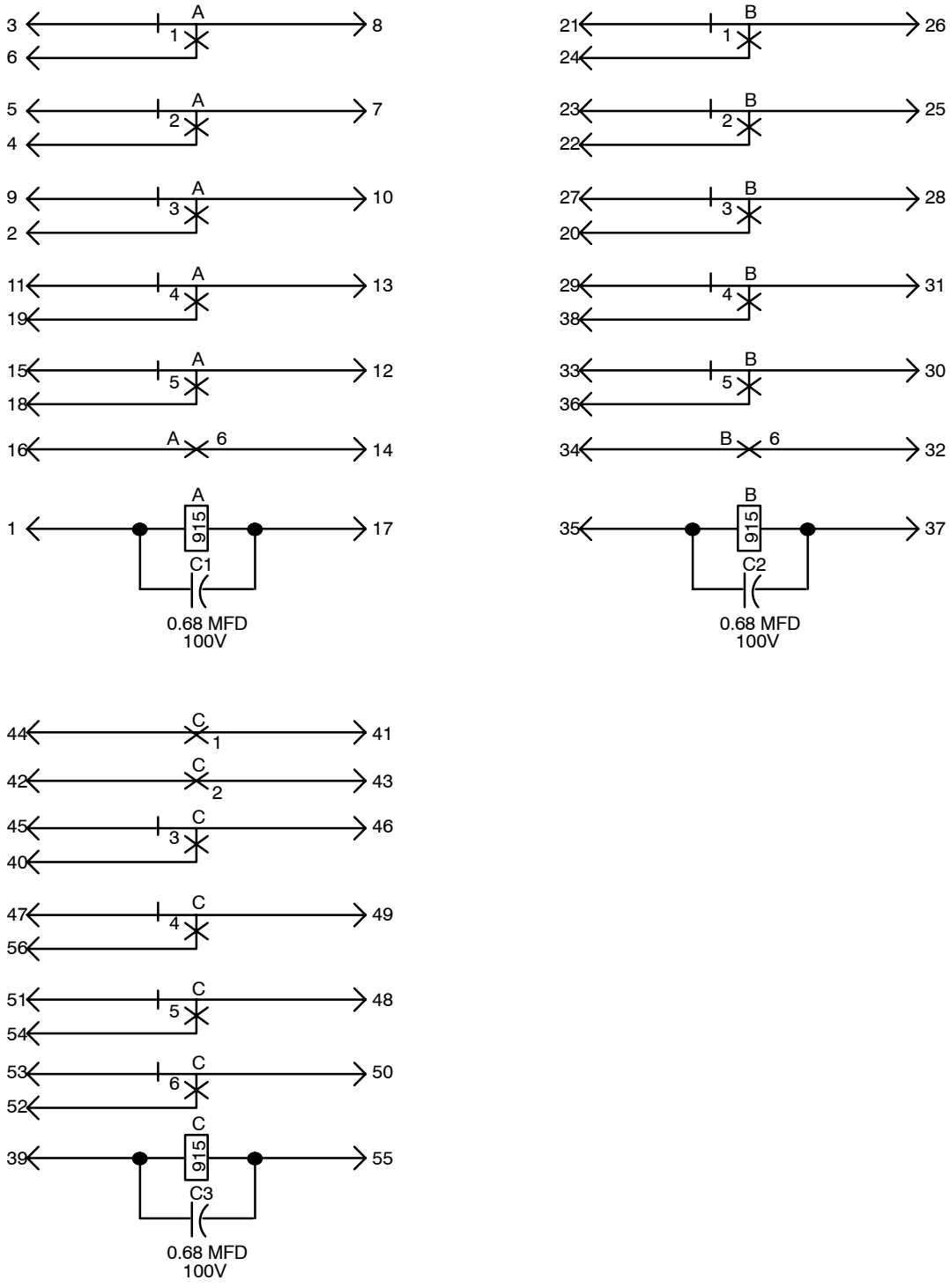
6. INSTALLER CONNECTIONS

The 410 makes electrical connection to the associated equipment through a 56-pin, wire-wrapped, card-edge connector provided as part of the mounting assembly. Make all installer connections to the mounting assembly card connector in accordance with Table 2 and Figure 2.

Table 2. 410 Installer Connections

Connect	To 56-Pin Connector
RELAY A	
Contact set 1, normally closed (break)	8 to 3
Contact set 1, normally open (make)	8 to 6
Contact set 2, normally closed (break)	7 to 5
Contact set 2, normally open (make)	7 to 4
Contact set 3, normally closed (break)	10 to 9
Contact set 3, normally open (make)	10 to 2
Contact set 4, normally closed (break)	13 to 11
Contact set 4, normally open (make)	13 to 19
Contact set 5, normally closed (break)	12 to 15
Contact set 5, normally open (make)	12 to 18
Contact set 6, normally open (make)	14 to 16
Relay coil	1 and 17

Connect	To 56-Pin Connector
RELAY B	
Contact set 1, normally closed (break)	26 to 21
Contact set 1, normally open (make)	26 to 24
Contact set 2, normally closed (break)	25 to 23
Contact set 2, normally open (make)	25 to 22
Contact set 3, normally closed (break)	28 to 27
Contact set 3, normally open (make)	28 to 20
Contact set 4, normally closed (break)	31 to 29
Contact set 4, normally open (make)	31 to 38
Contact set 5, normally closed (break)	30 to 33
Contact set 5, normally open (make)	30 to 36
Contact set 6, normally open (make)	32 to 34
Relay coil	35 and 37
RELAY C	
Contact set 1, normally open (make)	41 to 44
Contact set 2, normally open (make)	43 to 42
Contact set 3, normally closed (break)	46 to 45
Contact set 3, normally open (make)	46 to 40
Contact set 4, normally closed (break)	49 to 47
Contact set 4, normally open (make)	49 to 56
Contact set 5, normally closed (break)	48 to 51
Contact set 5, normally open (make)	48 to 54
Contact set 6, normally closed (break)	50 to 53
Contact set 6, normally open (make)	50 to 52
Relay coil	39 and 55



Note: ← *PC Board Connector*

⊣ ⊢ *NO, NC Relay Contacts*

Figure 2. 410-00 Transfer Relay Module Schematic Diagram

7. TESTING

If trouble is encountered with the operation of the 410, verify that all installer connections have been properly made in accordance with Table 2, and the module is making good connection with the mounting assembly connector. Remove and reinsert the module. If the trouble persists, perform the test procedure below to determine whether the fault is internal or external to the 410.

The following equipment is required to test the 410:

- Multimeter: Simpson 260 or equivalent
- Charles Industries 415 card extender

Step	Action	Verification
1.	Remove the 410 from its mounting position and insert the 415 card extender in its place. Insert the 410 into the 415.	
2.	Set the multimeter for resistance measurement. Place one lead of the multimeter on pin 14 of the 415 and the other lead on pin 16.	The multimeter should read infinite ohms, indicating that relay A is not energized.
3.	Energize relay A.	The multimeter should read zero ohms, indicating that relay A has operated.
4.	De-energize relay A.	The multimeter should read infinite ohms, indicating that relay A has been released.
5.	Transfer the multimeter connections to pins 32 and 34 of the 415 card extender.	The multimeter should read infinite ohms, indicating that relay B is not energized.
6.	Energize relay B.	The multimeter should read zero ohms, indicating that relay B has operated.
7.	De-energize relay B.	The multimeter should read infinite ohms, indicating that relay B has been released.
8.	Transfer the multimeter connections to pins 41 and 44 of the 415 card extender.	The multimeter should read infinite ohms, indicating that relay C is not energized.
9.	Energize relay C.	The multimeter should read zero ohms, indicating that relay C has operated.
10.	De-energize relay C.	The multimeter should read infinite ohms, indicating that relay C has been released.
11.	Remove all test connections and restore all equipment to normal operation.	

8. TECHNICAL ASSISTANCE

If technical assistance is required, contact Charles Industries' Technical Services Center at:

847−806−8500
847−806−8556 (FAX)
800−607−8500
techserv@charlesindustries.com (e-mail)

9. WARRANTY & CUSTOMER SERVICE

9.1 Warranty

Charles Industries, Ltd. offers an industry-leading, 5-year warranty on products manufactured by Charles Industries. Contact your local Sales Representative at the address or telephone numbers below for warranty details.

The warranty provisions are subject to change without notice. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract.

Charles Industries, Ltd.
5600 Apollo Drive
Rolling Meadows, Illinois 60008–4049
847–806–6300 (Main Office)
847–806–6231 (FAX)

9.2 Field Repairs (In-Warranty Units)

Field repairs involving the replacement of components within a unit are not recommended and may void the warranty and compatibility with any applicable regulatory or agency requirements. If a unit needs repair, contact Charles Industries, Ltd. for replacement or repair instructions, or follow the *Repair Service Procedure* below.

9.3 Advanced Replacement Service (In-Warranty Units)

Charles Industries, Ltd. offers an “advanced replacement” service if a replacement unit is required as soon as possible. With this service, the unit will be shipped in the fastest manner consistent with the urgency of the situation. In most cases, there are no charges for in-warranty repairs, except for the transportation charges of the unit and for a testing and handling charge for units returned with no trouble found. Upon receipt of the advanced replacement unit, return the out-of-service unit in the carton in which the replacement was shipped, using the preaddressed shipping label provided. Call your customer service representative at the telephone number above for more details.

9.4 Standard Repair and Replacement Service (Both In-Warranty and Out-Of-Warranty Units)

Charles Industries, Ltd. offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles Industries for either repair and quality testing or exchanged for a replacement unit, as determined by Charles Industries. Follow the *Repair Service Procedure* below to return units and to secure a repair or replacement. A handling charge applies for equipment returned with no trouble found. To obtain more details of this service and a schedule of prices, contact the CI Service Center at 217–932–5288 (FAX 217–932–2943).

Repair Service Procedure

1. Prepare, complete, and enclose a purchase order in the box with the equipment to be returned.

2. Include the following information:

   – Company name and address
   – Contact name and phone number
   – Inventory of equipment being shipped
   – Particulars as to the nature of the failure
   – Return shipping address

3. Ship the equipment, purchase order, and above-listed information, transportation prepaid, to the service center address shown below.

   CI Service Center
   Route 40 East
   Casey, IL 62420–2054

4. Most repaired or replaced units will be returned within 30 or 45 days, depending on the product type and availability of repair parts. Repaired units are warranted for either 90 days from the date of repair or for the remaining unexpired portion of the original warranty, whichever is longer.

10. SPECIFICATIONS

10.1 Electrical Specifications

(a) ENERGIZATION POWER REQUIREMENT (EACH RELAY): 24 Vdc to supply 26mA.

(b) RELAY CONTACT RATING: 2A non-inductive, insulated for 600 Vdc maximum.

(c) POWER REQUIREMENTS: 21 Vdc to 28 Vdc at 78 mA, maximum.

10.2 Physical Specifications

See Table 3 for the physical characteristics of the 410 module.

Table 3. Physical Specifications

Feature	U.S.	Metric
Height	5.6 inches	14.2 centimeters
Width	1.5 inches	3.8 centimeters
Depth	6.0 inches	15.2 centimeters
Temperature	32 to 120° F	0 to 50° C
Humidity	To 95% (no condensation)	
Mounting	One module mounting position in a 400 mounting assembly.	