



INSTRUCTIONS

GEK-45378C
Supersedes GEK-45378B

DATA LOGGING AMPLIFIER

TYPE DLA52B

GENERAL  ELECTRIC

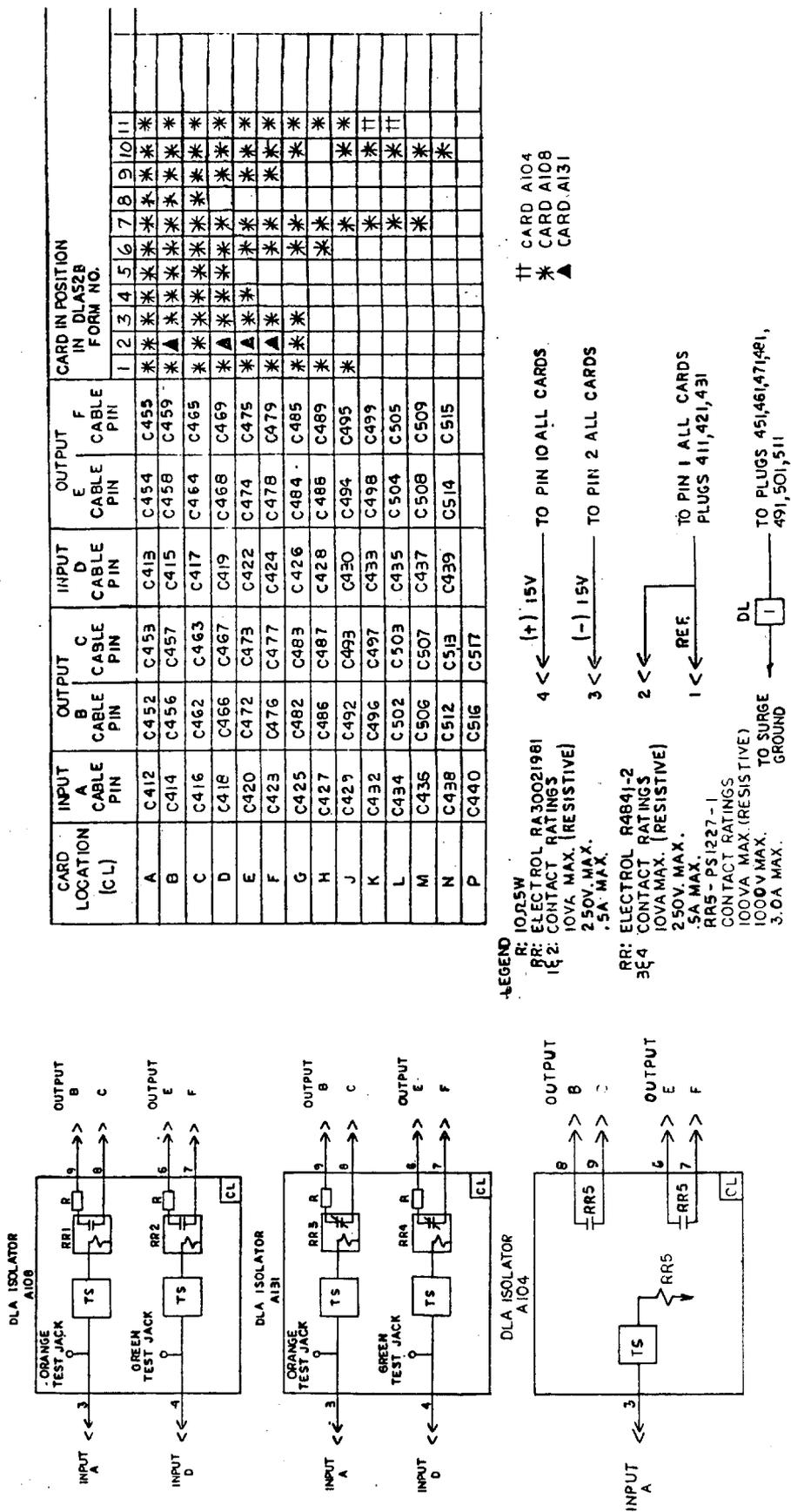


Figure 1 (0108B97 18-6) Internal Connections Diagram for the DLA52B Relay

* Indicates revision

DATA LOGGING AMPLIFIER

TYPE DLA52B

DESCRIPTION

The Type DLA52B is a data logging amplifier used to provide isolation and amplification of static relay logic signals for external monitoring. It is designed for use with General Electric MOD III static transmission line relay equipment, and is powered from the output of a Type SSA50, SSA51 or equivalent isolated plus or minus 15 volt logic DC power supply. One high speed contact output is provided per each logic point monitored, and the DLA can be ordered for any number of monitor points from two to 27. The DLA output contacts have a 0.5 millisecond operating time and are available as normally open or normally closed contacts.

This relay is packaged in a two rack high unit case suitable for mounting on a standard 19-inch electronic rack. The outline and mounting dimensions are shown in Figure 2, and the internal connections for the DLA52B are shown in Figure 1.

APPLICATION

The DLA52B is designed for use with MOD III static relays for transmission line protection. All MOD III SLA units (model numbers higher than SLA50) include facility for direct interconnection between the SLA and DLA units by a ten-conductor plug-in shielded signal cable on a socket designated C411, C421, C431. The logic points selected for monitoring inside the SLA are shown on the overall logic diagram and SLA option chart for the specific equipment. Different or additional logic points can be selected in the SLA by changing the option jumpers on the matrix connection blocks inside the SLA. Refer to the SLA internal connection diagram and option chart to determine the availability of various logic points for monitoring.

The DLA52B should be mounted at the static relay equipment and connected to the SLA unit and the power supply by plug-in shielded cable, provided by the factory, to avoid introduction of noise into static relay signal circuits. It will be necessary to determine whether there is sufficient reserve output capacity in the power supply for the particular equipment design to accommodate the DC burden of the DLA52B with the desired number of monitoring points.

The DLA52B dry contact outputs are brought out of the back of the DLA unit case on ten point plugs (C451 through C511). These outputs can be connected to a remote oscillograph or other monitoring device by direct connection via shielded cables, or by interfacing shielded cables from the DLA to terminal blocks at the static relay equipment, and connecting external cables from the equipment entrance terminal blocks to the remote oscillograph. The shields on the DLA output cables should be connected to the surge ground at the static relay equipment. It is recommended that the cables to the remote oscillograph be routed away from other power cables, and that the interconnecting cable lengths be restricted to 100 feet or less.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.

RATINGS

The DLA52B presents a maximum burden of 28 milliamperes to the positive DC power supply and 170 milliamperes to the negative DC power supply, when all circuits are on (LOGIC ONE). It presents a burden of 45 milliamperes to the positive DC power supply and 28 milliamperes to the negative DC power supply, when all circuits are off (LOGIC ZERO).

CIRCUIT DESCRIPTION

The DLA52B is used when monitoring relay circuitry functions involving current-sinking type logic, where the presence or absence of signals, rather than their magnitude, controls the operation. Therefore, with respect to the reference bus, signals below one volt represent an OFF condition (LOGIC ZERO), while signals resulting in an ON condition (LOGIC ONE) are generally in the range of plus 12 to plus 15 volts. Current-sinking type logic is a logic system where the output stage that is off actually draws current from the stage that it is driving to prevent it from turning on.

The circuit for a single DLA point is shown in Figure 4, two such circuits are on each printed circuit. The circuitry is basically that of a transistor switch. Its operation is as indicated below. The other half of the circuit is a duplicate of this half.

For a LOGIC ZERO input signal at pin 3, transistor Q1 will be turned off. Base current will flow to transistor Q2 turning it on. This will provide base current for transistor Q3, turning it on. The resistor divider from the collector of transistor Q3, to the negative DC voltage bus, is designed such that when transistor Q3 is conducting, transistor Q4 is reverse-biased. In other words, when transistor Q3 is turned on, the signal at the base of transistor Q4 is more positive than at its emitter; therefore, it will be turned off. With transistor Q4 turned off, there is no base current for transistor Q5. With transistor Q5 turned off, no current will flow through the relay coil.

For a LOGIC ONE input signal at pin 3, transistor Q1 will be turned on. This will sink base current for transistor Q3, turning it off. With transistor Q2 turned off, there is no base current for transistor Q3, turning it off. With transistor Q3 turned off, transistor Q4 will no longer be reverse-biased. Transistor Q4 base current will flow, turning it on. This will provide base current for transistor Q5, turning it on. This will sink current through the relay coil, picking it up.

CONSTRUCTION

The DLA52B is packaged in a metal enclosed case which is suitable for mounting on one standard 19-inch rack. The outline and mounting dimensions of this case and the physical location of the components are shown in Figure 2.

The internal connection diagram, Figure 1, has a table which lists the connections made to each card position. It also lists which type of card is used in that position. The Type A108 has A contact outputs, and the Type A131 has B contact outputs.

TESTING

GENERAL

The DLA52B is usually supplied from the factory mounted in a static relay equipment. All units for a given terminal of static relaying are tested together at the factory, and each has the same summary number stamped on its nameplate. When the DLA is furnished as a separate unit, it should be interconnected with the associated relay equipment via the shielded plug-in cables prior to testing.

INSTALLATION TESTS

WARNING:

THE LOGIC SYSTEM SIDE OF THE DC POWER SUPPLY USED WITH MOD III STATIC RELAY EQUIPMENT IS ISOLATED FROM GROUND. IT IS A DESIGN CHARACTERISTIC OF MOST ELECTRONIC INSTRUMENTS THAT ONE OF THE SIGNAL INPUT TERMINALS IS CONNECTED TO THE INSTRUMENT CHASSIS. IF THE INSTRUMENT USED TO TEST THE RELAY EQUIPMENT IS ISOLATED FROM GROUND, ITS CHASSIS MAY HAVE AN ELECTRICAL POTENTIAL WITH RESPECT TO GROUND. THE USE OF A TEST INSTRUMENT WITH A GROUNDED CHASSIS WILL NOT AFFECT THE TESTING OF THE EQUIPMENT. HOWEVER, A SECOND GROUND CONNECTION TO THE EQUIPMENT, SUCH AS A TEST LEAD INADVERTENTLY DROPPING AGAINST THE RELAY CASE, MAY CAUSE DAMAGE TO THE LOGIC CIRCUITRY. NO EXTERNAL TEST EQUIPMENT SHOULD BE LEFT CONNECTED TO THE STATIC RELAYS WHEN THEY ARE IN PROTECTIVE SERVICE, SINCE TEST EQUIPMENT GROUNDING REDUCES THE EFFECTIVENESS OF THE ISOLATION PROVIDED.

Since the DLA52B logic sections are basically transistor switches, adjustments are neither provided nor required. The various functions that are monitored, and therefore serve as inputs to the DLA, are covered in the overall logic diagram and descriptive writeup furnished with each equipment.

MAINTENANCE

PERIODIC TESTS

It should be sufficient to check the DLA outputs by observing oscillograph operation during periodic calibration tests made on the associated measuring units of the relaying scheme. No separate periodic tests of the DLA itself should be required.

TROUBLESHOOTING

By signal tracing using the overall logic diagram and the various equipment test points, it should be possible to quickly isolate a DLA malfunction. A test adapter card, 0108B9643G2, is supplied with each static relay equipment to supplement the test points provided on each amplifier card. Use of the adapter card is described in the printed circuit card instruction book, GEK-34158.

GEK-45378

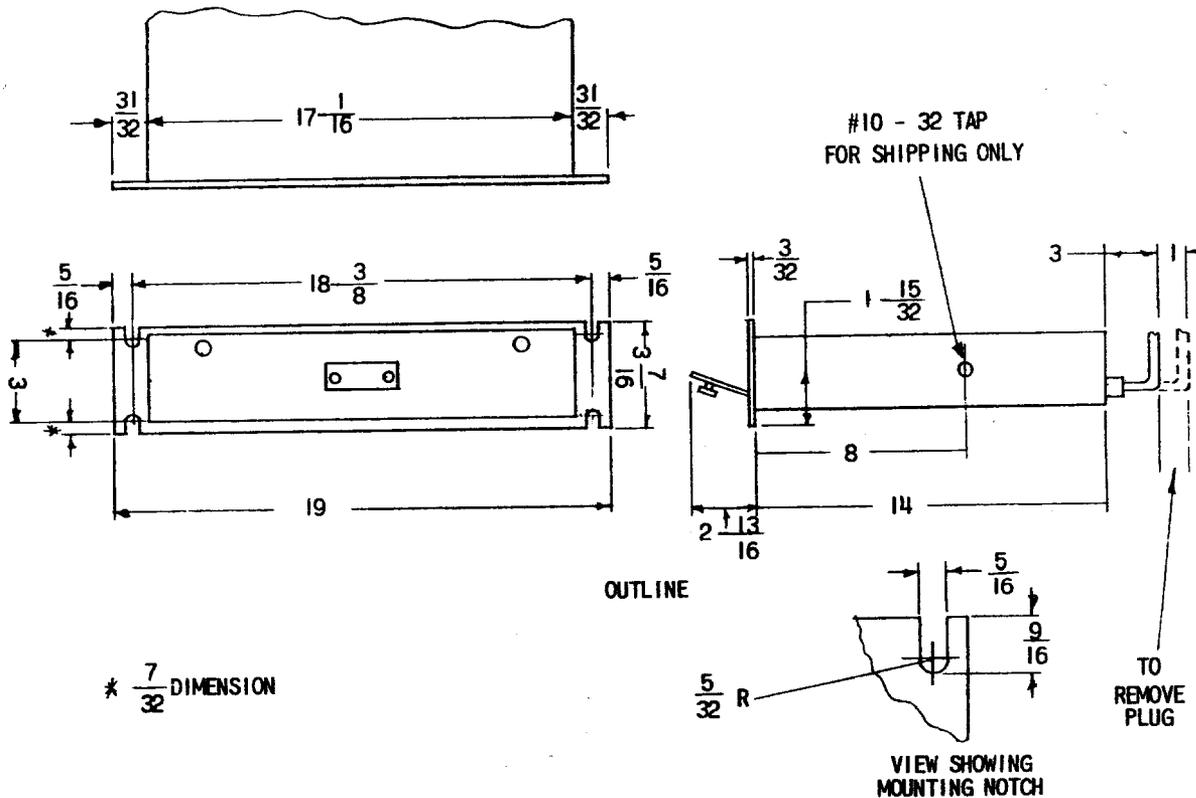


Figure 2 (0227 A2036-0) Outline and Mounting Dimensions for the DLA52B Relay

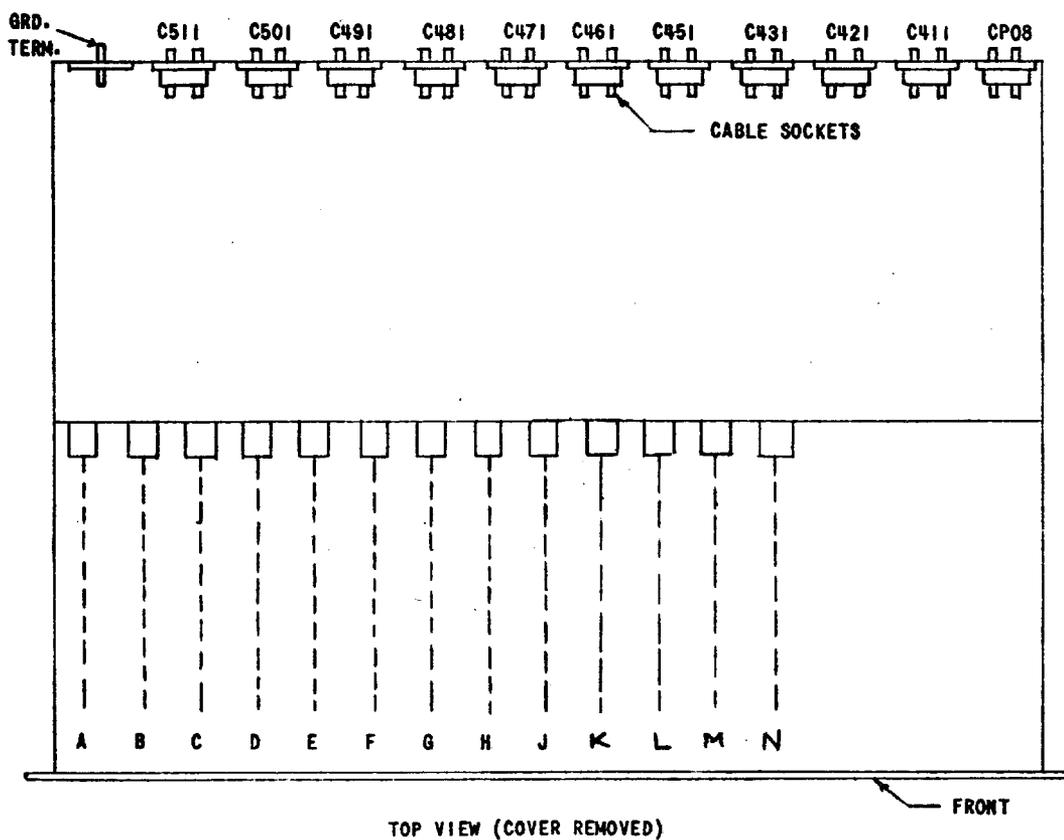


Figure 3 (0257 A6260-4) Component Location Diagram for the DLA52B Relay



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