635-Relay Board Test Procedure
(20-0620-00)

Factory Test Procedure

UPDATE DOCUMENT BEFORE RUNNING TESTS …

IMPORTANT: Every time the ZILOG version changes, **Step-1a** in this procedure must be updated, reprinted, laminated and replaced in all the binder sets used by manufacturing.

The information on printer setup is on the inside cover.

If the flash version is new:

1. **Open this document file**
2. click **File menu** and choose **PROPERTIES**

3. in the **Category field,** update the flash version (no dot - e.g. 477)
4. in the **Keywords field,** update the flash version (with dot- e.g. 4.77)
5. click **OK** to save

6. **Press <Ctrl+P> to open the print properties:**
   - » set **Printer** = 'EXCELSIOR\Copier'
   - » set **Page Range = '3 - 4'**
   - » set number of **Copies** = '3'
   - » click the PROPERTIES button
   - » set **Duplex** = "Open to the Left"
   - » set **Color** = "color" (IF DESIRED)
   - » *make sure staple is 'off'*
   - » click **OK** to send to printer (the flash version field will update automatically before it goes to print)

7. **Laminate the pages and punch holes**
8. **Replace the page in all the binders**

IMPORTANT: If any instructions are changed or updated, the document revision should be incremented (also found in the properties screen).

- *Updating the flash code version **does not** increment the document revision – the flash version is expected to change.*

- *If the test is altered in a major way (add, or delete an instruction, a diagram, etc.), then increase the number to the left of the decimal (i.e. change 4.0 to 5.0).*

- *If a correcting a typo/spelling error –OR- a modification to existing text or diagram is made to correct or clarify the existing instruction, then increase the number to the right of the decimal (i.e. change 4.0 to 4.1).*

SECTION-1: SET UP OF FACTORY TEST ENVIRONMENT

PURPOSE: This section designates the correct flash, prepares the test environment / loads flash to the factory test station.

STEP 1. TEST MATERIALS & REQUIREMENTS

PART INSTRUCTION

A **This test must use current Zilog Software version 2.0.1**

<< the zilog software is installed on the test PC >>

B **List of Materials:**

TEST BENCH

1) **Test PC:** *with* ***IE Explorer*** *and* ***Zilog software***
2) **Factory 600 Test Jig:** with 12 VDC power cables supplied
3) **Cable set:**
   - » LAN Cable,
   - » Zilog Cable (usb to 6-pin ribbon pigtail)
   - » 16-pin I2C ribbon cable,
   - » RS-485 two-wire cable

SUPPORTING HARDWARE (for 485 Data Bus validation / Relay Test)

4) Factory-designated **CPU board** using current flash
5) Factory-designated **DSI board** using current flash

OTHER ITEMS

6) **Serial Number Stickers**
7) **QC Stamp**
8) **CE Stickers**
9) **Baseline Relay board drawing**

<< advance to Part-C of the setup >>

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SECTION-2: VISUAL INSPECTIONS

PURPOSE: This describes the inspections done when comparing the target and baseline Relay board.

STEP 2. VISUAL INSPECTION OF TARGET BOARD

PASS ACTION: if the board passes ALL checks, advance to next Step.

FAIL ACTION: if a board fails ANY checks, take the appropriate actions to repair the board before proceeding with Factory Tests.

WARNING: Do not apply power to a failed board until the repairs are done!

PART INSTRUCTION

A. ORIENTATION OF COMPONENTS:

Perform the visual inspection of the ***target Relay board***.

✓ **VERIFY: all components are correctly oriented on the *Relay board***

✓ **VERIFY: a bag of 16 terminal connectors is attached**

B. INSPECTION OF BOARD AND SOLDER:

(*Inspect the front and back of the board*)

✓ **VERIFY: there are no obvious solder bridges** or **cold solder connections**

✓ **VERIFY: there is no obvious damage to the board**

✓ **VERIFY: that parts are not broken, pulled-up, or improperly installed**

SECTION-3: FACTORY TEST & PROGRAMMING

PURPOSE: This section covers the following:

- » executes relay tests on the Relay board
- » loads flash and factory default settings on the Relay board

STIPULATIONS

- STEP-1 (Setup) MUST be completed before running step-3
- STEP-2 (visual inspection) MUST be completed before running step-3
- PERFORM ALL instructions and tests in sequential order
- DO NOT abbreviate, modify or skip any steps
- DO NOT interrupt power to the board during testing or flashing
- a failed board must be retested starting from Step-2 after it has been corrected/repaired

STEP 3. SET-UP the FACTORY TEST JIG:

PART	INSTRUCTION

A **Connect the Test Jig to the Factory Bench:**

1. **TURN POWER OFF ON THE BENCH**
2. **connect power wires** to front of bench (observing polarity of the Red & Black lugs).

B **Install the 'designated CPU' into the LEFT SIDE Test Jig:**

1. Seat the **'designated CPU'** on the left side of Jig*;* connecting +12vdc cable
2. connect the ***16-pin I2C Ribbon Cable*** **to J8**
3. secure the hasp *as appropriate*

C **Install the 'DSI' into the Test Jig:**

1. Slide the **DSI** into upright position on the right side of Jig*,*
2. Plug the **12vdc power** cable into **DSI**.
3. Connect the **16-pin I2C Ribbon Cable** to the **DSI**
4. Connect **RS-485 Cable** to **Section-1 DSI (J8)**

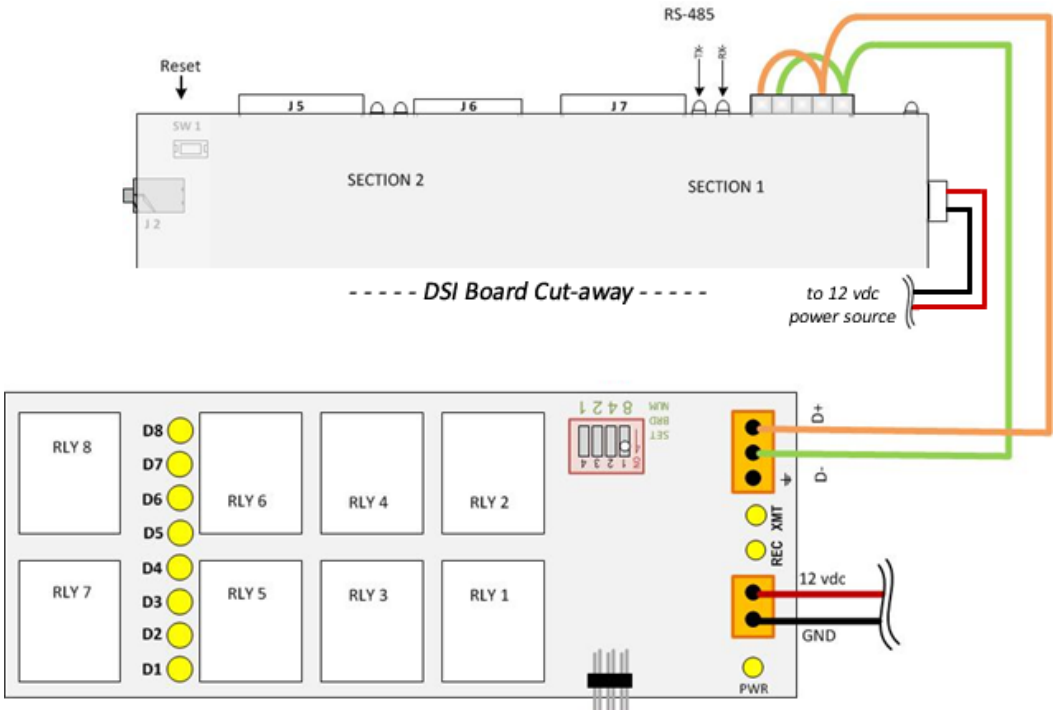
STEP-3 continued …

D **Connect the Relay board to the Test Jig:**

1. Place the **Relay board** flat on table beside Jig
2. connect **485 wiring harness** to Relay board
3. Connect **12vdc power** cable into **Relay Board** from the Test Jig

NOTE: the Test Jig should have 3 power cables (for CPU, DSI, and Relay board)

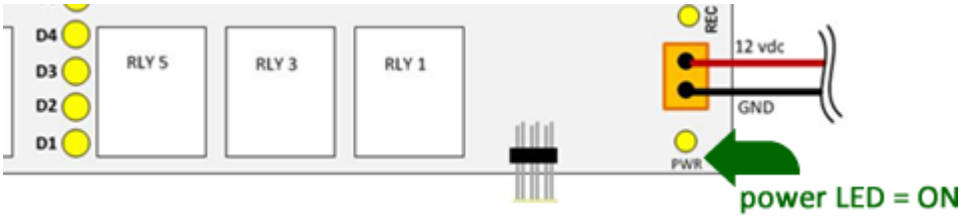
Reference Diagram: Use this diagram to help locate the connections.



STEP 4. TEST BOARD POWER:

A **Turn ON Power to the Test Bench** *at* the toggle switch.

✓**VERIFY: the Power LED is ON/solid.**

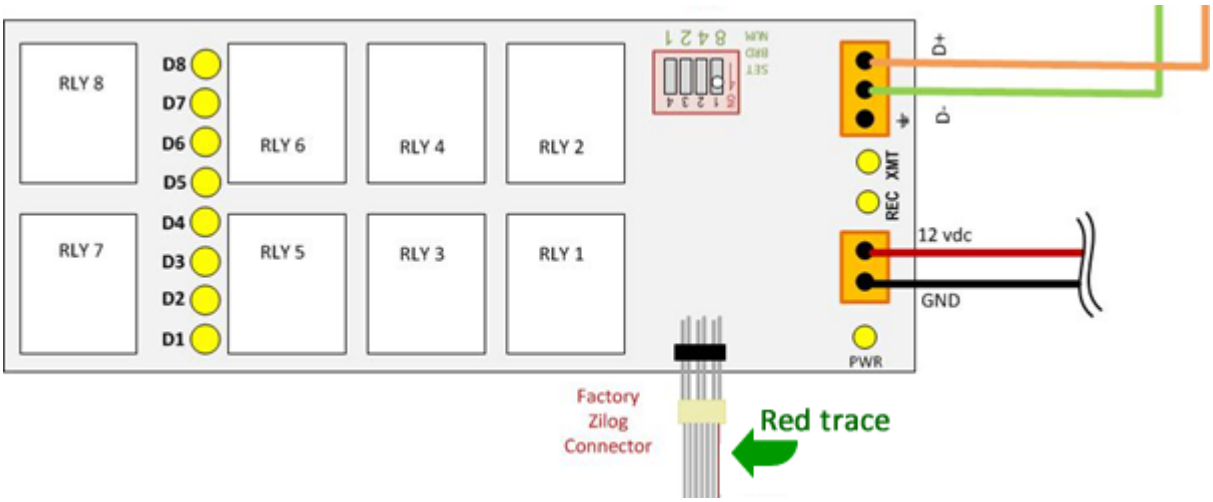


STEP 5. FLASH THE RELAY BOARD:

A **SET UP FOR BOARD TEST AS FOLLOWS:**

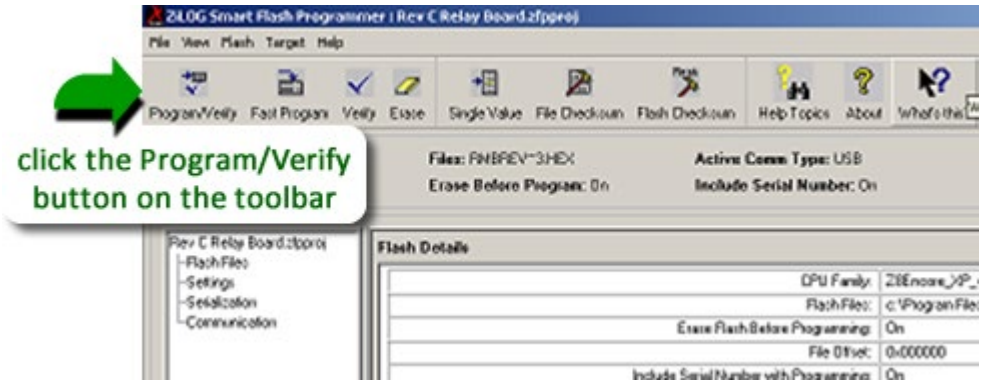
1. *the USB-end of the Zilog Ribbon Cable should already be connected to the* ***Test PC***
2. Connect the **Zilog Ribbon Cable** to the **Relay board**

make sure the red trace is toward the power connector of the Relay board (The "REC" LED on the 600 Relay Board should come ON.)

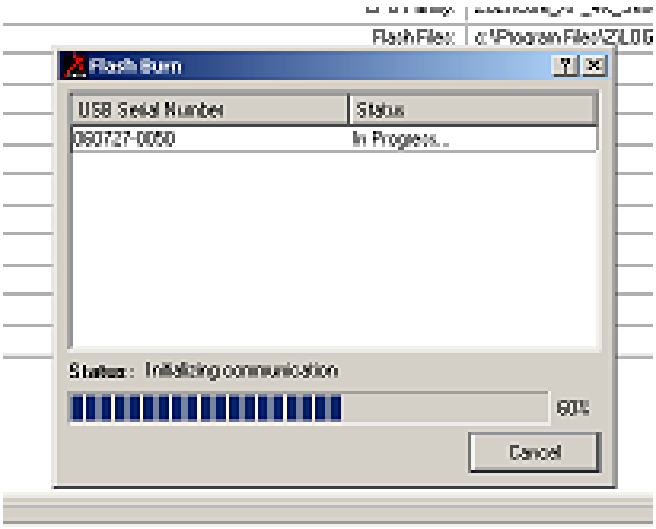


B **Launch the ZILOG software** from the PC desktop shortcut**.**

C Click the **[Program/Verify]** button on the tool bar



D **The program will begin flashing the Relay Board.**



E **unplug the Zilog cable** from the Relay Board after the flashing is complete

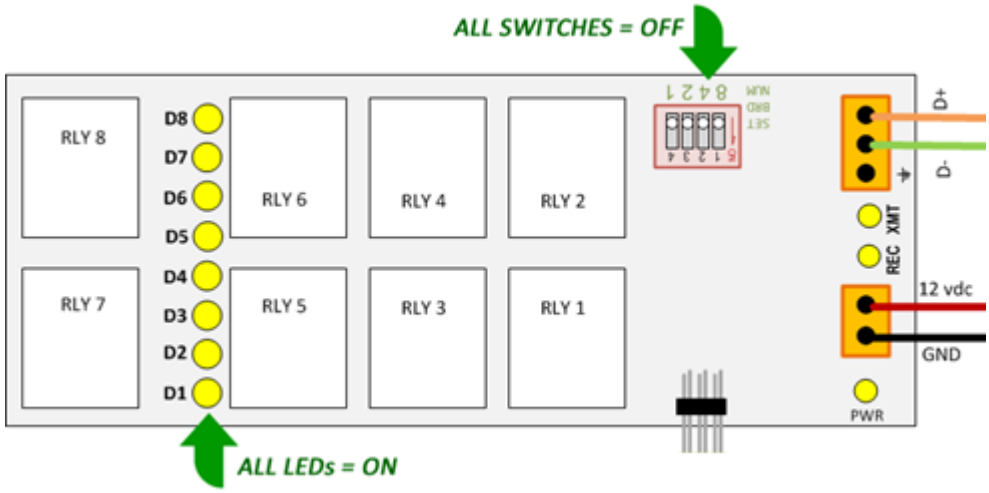
F **unplug the power cable** from the Relay board – this is required to burn in flash

G **plug in the power cable** to the Relay board again – to initialize the board

STEP 6. TEST RELAYS: This is a manual test of Relays and LEDs using the DIPSWITCH.

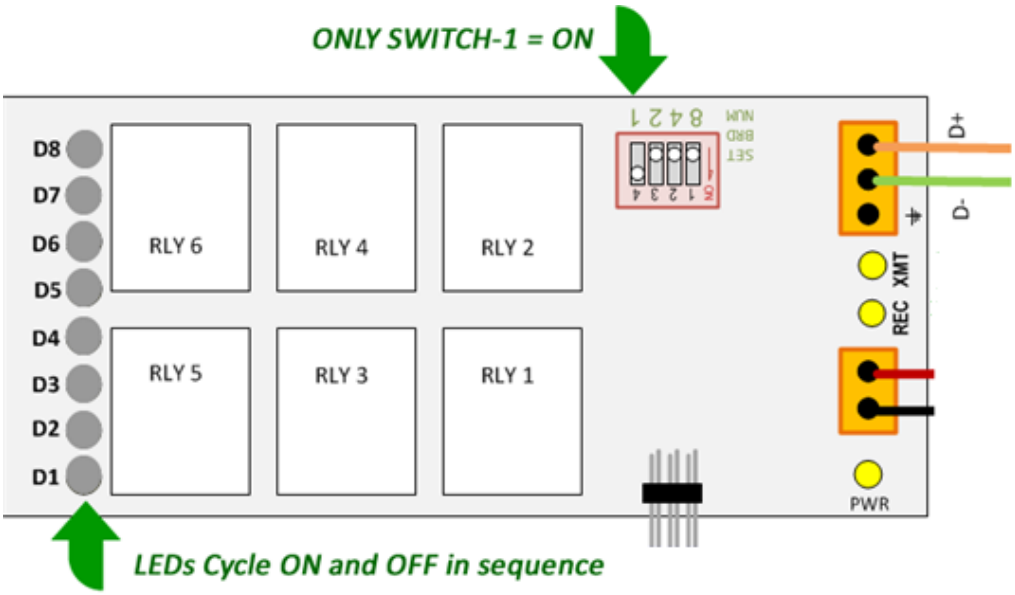
A Set all dipswitches to the **OFF** position.

✓**VERIFY:** that **ALL relays energize** and all **LEDs turn ON**



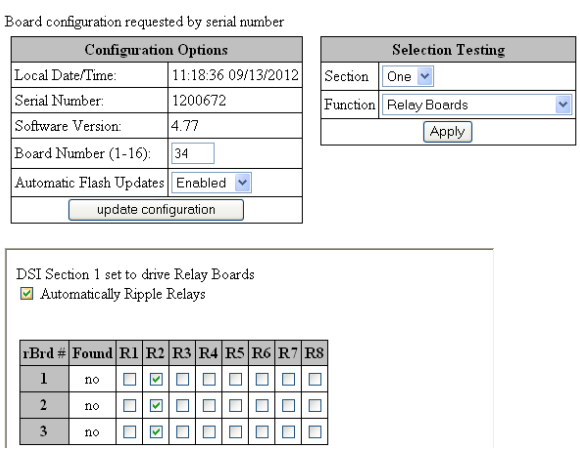
B Set only switch-1 to the **ON** position.

✓**VERIFY:** that ALL the **relays DE-Energize** and all **LEDs turn OFF**



B

1. **Launch the Internet Explorer** – *to connect to the CPU on the test jig.*
2. **Click the DSI serial number** *link to the board- this opens the DSI TEST PAGE*
3. **Choose 'ONE'** and set the ***DSI section-1*** to function **for 'Relay boards'**
4. **Click APPLY** button – *this will reveal the relay table*
5. CHECK (enable) the **Ripple Relay option**

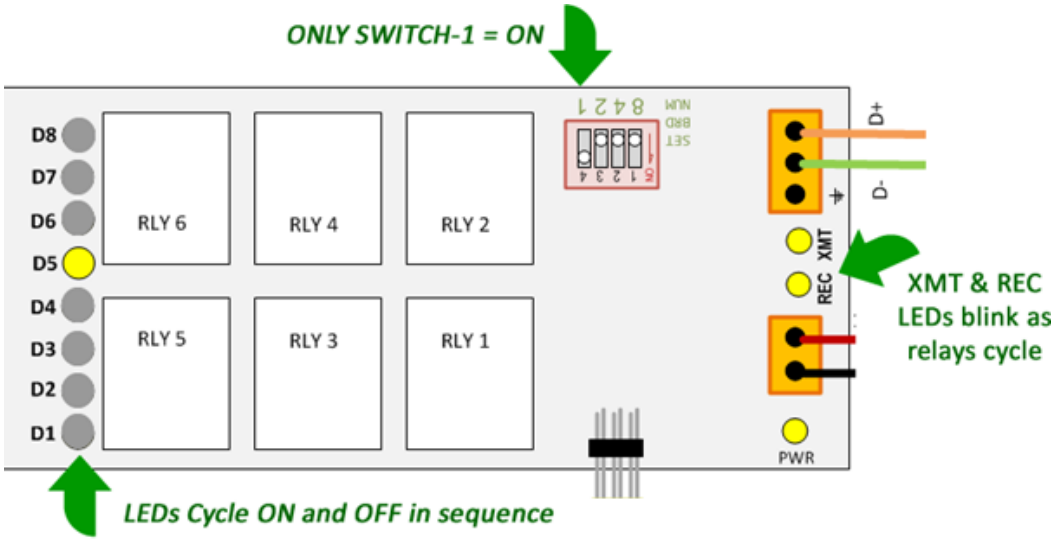


✓**VERIFY:** each Relay (1-8) and its **LED (D1-8) are cycled ON & OFF** in sequential order

✓**VERIFY:** **the XMT & REC LED's blink as each relay activates**.

- The REC blinks once with each relay click
- XMT blinks twice with each relay click (or twice as fast as the REC)

IMPORTANT: ***If relays are blinking in an erratic pattern the board must be reset and re-flash.***



STEP 7. FINISH BOARD: finish prepping the board for stock.

A Remove the RELAY BOARD from the Test Jig:

1. **Turn OFF power to the test Bench**
2. Disconnect **2-PIN power cable** at the RELAY BOARD
3. Disconnect the ***485 two-wire Cable*** at the RELAY BOARD
4. Leave the Relay Board addressed to "1"

B Affix the board stickers:

1. QC Stamp
2. Serial Number sticker
3. CE sticker
4. verify contents of attached Ziploc bag :

16	terminal connectors (for relays)
1	2-pin orange connector (power)
1	3-pin orange connector (485 data)

C RETURN TO BEGINNING OF PROCEDURE TO CONTINUE TESTING NEXT BOARD

D When finished testing all boards, store the ***factory-designated baseline board*** in the pocket of the Primary Test Procedure. Also store the **485 harness** in the pocket of this procedure.