# 600-DPI (*20-0268-40)*

## *Dealer Factory Flash Procedure*

### *UPDATE DOCUMENT BEFORE RUNNING TESTS …*

**IMPORTANT:** Every time the flash 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.

# *INSTRUCTIONS TO UPDATE THE FLASH & REPLACE PAGE*

***Do the following steps to update the document:***

1. **Open the document file in MS Word**
2. Open the **DOCUMENT PROPERTIES** for editing
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 properties.
6. Go to Section-1 Part A (p. 3): **place cursor in the flash field** & **press the F9 key**; the version field should update to the correct version.
7. On same line, **place cursor on the file name version and press F9 key** to update the file name version number.
8. **Press <Ctrl + S>** to save the entire file.
9. **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
10. **Laminate the pages and punch holes**
11. **Replace the page in all the binders (1 & 2 factory manager copies)**

***IMPORTANT: If steps/ instructions are changed or updated, the document revision should be incremented*** *(revision number is found in the in the Comments field of the Properties screen)**.***

- *Do NOT increment the revision number when updating the flash code version– the flash version is expected to change.*
- *Increment the revision number to the **left of the decimal** (i.e. change 4.0 to 5.0) if an instruction, test or diagram is changed, added or removed.*
- *Increment the number to the **right of the decimal** (i.e. change 4.0 to 4.1) If a correcting a typo/spelling error –OR- a modification to existing text or diagram is made to clarify the existing instruction.*
- *After changing the revision number, open the header on page1 and update the field by pressing the F9 key when the cursor is on the rev number field.*

# SECTION-1: Setting up the FACTORY TEST STATION

PURPOSE: This section covers loading the correct flash into the Factory Test Station.

## STEP 1. TEST MATERIALS & REQUIREMENTS

| PART | INSTRUCTION |
|---|---|

**A** **This test must use current flash version 5.04 *((DPI600_504_release.s28))***

**<< This step must be updated when the *flash version* and *file name* changes >>**

**B** **List of Materials:**

### TEST BENCH

1) **Test PC:** *with* ***HyperTerminal***
2) **Factory Test Station:** *loaded with correct Flash*– according to **Step-1A**.
3) **Cable set:**
   - » RS-232 Serial cable
   - » 14-pin Factory Test ribbon cable
   - » 16-pin I2C ribbon cable
4) **Factory 600 Test Jig:** with 12 VDC power supplied
5) **Factory-designated 600 CPU board:** *needed for I2C Data Bus validation*

### OTHER ITEMS

6) **Pre-built F-BUS Jumpers** (across SENSE and GND) (may only apply to certain rev. boards)
7) **Serial Number Stickers**
8) **QC Stamp**
9) **CE Stickers**
10) **Factory-designated Baseline DPI:** marked/flagged used for visual inspection
11) **Volt meter -** for checking DC voltage

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

## C Setting up the Factory Test Station:

1) **connect the RS-232 Serial Cable** to front of Factory Test Station (bench/controller)
2) **power-up Factory Test Station** (or controller)
3) open **HyperTerminal** session using the following connection settings
   - ***Baud*** *= 57600;*
   - ***Bits*** *= 8;* ***Stop Bit*** *= 1;*
   - ***Parity*** *= None; and* ***Flow Control*** *= None*
4) Type the following commands into the HyperTerminal window:
   - » press **<enter>**
   - » type **'select'** and **<enter>** *(the select command returns a menu list of boards)*
   - » type **'3'** and **<enter>** *(to choose a 600 DPI as the target board)*

### LOADING INITIAL FLASH INTO FACTORY TEST STATION

5) Type "**load**" and **press <Enter>** ( a countdown will begin "CCC…" ; see note below for retry)
6) select ***Transfer > Send File*** from the HyperTerminal menu
7) click **[Browse]** button
8) click **[My Computer]** button
9) quickly **navigate** to **C: > Factory Test > S28 files > 600 > 600 DPI > DPI600_nnn_release.s28.**
10) click **[Open]** button
11) choose **'1K XMODEM'**
12) click **[Send]** button (to begin the transfer of flash code to the Factory Test Station)

**NOTE: if HyperTerminal times out 'CCC…' before the transfer begins, simply repeat steps 6 thru 12.**
The file transfer should start on the second attempt, because you are now pointed to the correct folder location and won't loose time browsing.

**NOTE:** Part C must be done when …
- the flash version initially changes

*The memory sector that stores flash code for the* ***daughter boards*** *does not get overwritten when you load flash for testing 635-series daughter boards.*

# SECTION-2: VISUAL INSPECTIONS

PURPOSE: This describes the inspections done when comparing the target DPI to the baseline DPI.

## 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 completed!**

| PART | INSTRUCTION |
|---|---|

### A. ORIENTATION OF COMPONENTS:

Perform the visual inspection by comparing the ***target DPI*** to the ***baseline DPI***.

✓ **VERIFY: all 'marked' components are correctly oriented on the *target DPI***

✓ **VERIFY: both supervision resistors are installed**

### 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 manual & automated tests on the DPI
- » loads flash and programs factory default settings on the DPI

**STIPULATIONS**

- STEP-1 (Setup) MUST be completed before running step-3
- STEP-2 (visual inspection) MUST be completed before running step-3
- ALL instructions and tests MUST be performed in sequential order
- DO NOT abbreviate, modify or skip any steps
- DO NOT interrupt power to the board during testing
- 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** (observing polarity) to the Red & Black lugs on front of bench.

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

1. Seat the **'designated CPU'** on the left side of Jig, align pins ~ OR ~ use +12vdc cable
2. connect the ***16-pin I2C Ribbon Cable*** **to J8** (this will be used later)
3. secure the hasp *as appropriate*

## *STEP-3 continued …*

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**C** **Install the 'target DPI' into RIGHT SIDE of the Test Jig:**

1. Install the ***loopback harness*** - to the DPI (reader, lock and relay ports)
2. Seat the **target DPI** on the right side of Jig*:* align pins – OR – use 12vdc power .
3. Secure the **safety hasp / lock-bar**
4. Connect the ***14-pin Factory Ribbon Cable*** to the **target DPI (J2)**
5. Connect ***RS-232 Cable*** to **Factory Test Bench**

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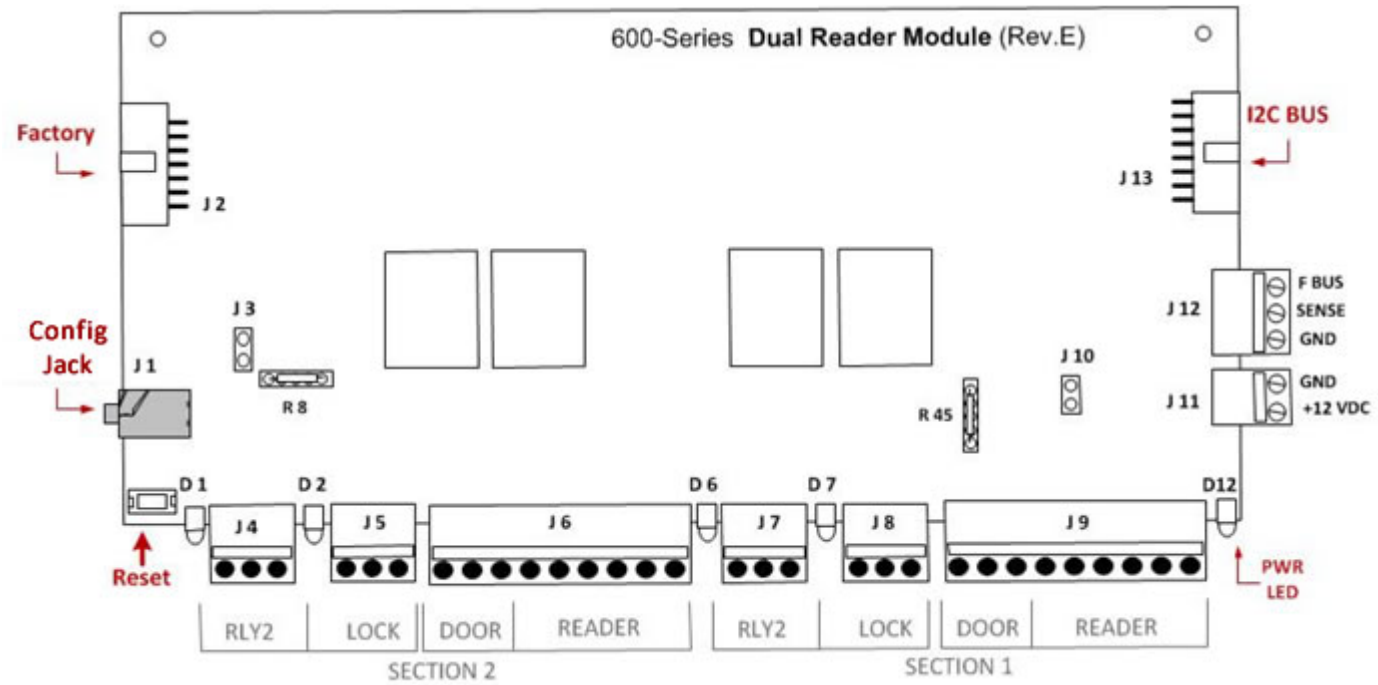
**Reference Diagram:** Use this diagram to help locate the connections.

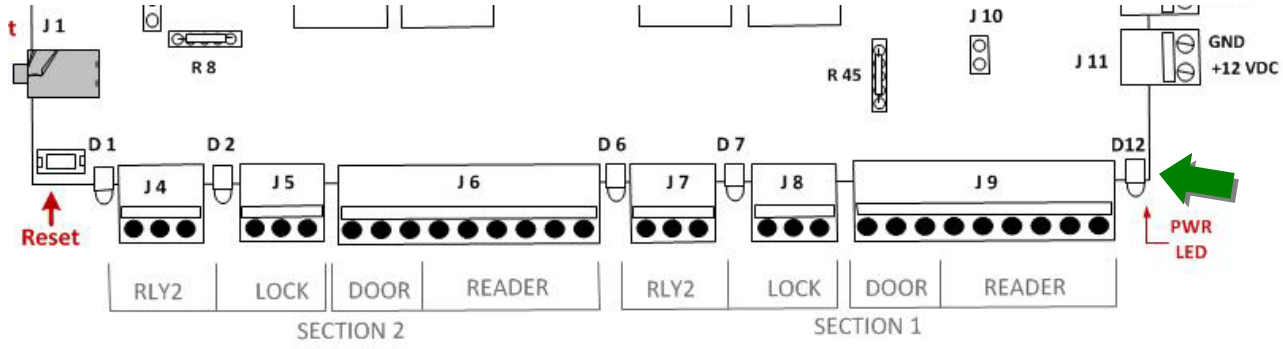
*The board should be oriented in this same position when placed on the Test Jig.*



## STEP 4. VERIFY BOARD POWER:

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

✓**VERIFY:** **the Power LED (D12) is ON/solid.**

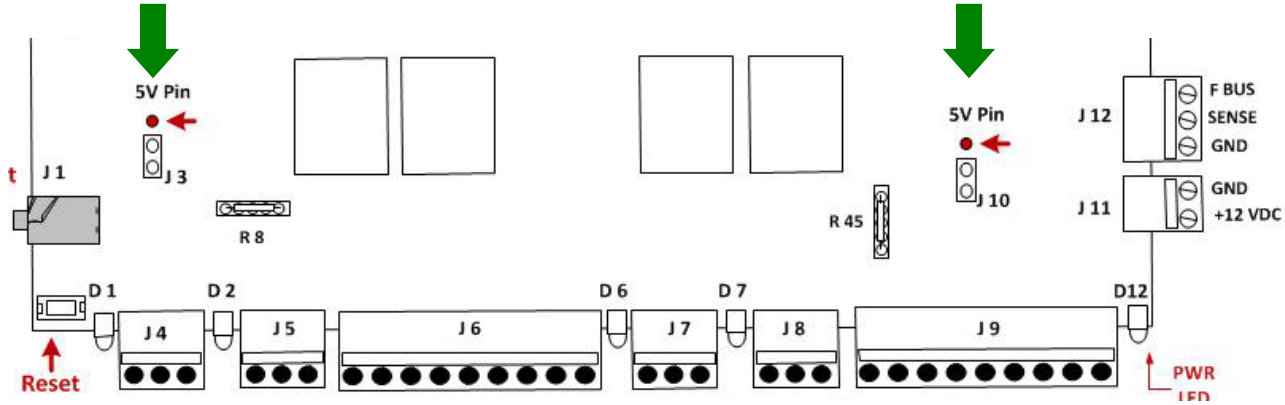



***B*** **CHECK Power** *at* the reader voltage jumpers, using the volt meter.

1. Set the **volt meter** to read Volts DC.
2. Connect the negative meter lead to the ground-lug on the *Test Bench*
3. Touch the positive lead to the 5V PIN on each jumper (J3) and (J10).

✓**VERIFY:** **the meter reads <u>+5 VDC at J3 and J10</u>.**

✓ **VERIFY:** that the **black jumpers are installed in the 12V position**



## STEP 5. RUN THE DPI BOARD TEST:

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

- *the **Factory 14-pin Ribbon Cable** should already be connected to the **DPI (J-2).***
- *the **RS-232 Serial Cable** should already be connected to the **Bench***
- **HyperTerminal should be open**: *Com Port settings should use: 57600Baud; 8-Bits; No Parity; 1-Stop Bit; No Flow Control*
- **Caps Locks should be OFF** - *all HyperTerminal commands are all lower-case*

***B*** **Press <Enter> key** to get the command-line prompt to appear.

***C*** type **"run"** and press <**Enter**>

```
test 5081> select
Select the type of board(s) you wish to test:
   1 = 508i,     eZ80 replacement CPU for 508 controllers.
   2 = 600 CPU,  CPU for 600 controllers.
   3 = 600 DPI,  DPI for 600 controllers.
   4 = FTS,  eZ80 CPU for the Factory Test Station.
select> 3
test 600 DPI> run
```

✓**VERIFY:** the test **pauses at "Step 9e Remove FIRE JUMPER"**

**!!! DO NOT HIT <SPACE> YET !!!**

***Turn the page to advance to the next step.***

```
  test skipped, no CS8900A on this board.
Running Test 6 - Test on board DIP switches.
  test skipped, no switches on this board.
Running Test 7 - Test interface to 85C30.
  test skipped, no 85C30 on this board.
Running Test 8 - Test Flash memory.
  test skipped, no FLASH chip on this board.
Running Test 9 - 600 DPI/ 635 DPI / SAC loop back test.
  9a. Checking for FIRE jumper.
  9b. Applying Test Vectors.
  9c. Ramp test on Section 1 door sense.
  9d. Ramp test on Section 2 door sense.
  9e. Remove the FIRE jumper, then hit space
-
```

## STEP 6. EMERGENCY RELEASE TEST: tests of the Emergency Release feature.

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**A** When you see the prompt **" 9e. Remove the FIRE jumper…"**

1. Press and hold the **FIRE TEST button**
2. then press the **<space bar>**

✓**VERIFY:** **the PC prompt changes to " 9f. ReInstall FIRE jumper…"**

```
9e. Remove the FIRE jumper, then hit space
9f. ReInstall the FIRE jumper, then hit space
```

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**B** When you see the prompt **" 9f. ReInstall FIRE jumper…"**

1. Release the **FIRE TEST button**
2. press the **<space bar>**

✓**VERIFY:** **the PC prompt changes to "test 9 passed."**

```
9f. ReInstall the FIRE jumper, then hit space
  test 9 passed.
Running Test 10 - 600 DIO relay test.
  test skipped, not a 600 DIO.
Running Test 11 - 600 DIO input test.
  test skipped, not a 600 DIO.
Running Test 12 - Test 600/635 CPUs inputs: tamp
  test skipped, not a 600/635 CPU.
Running Test 13 - DSI RS-232 and RS-485 loop bac
  test skipped, not a 600 DSI.
All tests completed
test 600 DPI>
```

## STEP 7. PROGRAMMING THE TARGET BOARD: this step covers configuring the Serial Number and loading the .S28 Flash file to the target DPI.

### A Start the programming mode:

1. type "**program**" and press <**Enter**>
2. Type in the **8-digit serial #** and press <**Enter**>.

***NOTE: The serial number printed on the sticker may not show the leading zero, but it must be entered.***

✓**VERIFY:** that flash version is correct (according to Step-1A)

```
All tests completed.
test 600 DPI> program
Enter Target's serial number: (max is 16777215)
12345678
02000762
You are about to program the TARGET board as a

    600-Dual Port Intelligent Module, Version 4.77

Do you wish to proceed? (yes/no)
-
```

C type "**yes**" and press <**Enter**>

*~ the Flash file will load to the board*

✓**VERIFY:** flash and **completes successfully**.

```
Do you wish to proceed? (yes/no)
yes
  Setting the FLASH frequency divider register
  Setting the FLASH protection register
  Mass erasing the FLASH memory
  Programming the FLASH memory
    0x00EF80
  Programming the FLASH memory - complete
Verifying Target FLASH
All bytes matched
  Writing Configuration Data
  Setting the FLASH frequency divider register
  Setting the FLASH protection register
  Erasing the configuration area FLASH memory
  Program the configuration data
    0x00FC00
  Configuration programming - complete
test 600 DPI>
```

## STEP 8. Validating I2C BUS and Board Settings via HyperTerminal: This step confirms the serial number and flash version are correct, validates the RS-232 and I2C ports are working and that daughter boards can be detected.

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**A** ***Connect the test cables as follows:***

**1)** Disconnect the ***factory ribbon cable*** from the ***target DPI*** **(J-2)**.
**2)** Connect the ***16-pin I2C-Buss ribbon cable*** to the **CPU (J-8)** and the **target DPI (J13)**.
**3)** Swap the **RS-232 cable** to the **CPU J4**

**B** **reset SW-1 on the CPU**– *the PC prompt will change to "login:"*
**type "install" and press <enter>**

```
test 600 DPI> ......
G......
GCS Boot Loader - Version 4.77

login: install
```

**C** **reset SW-1 on the DPI** and notice the **CPU's XMIT LED flickers once**

✓**VERIFY:** **the CPU's LED (D5) flickers once when the DPI is RESET**. *This indicates that the DPI is attempting to communicate with the CPU. You may reset the DPI again if needed to induce the flicker.*

**D** **then type "boards" and press <Enter>**

*(It may take a minute for daughter boards to display; re-issue 'boards' command if needed).*

✓**VERIFY:** the boards command returns the correct information…

1) **both boards are displayed** - *CPU* and target DPI
2) **DPI serial number** is correct (entered during Step-7)
3) **DPI board flash version** is correct (see step 1A)
4) **DPI board ID = 34**

```
> boards
Ref  Type      Serial #  Version  Boot   Pos  Status     Age
  0  600-CPU   0200NNNN    X.XX    X.XX     1
  1  600-DPI   0200NNNN    X.XX    X.XX    34
>
```

## STEP 9. FINISH BOARD: finish prepping the board for stocking.

**A Remove the TARGET DPI from the QC Test Jig:**

1. **Turn OFF power to the test Bench**
2. **Disconnect 2-PIN power cable** from the DPI
3. **Disconnect *I2C Ribbon Cable***
4. **Remove the DPI** from the Test Jig

**B Affix the board stickers:**

1. Install the F-**BUS Jumper/orange connector** (jumper installs across Sense and GND)
2. **Serial Number** sticker
3. **CE** sticker
4. **QC Stamp**
5. verify contents of attached **Ziploc bag** :

| | **ZIPLOCK #1** |
|---|---|
| ***1*** | 2-pin connector (power) |
| ***2*** | 9-pin connectors (reader ports) |
| ***4*** | 3-pin connectors (relays 1 & 2 on both ports) |
| ***1*** | 3-pin connector (emergency release (FBUS) |
| ***1*** | Insert: instructions showing how to install the FBUS connector |
| | **ZIPLOCK #2** |
| ***2*** | Surge-suppression diodes (for EOL locks) |
| ***1*** | Insert: instructions for installing diodes |

**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.

**DO NOT PRINT OR POST THIS PAGE IN THE FACTORY TEST BINDERS**

*Revision History Table*

| DATE OF REVISION | REVISION DESCRIPTION | UPDATED BY |
|---|---|---|
| 1/14/2014 | Updated flash version from 4.77 to 5.04 | C. Roberts |
| 1/17/2014 | Added the Revision History Table | C. Roberts |
| 1/15/2014 | 1. Revised and clarified the Print Instructions on page 2 to include the steps to manually update the flash version field in case the field doesn't auto-update when sent to printer.<br>2. Repaired header to display the document rev number | C. Roberts |
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