

Thermo Scientific
This update applies to all iSeries Model 81i
Firmware Version 03.00.00.177

*****WARNING*** ***WARNING*** ***WARNING*** ***WARNING*****

iPort Software version 01.04.02 (latest included installation image with this software update) or greater is required to install this update. Earlier versions of iPort could cause the instrument to lock up during the installation process and require the processor board to be replaced.

OVERVIEW

The firmware for the Model 81i Mercury Calibrator is loaded into the instrument's FLASH memory at the factory, but it may be necessary to load updated firmware into the instrument as new features become available.

This release includes two file, 81i030000.bin and 81i030000.cramfs, which can be used to update the Model 81i only.

Before attempting to upgrade the firmware, it is advisable to check that the instrument is a model supported by this update and that it is currently running an upgradeable version of firmware. This information may be viewed by going to the DIAGNOSTICS > PROGRAM VERSION(S) screen. Make sure that the PRODUCT field matches one of the models listed above and the VERSION field matches one of the following release versions:

00.04.13.016	01.06.10.123
00.04.14.017	01.06.12.133
00.04.25.028	01.06.16.137
00.04.54.058	02.00.00.141
01.00.00.078	02.01.04.147
01.00.01.079	02.02.00.153
01.00.16.097	02.02.07.167
01.06.00.106	02.02.09.174

If the instrument is not running a version listed above, it is not field upgradeable using this procedure. Contact our Technical Support for special upgrade instructions or specific information regarding changes to any firmware versions.

The entire firmware update process should take about 30 minutes at 57,600 baud over serial or 5 minutes over Ethernet. There are two steps to upgrading the firmware:

- A. Backup configuration/calibration data onto PC
- B. Upgrade firmware

Note: It may be convenient to print this file out before continuing with the firmware upgrade.

A. BACKUP CONFIGURATION/CALIBRATION DATA

Thermo highly recommends backing up configuration and calibration data before performing a firmware update. If this information is somehow lost or corrupted during the update, then a complete recalibration of all sensors and outputs would be required if this data was not saved.

This procedure assumes that Thermo iPort has already been installed onto a PC and has been configured to communicate with the instrument (over serial or Ethernet). Before updating the firmware, the instrument's current settings should be saved to a data file on a PC.

This procedure is described below:

1. Run iPort. Bring up the connection to the instrument using Instrument > Poll Serial or TCP Connect.
2. Once the instrument's window is displayed and selected, select Instrument > Backup/Restore > Backup Config to back up the configuration from the currently selected instrument to a file on the PC.
3. In the Open dialog box, select the appropriate folder and type in a filename for the backup file, then click Open to retrieve the data from the instrument and save it to the file.

B. UPGRADE FIRMWARE

Below is a procedure for loading the firmware into FLASH memory. The firmware update file transfer process should take about 30 minutes at 57,600 baud. It is assumed that iPort is already talking to the instrument and the instrument window is currently open.

NOTE: DO NOT TURN OFF THE INSTRUMENT AT ANY TIME DURING THIS UPDATE
If the instrument is turned off while burning the new image to the FLASH, it may require replacement of the CPU board, motherboard, I/O expansion board, and/or measurement interface board. To reduce this risk, make sure the instrument is running on clean and stable power before performing this update.

1. Close all instrument windows.
2. From the iPort menu, select Instrument > Update Firmware. Select TCP/IP or Serial, depending on the connection.
3. In the Update Instrument Firmware Program dialog box, enter the instrument ID (if using serial port) or the TCP/IP address (if using TCP/IP).

4. In the Open File dialog box, select the firmware update file, then click the Open button.
5. File transfer progress can be monitored by looking at the transferred blocks in the lower left corner of the iPort window as well as on the instrument's display.
6. Once the file transfer is complete, the instrument will automatically reboot. There may be some error messages regarding configuration and calibration files that are displayed, this is normal after a firmware update. At this time, the bootloader and application code in each of the low-level processors will be updated to the latest version.
7. To verify all updates were successful, go to the ALARMS menu and make sure the board status alarms at the bottom of the menu all show "OK". If any board status alarms show "FAIL", try rebooting the instrument and checking the ALARMS menu again. If they still show "FAIL", contact technical service.

RELEASE NOTES

Version 03.00.00 changes from version 02.02.09:

1. Remove telnet support.
2. Fix boot issue on new iSeries+ processor boards.
3. Fix streaming protocol so the instrument doesn't hang on Ethernet port scan.
4. Fix static gateway address setting so it's saved between power cycles when DHCP is off and update gateway when changed by user (no longer requires instrument reboot).
5. Invert signs in time zone labels to match the actual functionality and change "GMT" to just "UTC".
6. Update logo on splash screen.
7. Fix RS-485 user serial port communications.
8. Fix Modbus write coil error to respond with data error instead of address error if the wrong data is written to the coil.
9. Modify MFC's flow_in_out_tbl with the version from the 146i calibrator.
10. Add MODBUS support for date and time correction.
11. Fix CLINK "mb read registers" and "mb read coils" commands.
12. Improve CLINK protocol communication over serial port.

Version 02.02.09 changes from version 02.02.07:

1. Added Modbus write coils to change the range on the 81i-H: Range 20, Range 30, Range 50 and Range 300.
2. Fix "set format", "set lrec format", "set srec format", and "set erec format" CLINK commands to save the new setting if the source of the command is serial.
3. Fixed "set program bootloader procboard" CLINK command so that it no longer causes iSeries+ units to hang.
4. The "host name" CLINK command now responds with a <space> if no host name is found. If "set host name" data does not pass validation, it now responds with "data not valid" instead of "bad command".

5. 81i-H cooler set points for each concentration range are now individually settable and saved.

Version 02.02.07 changes relative to version 02.02.00:

1. Add support for High Level and Low Level 81i Calibrator Models
2. Fix output of "Hg Span", "syssp" in logged data to be an integer value between 1 and 6
3. Fix logged data averaging where the sum was divided by 'n + 1' instead of 'n' seconds, yielding a possible 1.6% error in logged concentration data for 1-minute logging or 0.03% error in hourly concentration data.
4. Fix handling of IP addresses with 3 digits in each of the four fields in INSTRUMENT CONTROLS> COMMUNICATIONS> TCP/IP SETTINGS> IP ADDRESS screen.

Version 02.02.00 changes relative to version 02.01.04:

5. Add support for 81iL.
6. Fix version string in cramfs image used by iPort during a firmware update so iPort will report the file's version correctly.
7. Fix softkey assignment screen to always show SAVING message for three seconds after the enter key is pressed.
8. Add support for new processor board revision 1.5T.

Version 02.01.04 changes relative to version 02.00.00:

1. 81iH functionality is included here but not completely implemented. **DO NOT USE.**
2. Minor mode changes related 84i.
3. Updated kernel to support future iSeries plus processor board.

Version 02.00.00 changes relative to version 01.06.16:

1. Remove Gesytec protocol from valid protocol list
2. Gas mode menu now does not allow changes if password locked
3. Add message to cycle power when changing NTP server IP address
4. Set alarm when communication with MIB is lost and clear it when it's re-established

Version 01.06.16 changes relative to version 01.06.12:

1. Add a space between model and version strings.
2. Display the cooler set point in IPort without button.
3. Replace string "STD FLOW :" with "STD FLOW:", and "VOL FLOW :" with "VOL FLOW:"; removed space before ":".
4. Modify alarm cooler temperature max value from 10.5 to 12.5.
5. Modify the default value for alarm cooler temperature max from 10.0 to 10.5
6. Modify the dilution flow table for model 81i low.
7. Modify meas_reset_hg_span_conc() to get the default Hg spans.
8. Modify the default values for Hg span concentrations. Set default values for Hg span concentrations for 81i Low.
9. Modify the lowest value in the gas control table from 25 sccm to 5 sccm.

Version 01.06.12 changes relative to version 01.06.10:

1. Change maximum pressure alarm limit from 1200 to 1800.
2. Change default pressure high alarm from 950 to 1200.
3. Fix possible lockup during analog input initialization.
4. Increase precision of 'diag volts' CLINK commands.
5. Fix display pixel test screen message to show RUN instead of RIGHT ARROW TO EXIT.

Version 01.06.10 changes relative to version 01.06.00:

1. Fix precision values in output list and use them for printing logged data.
2. Add list index validation on power-up.
3. Adjust dilution flow analog output FS table entry for conversion to LPM.
4. Add warning when instrument fails to calibrate the ambient temperature.
5. Change the default hg flow alarm level from 60.900 to 60.000.
6. Fix analog input processing so the values are read from the I/O Expansion board.
7. Fix GAS MODE screen to replace INSTRUMENT/ORIFICE/SYSTEM CAL with INSTRUMENT/ORIFICE/SYSTEM SPAN in the title bar strings.
8. Fix DIAGNOSTICS> PRESSURE screen to remove the extra arrow in the lower right corner.
9. Add missing ENTER symbol to SERVICE> ANALOG INPUT CALIBRATION> INPUT CHANNEL #> CALIBRATE FULL SCALE screen prompt.
10. Change " Hg FLOW" to " HG FLOW" in INSTRUMENT CONTROLS> I/O CONFIGURATION> OUTPUT RELAY and DIGITAL INPUT screens for consistency purposes.
11. Change "ORIFICE CAL" to "ORIFICE SPAN" in GAS MODE, OUTPUT RELAY and DIGITAL INPUT screens.
12. Fix DIAGNOSTICS> FLOWS screen to start on line 8 instead of line 9.
13. Add INSTRUMENT CONTROLS> TIMEZONE screen.
14. Fix masking on DIAGNOSTICS menu for I/O expansion board.
15. Fix run screen status bar update when switching from RUN screen to MENU.
16. Fix CLINK command "set hg span conc" to validate and set span.
17. Modify floating-point and integer numeric entry screen routines to improve performance and handle big jumps.
18. Fix possible MODBUS data corruptions when handling multiple connections simultaneously.
19. Increase MODBUS response registers buffer length to ensure maximum data request will not overflow buffer.
20. Add software watchdog in low level processors to detect loss of communications.
21. Fix internal protocol handling in low-level processors to respond properly to single register requests.
22. Add error logging in /tmp/errorlog for debugging.
23. Remove possible "junk" output over serial port.