

Thermo Scientific
This update applies to all iSeries Model 146i
Firmware Version 03.00.01.313

*****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 146i 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 files, 146i030001.bin and 146i030001.cramfs, which can be used to update the model 146i 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:

"01.00.11.123"	"01.06.02.240"	"03.00.00.312"
"01.04.06.167"	"01.06.04.244"	
"01.05.00.187"	"02.00.00.292"	
"01.05.01.188"	"02.00.04.301"	
"01.05.13.202"	"02.02.00.306"	
"01.06.00.227"	"02.02.02.309"	

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 03.00.01 changes from version 03.00.00:

1. Fix "set gas X solenoid Y" and "gas X solenoid" commands to set and read correctly.

Version 03.00.00 changes from version 02.02.02:

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. Change gas setup menu "GAS SOL" item labels to "GAS INPUT".
9. Fix Modbus write coil error to respond with data error instead of address error if the wrong data is written to the coil.
10. 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.
11. Update "host name" CLINK command to respond with a <space> if no host name is found. If "set host name" data does not pass validation, respond with "data not valid" instead of "bad command".
12. Fix NTP lookup failure if host name not found.
13. Fix Modbus write coil error to respond with data error instead of address error if the wrong data is written to the coil.
14. Add MODBUS support for date and time correction

15. Fix "set program bootloader procboard" CLINK command so that it no longer causes iSeries+ units to hang
16. Improve permeation oven option logic
17. Fix CLINK "mb read registers" and "mb read coils" commands.
18. Improve CLINK protocol communication over serial port.

Version 02.02.02 changes relative to version 02.02.00:

1. Remove extraneous characters from end of "GAS D" string on GAS SETUP menu.
2. 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.
3. Fix string buffer issue in INSTRUMENT CONTROLS> COMMUNICATIONS> TCP/IP SETTINGS screens which prevented users from entering an IP address with three digits in all four fields.

Version 02.02.00 changes relative to version 02.00.04:

1. Fix possible erroneous failure alarm and shutdown of permeation oven option that was introduced in version 02.00.04.
2. Fix lrec and srec CLINK commands to respond with only line feed character after each record and carriage return and line feed after the last record to correct response processing in iPort's terminal window.
3. Fix softkey assignment screen to always show SAVING message for three seconds after the enter key is pressed.
4. Add support for new processor board revision 1.5T.

Version 02.00.04 changes relative to version 02.00.00:

1. Add Chinese language support in 146i. Remove user-defined soft keys when Chinese language selected.
2. Add SERVICE> LANGUAGE screen to switch between Chinese and English languages.
3. Add shortcut to SERVICE> LANGUAGE screen: Press RIGHT ARROW twice on the MAIN MENU, then press DOWN ARROW to select the language.
4. Fix manual gas span mode operation that was broken in 02.00.00.
5. Update LEADS protocol to report ozone concentrations as gas position as "O3" instead of "OZONE" and report in ppm.
6. Update LEADS protocol .22 command to respond with "INVALID COMMAND" on an attempt to start a program if one is already running.

Version 02.00.00 changes relative to version 01.06.04:

1. Add ambient temperature to output list
2. Add LEADS protocol support
3. Fix "gflow" CLINK command to show target flow instead of 2nd actual gflow
4. Program status command now shows a zero for the prog number if no program is active.
5. When a program is running show next event instead of next program on title bar
6. Fix gas name output to have leading spaces

7. Fix memory overrun when resetting new program info
8. Change event no limit from 32 to 31
9. Add [set] program X enable [on/off] CLINK command
10. Add clink PROGRAM_STATUS CLINK command
11. Add CLINK commands for perm oven setup "PERM K", "PERM RATE" and "PERM Lx CONC"
12. Change run screen title bar to show current program number
13. Add 8 additional user digital outputs for LEADS
14. Add 6th level to concentrations, ozonator, perm oven, and conc alarms
15. Nominal ozone concentrations now reported in gas conc position if no other gas is available
16. Add message to cycle power when changing NTP server IP address
17. Set alarm when communication with MIB is lost and clear it when it's re-established

Version 01.06.04 changes relative to version 01.06.02:

1. Fix possible lockup during analog input initialization if I/O expansion board installed.
2. Fix floating-point number entry screens to allocate the correct number of digits.
3. Fix INSTRUMENT CONTROLS> I/O CONFIGURATION> ANALOG INPUT> CHANNEL> UNITS screen to show SAVING correctly.
4. Fix INSTRUMENT CONTROLS> TIMEZONE screen so correct value is displayed when password locked.
5. Fix SERVICE> PERM OVEN SETTINGS screens to show "?" on SET TO: line.
6. Update concentration precisions in output list so ASCII LREC/SREC/EREC data is reported to 0.000001 ppm.
7. Increase precision of 'diag volts' CLINK commands.
8. Eliminate possible diagnostic output on serial port from datalogging functions.
9. Update real-time-clock driver to work with new hardware.

Version 01.06.02 changes relative to version 01.06.00:

1. Turn the ozonator lamp if drive set to zero
2. Fix analog output scaling issue
3. Allow 999 hours on PROGRAM > PERIOD HOURS screen
4. Fix precision values in output list and use them for printing logged data
5. Fix EXT ALARMS string length in output list
6. Fix stray characters on SERVICE> ZERO FLOW CALIBRATION and SERVICE> GAS FLOW CALIBRATION screens
7. Fix SERVICE> PERM OVEN SETTINGS> CAL GAS THERMISTOR> WATER BATH screen so the validation error messages are correct (they were high/low inverted)
8. Fix location of "?" when setting changed in SERVICE> LAMP SETTING screen
9. Fix location of "TFLOW:" on FLOW MODES> O3> GPT> LEVEL #> GAS N> ZERO/SPAN # screens
10. Fix display pixel test screen message to show RUN instead of RIGHT ARROW TO EXIT
11. Add "solenoid" CLINK command
12. Add ':' to end of title line on Permeation Oven Setup> Level # screens

13. Modify GAS SETUP> GAS X> TANC CONC screen to warn that value is too high and clamp to maximum but don't save
14. Fix level # display on final confirmation screen when selecting FLOW MODE> O3> PHOTOMETER CONTROL> MANUAL.