

Thermo Scientific
This update applies to all iSeries Model 48i
Firmware Version 03.00.01.309

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

iPort Software version 01.04.01 (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 Models 15i, 46i, 48i and 410i 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, 48i030001.bin and 48i030001.cramfs, which can be used to update the following models:

15i, 46i, 46iHL, 48i, 48iHL, 48iTLE, 410i, 48iJ, and 48iHLJ

iPort v01.04.01 or greater should be used to perform this software update, as these versions of iPort will automatically select the proper file for the update.

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:

"01.01.00.066"	"01.04.00.116"	"01.06.00.231"	"02.00.03.295"
"01.02.00.079"	"01.05.00.138"	"01.06.01.240"	"02.02.00.299"
"01.02.12.095"	"01.05.01.139"	"01.06.08.259"	"02.02.03.304"
"01.02.14.097"	"01.05.02.142"	"01.06.09.261"	"02.02.04.305"
"01.02.18.101"	"01.05.03.250"	"01.06.10.262"	"03.00.00.308"
"01.04.00.116"	"01.05.56.200"	"02.00.01.287"	

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. Dilution Ratio added to datalogging, streaming, and modbus. Modbus read register addresses for Dilution Ratio (dilrat): 48i/410i: 97 & 98

Version 03.00.00 changes from version 02.02.04:

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. Invert signs in time zone labels to match the actual functionality and change "GMT" to just "UTC".
5. 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).
6. Fix RS-485 user serial port communications.
7. Update logo on splash screen.
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. Improve CLINK protocol communication over serial port.

Version 02.02.04 changes relative to version 02.02.03:

1. Added ppb and ug/m3 units to all variants except 410's.

Version 02.02.03 changes relative to version 02.02.00:

1. Fix display of drift compensation for 410.

2. Added concentration calibration data to output list for MODBUS usage.
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.
5. Fix "set format", "set lrec format", "set srec format", and "set errec format" CLINK commands to save the new setting if the source of the command is serial.
6. Fixed "set program bootloader procboard" CLINK command so that it no longer causes iSeries+ units to hang.
7. 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".

Version 02.02.00 changes relative to version 02.00.03:

1. Fix motor speed alarm adjustments made in version 01.06.10 that were removed from 02.00.01 and 02.00.03.
2. Fix sample mode digital output so it's not active during purge mode.
3. Fix fullscale value for O2 corrected concentration analog outputs.
4. 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.
5. Fix version string in cramfs image used by iPort during a firmware update so iPort will report the file's version correctly.
6. Fix softkey assignment screen to always show SAVING message for three seconds after the enter key is pressed.
7. Fix alignment of range mode fields in SERVICE> RANGE MODE SELECT screen.
8. Add support for new processor board revision 1.5T.

Version 02.00.03 changes relative to version 02.00.01:

1. Fix version string reported by iPort Update Firmware function.
2. Add Chinese language support in 48i. Remove user-defined soft keys when Chinese language selected. Remove SERVICE> SETUP RUN SCREENS> EDIT RUN SCREEN> EDIT TITLE screen when Chinese language selected.
3. Add SERVICE> LANGUAGE screen to switch between Chinese and English languages.
4. Add shortcut to SERVICE> LANGUAGE screen: Press RIGHT ARROW twice on the MAIN MENU, then press DOWN ARROW to select the language.
5. Change high motor speed alarm from 100.1 to 100.5 as was the case in version 01.06.10 which was dropped in version 02.00.01.

Version 02.00.01 changes relative to version 01.06.10:

1. Add "o2 temp" CLINK command
2. Fix "coef o2" CLINK command
3. Remove alarm motor speed CLINK command

4. Fixed issue in Japan option units where date was not correctly updating when time sync signal received at midnight
5. Display O2 corrected concentrations in selected units on run screens
6. Add function to handle hourly avg reset time issues for Japan option
7. Fix ALARMS> ZERO/SPAN CHECK> MAX OFFSET to limit the value to 1/10th of the largest range in the proper units
8. Fix possible lockup during analog input initialization
9. Add 48iTLEJ support
10. Increase precision of 'diag volts' CLINK commands
11. Add o2 conc alarm min and max to digout list
12. Fix unit response in 'alarm agc intensity' CLINK commands
13. Fix DIAGNOSTICS> TEST ANALOG OUTPUTS to output the calibrated span value for Japan option units, was outputting full-scale value
14. Temp Comp tables for 46i-HL modified
15. Add message to cycle power when changing NTP server IP address
16. Set alarm when communication with MIB is lost and clear it when it's re-established

Version 01.06.10 changes relative to version 01.06.09:

1. Adjust high motor speed alarm from 100.1 to 100.5 percent.

Version 01.06.09 changes relative to version 01.06.08:

1. Fix analog output scaling for N2O in Model 46i.
2. Minor speed improvements to the CALIBRATION FACTORS menu.
3. Fix issue with cursor position updates on alphanumeric entry screens.
4. Fix possible (but highly unlikely) menu lockup.

Version 01.06.08 changes relative to version 01.06.01:

1. Add support for Model 46i.
2. Update min O2 span conc from 10.0 to 1.0 (percent).
3. Add O2 concentration alarm functionality.
4. Check for possible divide by zero error in O2 pressure compensation.
5. Eliminate occasional concentration spikes during auto zero/span valve switching.
6. Add list index validation on power-up.
7. Fix analog output scaling for later items in the output list.
8. Fix precision values in output list and use them for printing logged data.
9. Fix ALARMS> O2 CONCENTRATION> MIN/MAX screens so they work correctly as numeric edit screens.
10. Fix ALARMS> CONCENTRATION> MIN TRIGGER screen so it toggles the value correctly.
11. Fix prompts on SERVICE> O2 CORRECTION CONC screen.
12. Fix Japan option pressure span cal in service menu.
13. Modify floating-point and integer numeric entry screen routines to improve performance and handle big jumps.
14. Add screen to select which user-defined run screen is displayed on power-up.
15. Add support to display Boolean on/off, enable/disable and yes/no parameters on the user-defined run screens.

16. Fix possible MODBUS data corruptions when handling multiple connections simultaneously.
17. Increase MODBUS response registers buffer length to ensure maximum data request will not overflow buffer.
18. Add software watchdog in low level processors to detect loss of communications.
19. Fix internal protocol handling in low-level processors to respond properly to single register requests.
20. Add error logging in /tmp/errorlog for debugging.
21. Remove possible “junk” output over serial port.

Version 01.06.01 changes relative to version 01.06.00:

1. Auto zero and span checks and calibrations now allowed in all range modes and measurement modes. In dual and auto range modes, calibrations and checks are done using the low range span concentrations.
2. Add option to OR together status bits in flags (upper 16 bits) over the datalogging interval.
3. Fix to INSTRUMENT CONTROLS > DATA LOGGING SETTINGS > VIEW LOGGED DATA screen for the case when there's only 1 logged data record.
4. Make calibration and configuration file error detection more robust.