

SOLARTOUCH[®] CONTROLLER FIRMWARE UPGRADE KIT (P/N 521606)



INSTALLATION GUIDE

IMPORTANT SAFETY INSTRUCTIONS READ AND FOLLOW ALL INSTRUCTIONS SAVE THESE INSTRUCTIONS

Technical Support

Phone: (800) 831-7133

Web site: www.pentair.com

Kit contents

The following items are included in Kit P/N 521606

- PICKit[™] 4 programmer
- Installation Guide (this manual)

System requirements

• Windows[®] 10 and Windows 7

Related manual

SolarTouch® Controller Manual (P/N 521591)

Contents

2

SolarTouch[®] Controller Firmware Update Instructions

The SolarTouch Controller firmware can be updated using the PICkit[™] 4 in-circuit programmer which is connected to a USB port on a computer running Microsoft[®] Windows[®] operating system.

IMPORTANT: Do not plug in PROGRAMMER until after software is installed.

Note: Be sure that you have administration rights on your PC before starting the installation.

Note: Before starting, please read through the instructions (see pages 3-11).

Install MPLABX (version 5.25 or later) online using a PC or Laptop

Install the MPLABX[®] V5.25 Integrated Programming Environment IPE software onto your PC as follows:

- 1. Connect to the Internet using a PC or Laptop.
- 2. Navigate to Microchip MPLab web site to download IPE programming software: http://www.microchip.com/mplab/mplab-x-ide
- The IPE application must be installed on the PC which must be available during the MPLAB X IDE installation process, if a checked box is selected. You do not need to install the MPLAB X IDE in order to use the IPE application.
- 4. From your PC Downloads folder, double-click file **MPLABX-IDEwindows-installer.exe** to start the installation process.
- 5. Select **Yes** to downloaded the program from the Internet to make changes to your computer.
- 6. Click "Next" from Setup window. Select "I accept the agreement" then click Next.



Install MPLABX® (version 5.25) online using a PC or Laptop (Continued)

- 7. Select Use System Proxy Settings and click Next.
- 8. Select MPLAB IPE (Integrated Programming Environment) and all of the application selections. Click Next.

| U Setup - X | U Setup - X |
|---|---|
| Installation Options | Select Applications. |
| Configurable system preferences: accept the recommended default-values or casterniza for your installation. Installation Develop: Prevo: Settings Prevo: Settings Use System Prevo: Settings | Observe which application you used the install MPLALX CD (Integrated Development Environment) MPLALB PE (Integrated Programming Environment) Oncess Mixedual device appent you vert installed Integrated Development (Long) MPLALB PE (Integrated Programming Environment) Oncess Mixedual device appent you vert installed Integrated Development (Long) Meta MCN(r.0.208) Other MCDs (ERBALEL; HCSens) (2.1MB) Help Improve MPLAB X Fonducts Integrated Development and the production of four representents. - Dam annes and partnerses - Dam annes and partnerses - Mixed Mixed and Constances and partnerses - Mixed Mixed and Constances and partnerses anderses anderses and partnerses and partnerses and partn |
| interfluction K Back New Y. Cancel | The MPUAB team really appreciates your participation in helping improve our product? Installization |

Installation Options: Use the default Installation directory (or select 9. another directory. Select "Use System Proxy Settings" Click Next to install the software.

Follow the screen prompts.

10. Click Finish to complete the installation process. Continue the installation with Connecting the Programmer on next page.

| U Setup | - × × | () Setup | - 0 X |
|---|-------|--|-------|
| Ready to Install | | Installing | X101 |
| Satup is now ready to begin installing MPLAE X DE v5.25 on your computer. | | Peace with while Setup Installs MPLAB X DE v5.25 on your computer. Installing Install MPLAB Communications Unary | |
| | | | |
| tetelli din | | | |

4

Connecting the Programmer

Connect the USB cable (provided) to the programmer and to a USB

port on the PC. Note: If a USB hub is being used, the hub must be powered with its own power supply.



PICKit® 4 programmer

Connect Programmer to SolarTouch® Control Panel

- Open the front cover of the controller. Remove the three (3) screws securing the control panel. Flip the control panel up to access the control panel circuit board. Note: Be careful not to stretch the ribbon cable connecting the control panel to the main circuit board.
- 2. Locate the 5-pin header programming connector JP2 on the control panel circuit board. **Note where pin 1 is located.**



5-pin header programming connector

Pin 1

SolarTouch Control Panel Circuit Board

6 Connect Programmer to SolarTouch[®] Control Panel (Continued)

3. With the front (LEDs) of the PICKit[®] 4 programmer facing you, connect the programmer (pin 1 on right side) onto the 5-pin connector (pin 1 on right side) on the control panel circuit board (PCB) as shown below.



PICKit 4 programmer plugged into SolarTouch Controller circuit board.

4. Switch ON power to the SolarTouch Controller.

5. Next, load the MPLAB IDE software.

Continue with Launching the IPE Programming Application on the next page.

Launching The IPE Programming Application

1. After installing the software, double-click the MPLAB[®] IPE v5.25 application icon located on the desktop. The IPE main window opens.



2. From drop-down menu, select as follows:

Family: All Families

Device: PIC16F1939

Tool: PICkit4S. No: "Programmer Serial #"

- 3. Click **Connect to connect to Device and Tool** and make sure there is no Connection error in the Output window.
- 4. If a Caution screen displays, click **OK** to continue.

| 🯮 MP | LAB IPE X |
|----------|--|
| <u>^</u> | CAUTION: Check that the device selected in MPLAB IPE (PIC16F1939) is the same one that is physically attached to the debug tool. Selecting a 5V device when a 3.3V device is connected can result in damage to the device when the debugger checks the device ID. Do you wish to continue. NOTE: If you would like to program this device using low voltage programming, select Cancel on this dialog. |
| | Do not show this message again |

5. Upon connecting the following screen displays, indicating the PICKit[™] 4 Programmer is connecting to the target device.

Note: If the "Hex File" and "Browse" window does not show, you may need to minimize the "Output - IPE" window.



6. Select Erase. Be sure that erase device memory is complete.

| Operate | | | | (| 4.2 |
|--|--|--------------|---------|----------------|-------|
| Device and To | ool Selection | | Results | | |
| Family: | All Families | | Check | ksum: 3732 | 89 |
| Device: | PIC16F1939 | + e Apply | Pass C | ount: 4 | 1 |
| Tool: | PICkit 4 S.No : BUR185079551 | * Disconnect | Fail C | Count: 1 |] |
| Hex File: | Click on browse to select a hea file | | | Browse Cremen | CHON. |
| SUIP File: | Click on browse to select a SGLP file | | | Browne Cone on | Chan. |
| Connecting Currently Application Boot versi Script ver Script bui Target vol Target dev | LossELB SICkit 4 LossEded versions: n version n vorsion 0.0.0.14 stem 0.0.0.0.10 inumber basefiel175b tape detected is100 Id = 0x3 | | | | |
| Device Nev | | | | | |

SolarTouch Controller Firmware Update User's Guide

7. Select **Browse** to load firmware .hex file from the PC directory to be programmed into the device. Then click **Open**.

| Device and To | ol Selection | | | Results | | | |
|---|---|---|--|------------------------|---|---|------------------------------------|
| Family: | All Families | | • | c | hecksum: | 3732 | EB |
| Device: | PIC16F1939 | | - 😸 Acely | Pa | ss Count: | 4 | |
| Tool: | PICkit 4 S.No | BUR185079551 | * Disconnect | , i | ail Count: | 1 | |
| | roy and | -De Erase | Read | Verify | | Blank Check | K |
| Hex File: | Click on browse to | elect a tex file | T Read | Ger Verify | Br | Blank Check | HICOIRS |
| Hex File; SQTP File; utput - IPE | Click on browse to Click on browse to K | eelect a hex file select a SQTP file | T Read | Verify | Br | Blank Check | kitation ketator |
| Nex File: | Click on browne to Click on browne to K K NPLAB PICH- | eelect a hex file select a SQTP file Mex file selection | Read | C Verify | Br | Ellanik Check | k interview Anterview X |
| Hex File: SQTP File: Utput - IPE > Connecting Currently 1 Application | Click on browse to Click on browse to k so MPLAS PICk+ Loaded version o version | Entroise enfect a here file enfect a SQTP file Mex file selection T | Read | v o s | Bri Bri Bri | Elianit Check | x x x |
| Hex File: SQTP File: Utput - IPE Connecting Currently 1 Application Soct version Script version | Click on browse to Click on browse to Click on browse to so NPLAS PICES so NPLAS PICES so NPLAS PICES so NPLAS PICES | elect a hox file select a SQTP file Her file selection Corganize V Newf | Firmware > SolarTouch | v o s | Bri Bri Bri | Eliank Check | x x x x x x x |
| Hex File: SQTP File: utput - IPE > Connecting Currently 3 Application Sector version Sector version version Sector version ver | Click on browse to Click on browse to Click on browse to Click on browse to the MDLAB PICLA- to MDLAB PICLA- T | elect a hox file select a SQTP file Hex file selection (| Firmware - SolarTouch clider | verty v 0 5 | Bar Bar Bar Date m | South | к матала р 1 0 Туре |
| Hex File: SQTP File: utput - IPE > Connecting Currently 1 Application Boot versio Script version Script buil Target deut Target deut Deutce Keut | Click on browse to Click on browse to Click on browse to Click on browse to the MPLAS PICH- to MPLAS PICH- to MPLAS PICH- to MPLAS PICH- to MPLAS PICH- to MPLAS PICH- to MPLAS PICH- Status on Tal a source to MPLAS PICH- St | effect a free file effect a SQTP file Here file selection Organize + New file SQUECK access d | Firmware > SolarTouch cider Name | ✓ Verify ✓ (5) 5 A hex | Barch SolerT Date w | Fouch | р Туре НДХ Гае |
| Hex File: SGTP File: wtput-IPE 1 Connecting Currently 1 Application Book versio Sociaty very Sociaty very Sociaty very Sociaty very Device Revi Device Revi | Click on browse to Click on browse to e to MPLAS FICE- to MPLAS FICE- to MPLAS FICE- to Antional State to Antional State State to Antional State to Antional | creve exist a tex file exist a SQTP file defect a SQTP file def | Firmware > SolarTouch Name SolarTouch, V2,2 | ✓ Verdy ✓ 6 5 5 A bex | Bin Bin Bin Date w 2/21/2 1/25/2 | Blank Check ownn iwnin Souch BEI + []] nodified Oth High D18 H0,37 AM | × P Type HEX File |
| Hex File: SQTP File: SQTP File: Connecting Cursently : Application Social version Social version Socia | Click on browse to Click on browse to c to MPLAB PICA- loaded version b version d mather Lage detected Log PICLETISIS ision Id = Ox | Erree estect a tex file estect a tex file estect a SOTP file Met file selection | Firmware > SolurTouch clider SolurTouch, V.3.2 SolurTouch, V.3.2 | ✓ Verity ✓ 0 5 5 A bex | Bin Bin Date w 2/21/2 1/25/2 | © Blank Check ownn fouch Bl∃ ← [] hodffied 018 11:32 AM 018 10:37 AM | р Турт НЕХ Гле |
| Hex File: SQTP File: SQTP File: Connecting Currently 3 Application Secies version Secies version Sector version Secies version | Click on browne to Click on browne to Click on browne to N DELAS FICAN N OFFICATION N OFFICATION N OFFICATION AGE NUMBER AGE NUMBER | Erne ernernerne erne erne erne erne erne erner | Firmware > SolarTouch cider A Name SolarTouch, V2.3 SolarTouch, V2.2 | × 6 5 | Bin Bin Date w 2/21/3 1/29/2 | Ellanic Check owner Check wordt Baz + D hoddfied oris 11:32 AM oris 10:37 AM | P Type HEX File HEX File |

8. Be sure the hex file to be programmed is loaded successfully.

| perate | | | | | | | | 111 |
|---|--|-----------------------|--------------|------------|---------|------------------------|-------------------|--------|
| Device and To | ol Selection | | | | Results | | | |
| Family: | All Familie | : | • | | Ch | ecksum: | 214E | œ |
| Device: | PIC16F19 | 39 | - 0 | ADDV | Pasi | Count: | 2 | 3 |
| Tool: | PICkit 4 S. | No : BUR 185079551 | | Disconnect | Tota | il Count: al Count: | 3 | 3 |
| ex File: | rogram C:/PROJECTS/FI | Erase | Touch_V2.3.h | Read | Venty | | Blank Check | ection |
| SQTP File: | Click on browse | to select a SQTP file | | | | Br | Dette Clear úit | |
| utput - IPE | * | | | | | | | |
| Connecting Currently Applicatio Boot versi Script ver | se MPLAE PIC leaded versio n version en. sien tage desersed | kis 4 ns: | | | | | | |
| Target vol | Les PICISFIN3 | 5 found. | | | | | | |

9. Select **Program** to program the device. Be sure that programming is complete.



10. Select Read to read the all memory.

| due and | | () |
|---|--|---------------------------------|
| Device and | Tool Selection | Results |
| Family: | All Families + | Checksum: 254E |
| Device: | PIC16F1939 - Acoly | Pass Count: 4 |
| Tool: | PICkit 4 S.No.: BUR185079551 * Disconnect | Feil Count: 1 Total Count: 5 |
| <u>.</u> | Program 🖳 Erase 🖳 Read | 🖳 Verity 🖳 Blank Check |
| Hex File: | CIPROJECTS/Firmware/SolarTouch/Solar_Touch_V2.3.bex | Browce Clear selection |
| SQTP File: | Click on browse to select a SQTP file | Browne Oran arternas |
| atout - IPF | 4 | |
| program # | emory: start address = 0x0, end address = 0x3fff | |
| program m configura E2Data me User Id M Reed comp | emergy - Using Address = 0x0, and Address = 0x3888 MOSY Address Address Late | |
| program m configure EEData me User Id H Read comp program, m configure EEData me User Id H Read comp | <pre>emergy toxet address = 0x0, and address = 0x3665 Morry Morry Late using memory area (s) will be read; memory toxet address = 0x0, and address = 0x3665 Midd memory Midd memory Amory Late</pre> | |

SolarTouch Controller Firmware Update User's Guide

11. Select **Verify** to verify the all memory. Once verified, "Verifcation Successful" is displayed.



- 12. Exit the IPE V5.25 application.
- Disconnect the PICKit[™] 4 programmer from the SolarTouch[®] Controller board.
- 14. The updated firmware should already be running. Reinstall the SolarTouch controller board in the enclosure and secure the control panel with the three (3) screws.
- 15. To verify the new firmware version, reset or re-cycle power on the SolarTouch Controller. The firmware version is only displayed immediately after reset for a few seconds





1620 HAWKINS AVE., SANFORD, NC 27330 • (919) 566-8000 10951 WEST LOS ANGELES AVE., MOORPARK, CA 93021 • (805) 553-5000

WWW.PENTAIR.COM

All Pentair trademarks and logos are owned by Pentair. SolarTouch® is a trademarks and/or registered trademarks of Pentair Water Pool and Spa, Inc. and/or its affiliated companies in the United States and/ or other countries. PICkit™ and MPLAB® are trademarks and/or registered trademarks of Microchip Technology Inc. Microsoft® and Windows® are registered trademarks of Microsoft Corporation in the United States and other countries. Because we are continuously improving our products and services, Pentair reserves the right to change specifications without prior notice. Pentair is an equal opportunity employer.

© 2019 Pentair Water Pool and Spa, Inc. All rights reserved. This document is subject to change without notice.



P/N 521609 - Rev C 9/2019