Softlog Systems (2006) Ltd.

# ICP Family Programmers

# User's Manual


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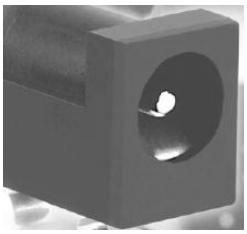
# 1 Connectors

### *1.1 "Power" Connector (Power Jack, Center Pin 2.1mm)*



| *Pin No.* | *Pin Name (ICP2-GANG)* | *Pin Name (ICP2, ICP2(HC), ICP2-Portable)* | *Voltage Range* |
|---|---|---|---|
| 1/center | POWER (+) | POWER (+/-) | 12V to 15V (9V to 15V for ICP2-Portable) |
| 2 | POWER (-) | POWER (+/-) | |

### *1.2 "USB" Connector (Type-B Female)*

### *1.3 "RS-232 IN" Connector (D-type 9 Female)*

Note: not available on ICP2-Portable

| *Pin No.* | *Pin Name* | *Voltage Range* | *Pin Type* | *Description* |
|---|---|---|---|---|
| 1 | - | - | - | Not connected |
| 2 | PC_RXD | RS-232 level | RS-232 output | TxD output to PC |
| 3 | PC_TXD | RS-232 level | RS-232 input | RxD input from PC |
| 4 | PC_DTR | -15V to +15V | Power | **ICP2-GANG**: Not connected<br>**ICP2/ICP2(HC)**: Additional power supply input |
| 5 | GND | - | GND | Ground connection |
| 6 | 12V_OUT | 11-14VDC | Power | **ICP2-GANG**: power supply output<br>**ICP2/ICP2(HC)**: Not connected |
| 7,8,9 | - | - | - | Not connected |

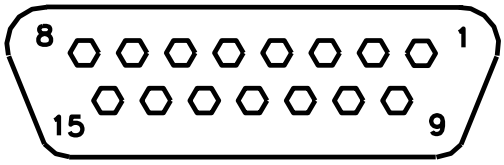
### *1.4 "RS-232 OUT" Connector (D-type 9 Male)*

Note: available on ICP2-GANG only

| *Pin No.* | *Pin Name* | *Voltage Range* | *Pin Type* | *Description* |
|---|---|---|---|---|
| 1 | - | - | - | Not connected |
| 2 | CHAIN_232_RXD | RS-232 level | RS-232 input | RxD input from next ICP2-GANG |
| 3 | CHAIN_232_TXD | RS-232 level | RS-232 output | TxD output to next ICP2-GANG |
| 4 | - | - | - | Not connected |
| 5 | GND | - | GND | Ground connection |
| 6,7,8,9 | - | - | - | Not connected |

### *1.5 "TARGET" Connector (D-type 15 Female)*

Note: ICP2-GANG - 4 Identical Channels
ICP2/ICP2(HC)/ICP2-Portable - 1 channel




| *Pin No.* | *Pin Name* | *Voltage Range* | *Pin Type* | *Description* |
|---|---|---|---|---|
| 1 | T_VDD | 2.0V to 5.5V | Output or input with weak pull-down and programmable strong pull-down | Target VDD supply voltage |
| 2 | GND | - | - | Ground connection |
| 3 | T_SCK | 2.0V to 5.5V | CMOS output or input with weak pull-down | Target clock |
| 4 | T_MOSI | 2.0V to 5.5V | CMOS output or input with weak pull-down | Target data |
| 5 | T_MISO | 2.0V to 5.5V | CMOS output or input with weak pull-down | Target data, internally connected to T_MOSI |
| 6 | T_VPP | 2.0V to 13.5V | Output or input with weak pull-down | Target VPP supply voltage |
| 7 | T_TARG **(2)** | 5.0V | CMOS output | Optional general purpose output |
| 8 | T_VTEST | 2.0V to 13.5V | Output | Target VTEST signal for PIC17Cxxx family |
| 9 | T_DIO_0 | 2.0V to 5.5V | CMOS output or input with weak pull-down | Target VPP output for LVP or FOSC signal for PIC17Cxxx family |
| 10 | T_DIO_1 | 2.0V to 5.5V | CMOS output or input with weak pull-down | Target PGM output for LVP |
| 11 | GND | - | - | Optional ground connection |
| 12 | GND **(1)** | - | - | Optional ground connection |
| 13 | GO **(1)** | 0-1.0V or N/C | CMOS input with pull-up 10K | Input for programming activation in standalone mode |
| 14 | PASS_OUT**(1)** | 5.0V | CMOS output | Output for pass/fail/busy indication |
| 15 | FAIL_OUT **(1)** | 5.0V | CMOS output | Output for pass/fail/busy indication |

Notes:
(1) Dedicated for standalone operation without PC
(2) Not available on ICP2-Portable

### *1.6 Typical Connection to "TARGET" Connector*

| *Pin No.* | *Pin Name* | *Standard (5-pin) Programming PIC10/12/16/18/24 dsPIC®/PIC32* | *LVP (6-pin) Programming PIC10/12/16/18* | *PIC17* | *I2C* | *Keeloq®* |
|---|---|---|---|---|---|---|
| 1 | T_VDD | VDD | VDD | VDD | VDD | VDD |
| 2 | GND | GND | GND | GND | GND | GND |
| 3 | T_SCK | CLOCK (PGC) | CLOCK (PGC) | CLOCK (PGC) | SCL | CLOCK |
| 4 | T_MOSI | DATA (PGD) | DATA (PGD) | DATA (PGD) | SDA | DATA |
| 5 | T_MISO | - | - | - | - | - |
| 6 | T_VPP | VPP | VPP | VPP | - | - |
| 7 | T_TARG | - | - | - | - | - |
| 8 | T_VTEST | - | - | VTEST | - | - |
| 9 | T_DIO_0 | - | - | FOSC | - | - |
| 10 | T_DIO_1 | - | PGM | - | - | S1 |

# 2 PC-Driven and Standalone Modes

ICP family programmers can be operated in PC-driven and/or standalone mode

| *Programmer* | *PC-Driven* | *Standalone* |
|---|---|---|
| ICP2/ICP2(HC) | Yes | Yes |
| ICP2-GANG | Yes (single channel only) | Yes |
| ICP2-Portable | Yes | Yes |
| ICP-01 | Yes | No |

***PC-driven*** mode means that all programming parameters and data are set in **PC** and the PC executes required sequences (programming, verification, blank check, etc)

***Standalone*** mode means that all programming parameters and HEX file data ("Environment") are saved in **programmer's** non-volatile flash memory. See paragraph 12 "Preparing Environment and Transferring Environment to Programmer".

Standalone programming can be activated by 2 ways:
- from PC
- by GO input on the programmer unit (NOTE: optional on ICP2-Portable)

Simultaneous multi-channel programming can be done in standalone mode only

# 3 PASS/FAIL LEDs and Outputs

| ### | *Conditions* | *PASS LED* | *FAIL LED* | *PASS Output* | *FAIL Output* |
|---|---|---|---|---|---|
| 1. | Power-up | 2 sec ON | | 2 sec ON | |
| 2. | Operation in-progress (busy) | ON | | ON | |
| 3. | Programming done: **PASS** | ON | OFF | ON | OFF |
| 4. | Programming done: **FAIL** (verification error) | OFF | ON | OFF | ON |
| 5. | UUT problem during operation:<br>- Vdd overload<br>- Vpp overload<br>- I2C communication error | OFF | Blink | OFF | ON |
| 6. | Non-UUT problem during standalone operation:<br>- database error<br>- device not supported<br>- no Keeloq® support<br>- no dsPIC® support<br>- etc. | OFF | Blink | OFF | OFF |
| 7. | No firmware presents (bootloader only) | Slow blink | OFF | OFF (not supported) | |
| 8. | Firmware upgrade in-progress | Fast blink | OFF | OFF (not supported) | |

# 4 Other LEDs (ICP2-Portable)

See ***"ICP2-Portable Quick Start.pdf"***

# 5 Standalone Operation without PC

- Prepare an environment and transfer to programmer – see paragraph 12 for details
  NOTE: once the environment is saved in **non-volatile** memory it's automatically ready for programming
- Short pin GO (:13) of the target connector to GND (:12) for at least 100ms to start programming
- Observe PASS/FAIL LEDs or/and pins PASS (:14) and FAIL(:15) – see paragraph 3 for details

# 6 Host Computer Requirements

- Pentium-4 or greater IBM PC compatible
- Resolution 1024x768 or higher
- 64MBytes of RAM
- Windows-XP/Vista/7. Contact Softlog Systems for operation with Win-95/98/NT/2000
- At least 50MBytes of hard disk space
- CD-ROM drive
- Free RS-232 or USB port

# 7 Installation

## *7.1 Preliminary Installation*

### 7.1.1 Software Installation

To install the software supplied, follow the steps below:

- Insert ICP family CD in the CD-ROM drive. An opening screen appears
- Click "Install ICP for Windows" and follow the on-screen instructions

If the opening screen does not appear:
- Double-click on the "My Computer" icon
- Double-click the icon for your CD-ROM drive
- Double-click "IcpSetupWithDll.exe"

#### 7.1.2 Preliminary Hardware Installation

- Connect the programmer to its power supply (not required for ICP2-Portable)
- Connect RS-232 or USB cable between PC and the programmer
- Install USB driver according to ***"ICP2 USB Driver Installation"*** manual
  NOTE: USB driver installation is not required for operation with RS-232 port

### *7.2 ICP2-GANG Setup*

- Install ICP2-GANG according to ***"ICP2-GANG Quick Start"*** manual

### *7.3 ICP2-Portable Setup*

- Install ICP2-Portable according to ***"ICP2-Portable Quick Start"*** manual

### *7.4 ICP2/ICP2(HC) Software Setup*

#### 7.4.1 Run "ICP_Win.exe" Program

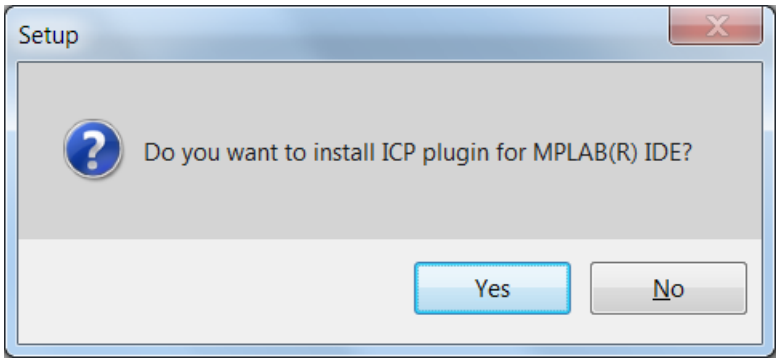
- Double-click "ICP_Win" icon
- Press "Yes" if message "Newer firmware is available. Upgrade now?" appears

#### 7.4.2 Run "Programmer/Quick Start Wizard" and follow the Wizard

## 8 Plug-in to MPLAB® IDE

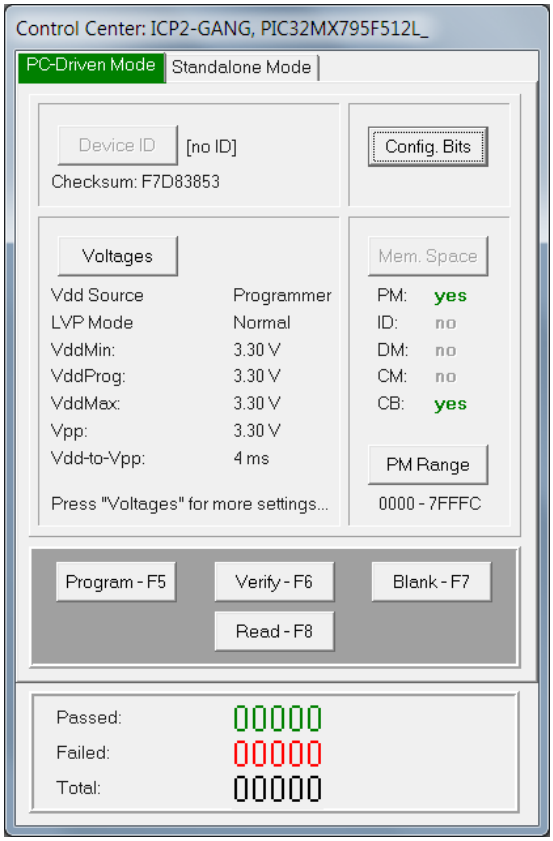
- ICP2-GANG and ICP2/ICP2(HC) programmers are integrated into Microchip MPLAB® IDE.

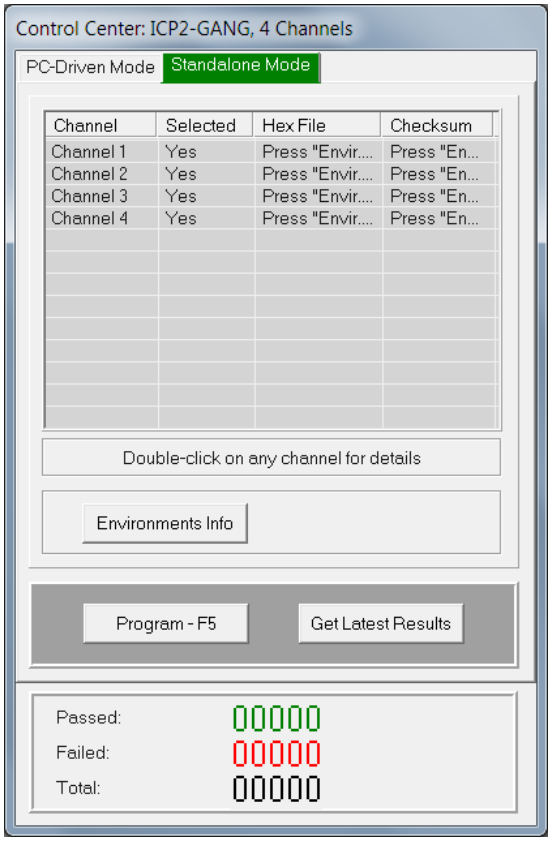
  Press "Yes" during software installation after the following message appears "Do you want to install ICP Plug-in for MPLAB?"



# 9 Control Center

Control Center has 2 operation modes: PC-driven and Standalone




## *9.1 Control Center in PC-Driven Mode*

Control Center in PC-driven mode allows the following operations:

- Edit device ID
- Edit configuration bits of the device
- Select memory space
- Set PM range
- Programming, Verification, Blank Check and Read

## *9.2 Control Center in Standalone Mode*

Control Center in standalone mode allows the following operations:

- Get environment information for all channels (button Environment Info)
- View environment details of selected channel (double-click on selected channel)
- Programming
- Get latest results

# 10 Menu Commands

## *10.1 File Menu (Alt-F)*

| | |
|---|---|
| Open (Import)... | Open a HEX file from disk and load it into buffer memory area |
| Save | Save the currently loaded file |
| Save As (Export)... | Save the buffer to a HEX file on disk |

| | |
|---|---|
| Save Configuration | Save all current settings |
| Exit | Exit the software |

### *10.2 Edit Menu (Alt-E)*

| | |
|---|---|
| Edit/Fill Program Memory | Fill an area of the Program Memory with a specified value |
| Edit/Fill Data Memory | Fill an area of the Data Memory (EEPROM) with a specified value |
| Read-only Editors | Enable/disable edit of Program and Data Memory buffers |

### *10.3 Environment (Alt-P)*

| | |
|---|---|
| Save Environment As… | Save current setup and buffers in environment format (*.pj2) |
| Transfer Environment to Programmer… | Transfer Environment (*.pj2) to programmer |
| Environment Wizard… | |

### *10.4 Serialization Menu (Alt-S)*

| | |
|---|---|
| Disable | Disable serialization |
| Load File | Load serialization file |
| Create File | Create serialization file |

### *10.5 Device Menu (Alt-D)*

Select a type of device to be programmed

### *10.6 Programmer Menu (Alt-G)*

| | |
|---|---|
| Select Programmer | Select programmer (ICP2/ICP2(HC) or ICP2-GANG) |
| GANG Configuration | Select active GANG channels (64 max) |
| Assign Address to GANG Box | Assign address to currently connected programmer (1-16). See ***"ICP2-GANG Quick Start"*** for details |
| Quick Start Wizard | |

### *10.7 Run Menu (Alt-R)*

| | |
|---|---|
| Program | PC-driven mode: program data in the buffer(s) into the device<br>Standalone mode: activate standalone programming |
| Verify | Verify the data in the device against the data in the buffer(s) |
| Blank Check | Check the data in the device for the blank state |
| Read | Read the device and store the data in the buffers |
| Program Only | Open a window for repeated programming |

### *10.8 Communication Menu (Alt-C)*

| | |
|---|---|
| RS-232/USB/Bluetooth COM | Select the desired COM port |
| Connect | Connect to the programmer |

### *10.9 Options Menu (Alt-O)*

| | |
|---|---|
| Voltage | Set desired voltages |
| Clock/Data/MCLR(Advanced) | Set desired Clock/Data/MCLR parameters |
| Preferences | Select options for programming |
| Firmware Upgrade | Execute firmware upgrade |
| Activation of Options | Execute activation of optional components:<br>- DLL/Command Line Support (D)<br>- dsPIC®/PIC24 Support (P)<br>- Keeloq® Support (K)<br>- Secure Programming Support (S)<br>- PIC32 Support (X)<br>Note: **Contact Softlog Systems for activation details** |

### *10.10 Help Menu (Alt-H)*

| | |
|---|---|
| Read me | Display "Readme_w.txt" file |
| About | Connect with the programmer and display software and firmware versions |

# 11 Shortcuts

| | |
|---|---|
| Save | Ctrl-S |
| Open... | Ctrl-O |
| Program | F5 |
| Verify | F6 |
| Blank Check | F7 |
| Read | F8 |
| Programming Only | F9 |
| Menu | F10 |
| Close Window | Ctrl-F4 |
| Exit | Alt-F4 |

# 12 Preparing Environment and Transferring Environment to Programmer

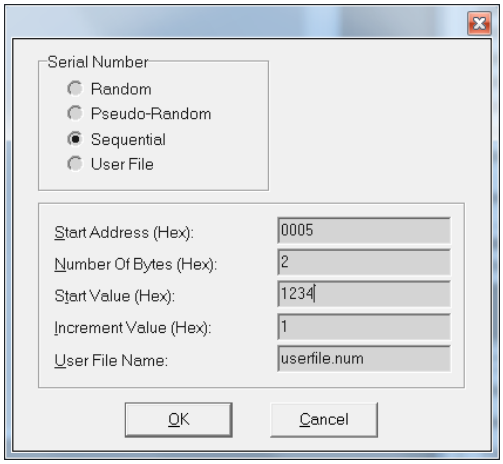
- Run "Environment/Environment Wizard" and follow the Wizard
- Select programmer and press "Next"
- ICP2-GANG only: select GANG channels and press "Next"
  ICP2-Portable only: select environment number and press "Next"
- Select Device
  From the "Device" list select a device to be programmed and press "Next"
- Set Voltages and press "Next"
- Load (open) a HEX file.
  NOTE: The programmer software is able to read ID information, data memory (EEPROM) contents and configuration bits from the HEX file
- Save Environment
  - Press on "…" button
  - Type in environment name, 16 characters max
  - Press "Save"
  - Press "Next"
- Transfer Environment to Programmer
  - Press on "Transfer Environment" button, select your environment and press "Open"
  - Wait until environment is transferred to all channels
  - Press "Next"
- Switch to Standalone Mode
  - Press on "Standalone Mode" button
  - Press "Finish"
- Your system is ready for standalone programming

# 13 Serialization

### *13.1 Create Serialization File*

- Select "Serialization/Create File" to generate a serialization file

- Enter the following data:
  - Serial Number (serialization scheme): random, pseudo-random, sequential and user file
  - Start Address. The address should be valid for the device
  - Number of Words. Enter the number of words (1 to 8) for your serial number.
  - Start Value. Enter the start value (1 to 16 hex digits). If the start value is greater than the maximum value for the number of words selected the most significant digits will be truncated. The start value must differ from zero for pseudo-random scheme.
  - Increment Value. Valid for the sequential scheme only
  - User File Name. Valid for "user file" scheme only




- Press OK to save a serialization file

NOTES:
- A currently selected serialization file will be updated after any successful programming for single-channel programming and after any programming attempt for ICP2-GANG
- The "retlw" opcode will be automatically generated for a selected type of devices, i.e.:
  - 08(Hex) for low-end microcontrollers (12C5xx, etc)
  - 34(Hex) for mid-range microcontrollers (16C/Fxxx)
  - b6(Hex) for high-end microcontrollers (17C7xx)
  - 0c(Hex) for enhanced microcontrollers (18Fxxx)
  - 054(Hex) for 16-bit devices (pattern: 0000_0101_0100_kkkk_kkkk_dddd)
  - no retlw is generated for PIC32

### *13.2 Serialization File Example 1*

SerializationScheme = 2 (0-Random, 1-Pseudo-Random, 2-Sequential, 3-User File)
StartAddress = 0005 (Hex)
NumberOfWords = 2 (Hex)
CurrentValue = 0000000000001234 (Hex)
IncrementValue = 1 (Hex)
UserFile = userfile.num

The following program memory locations will be updated as follows:

- PIC16xxx
  0005: 3434
  0006: 3412

- PIC12C5xx
  0005: 0834
  0006: 0812

### *13.3 Serialization File Example 2 (User File Scheme)*

SerializationScheme = 3 (0-Random, 1-Pseudo-Random, 2-Sequential, 3-User File)
StartAddress = 0005 (Hex)
NumberOfWords = 2 (Hex)
CurrentValue = 0000000000001234 (Hex)
IncrementValue = 1 (Hex)
UserFile = File1.num

User file should contain serial numbers in HEX radix, for example:
1111
2222
3333
4444
5FC1

The user file will be updated by placing semicolon (;) at very beginning of the string, for example:
; 1111
; 2222
3333
4444
5FC1

If your numbers start from very beginning of the string the 1-st digit will be replaced by semicolon:
;111
;222
3333
4444
5FC1

### *13.4 Enable Serialization*

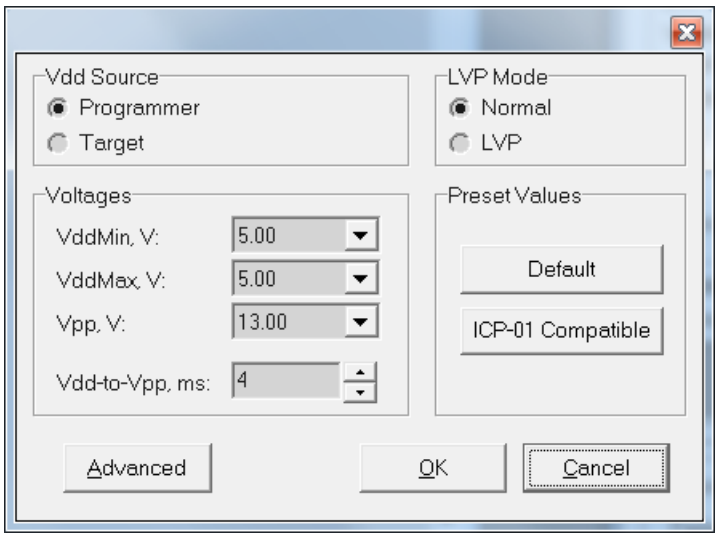
Select "Serialization/Load File" to activate serialization

### *13.5 Disable Serialization*

The serialization will be disabled in the following cases:
- "File/Open..." command is executed
- "Serialization/Disable" command is executed
- "Edit/Read-only Editors" is set to edit mode
- "Run/Read" command is executed
- a new device is selected
- user's serialization file is empty
- Control Center switches between PC-driven and standalone modes

# 14 Voltages

### *14.1 Menu: Options → Voltage*




### *14.2 Vdd Source and LVP Mode*

The programmer executes operations at the following Vdd voltages

| ### | ***Vdd Source*** | ***LVP Mode*** | ***Vdd during Programming*** | ***Vdd during Verify*** | ***Vdd during Blank Check*** | ***Vdd during Read*** |
|---|---|---|---|---|---|---|
| 1. | Programmer | Normal | Database | VddMin, VddMax ***(Note 2)*** | VddMin | Database |
| 2. | Programmer | LVP | VddMax ***(Note 1)*** | VddMax | VddMax | VddMax |
| 3. | Target | Normal | Target | Target | Target | Target |

Notes:
1) Use LVP mode if you want to change default programming voltage
2) Set VddMin=VddMax to disable the 2-nd verification pass

### *14.3 Vpp Voltage*

The Vpp voltage is the same for all the operations

### *14.4 Vdd-to-Vpp Delay*

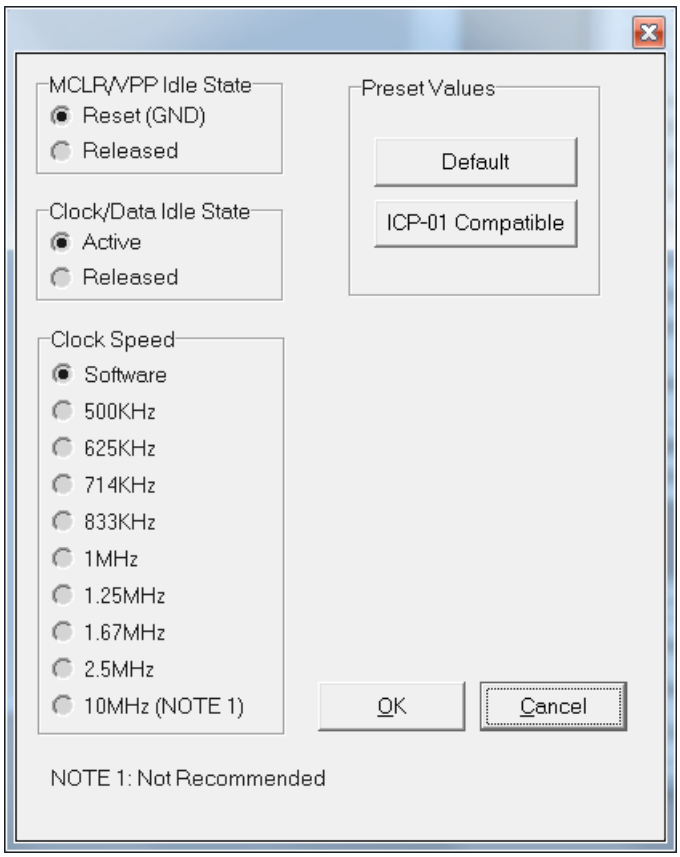
Delay between Vdd and Vpp can be in range 0.1...250ms. It is recommended to use default delay of 4ms to correctly enter the programming mode. Longer delays may be useful if the Vdd line has high capacitance (more than 200uF) which causes the Vdd to rise slowly

### *14.5 ICP-01 Compatibility*

Press on "ICP-01 compatible" button forces the following settings:
- Vdd Source: Programmer
- LVP Mode: Normal
- Voltages: Database values

# 15 Clock, Data and MCLR/VPP

### *15.1 Menu: Options → Clock/Data/MCLR(Advanced)*




### *15.2 MCLR/VPP Idle State*

Reset (GND): Programmer permanently keeps MCLR in reset state (GND) when no operation
Released: Programmer releases MCLR with weak pull-down of about 160KΩ

### *15.3 Clock/Data Idle State*

Active: Programmer configures data/clock pins as outputs when no operation
Released: Programmer releases data/clock with weak pull-downs of about 300KΩ

### *15.4 Clock Speed*

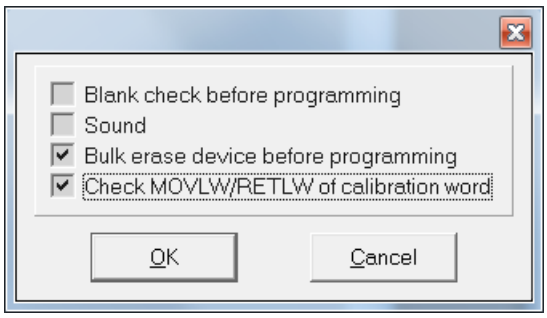
Clock speed can be selected for enhanced microcontrollers (PIC18F) and 16-bit devices (PIC24, dsPIC30 and dsPIC33). It's recommended to use high clock speed (2.5MHz) for devices with memory size bigger than 32K and dsPICs. **NOTE:** 10MHz is not recommended

### *15.5 ICP-01 Compatibility*

Press on "ICP-01 compatible" button forces the following settings:
- MCLR/VPP Idle State: Reset (GND)
- Clock/Data Idle State: Active
- Clock Speed: Software (100-500KHz, depends on device family)

# 16 Preferences

### *16.1 Menu: Options → Preferences*




### *16.2 Blank check before programming [ ]*

Enables/disables blank check operation before device programming. This option is not useful for flash devices

### *16.3 Bulk erase device before programming [x]*

When the option is ON the device will be automatically erased by bulk erase mechanism

**IMPORTANT:**
- this option must be set to ON for proper operation with most of devices
- it's the only option to erase code protected device

### *16.4 Row erase device before programming [ ]*

When the option is ON the device will be automatically erased by the row erase mechanism

**IMPORTANT:**
- row erase can't erase a code protected device
- available for dsPIC30 family only, may be useful for operation at low voltages

### *16.5 Exclude DM (EEPROM) from row erase [ ]*

When the option is ON the DM (EEPROM) is excluded from row erase procedure

NOTE: available for dsPIC30 family only, may be useful to preserve EEPROM

### *16.6 Check MOVLW/RETLW of calibration word [ ]*

When the option is ON an opcode of the calibration memory is tested during programming

NOTE: available for devices which have a calibration word with movlw/retlw opcode (PIC12F519, PIC12F675, etc.)

# 17 Configuration File

The ICP setup is saved in a configuration file named "icp01.cfg".

**IMPORTANT:** the program reads a configuration file that is located in a directory which specified in "Start in" property. This approach allows creation of unlimited configurations on the same PC

Normally, a configuration file should **not** be modified by a text editor.

# 18 Command Line Parameters (GUI)

Some parameters can be loaded from the command line:

<Hex file> - hex file to be loaded

/c<Configuration file> - configuration file to be loaded, overwrites local "icp01.cfg"
/s<Serialization file> - serialization file to be loaded
/p - production mode (one-touch operation)

Examples:

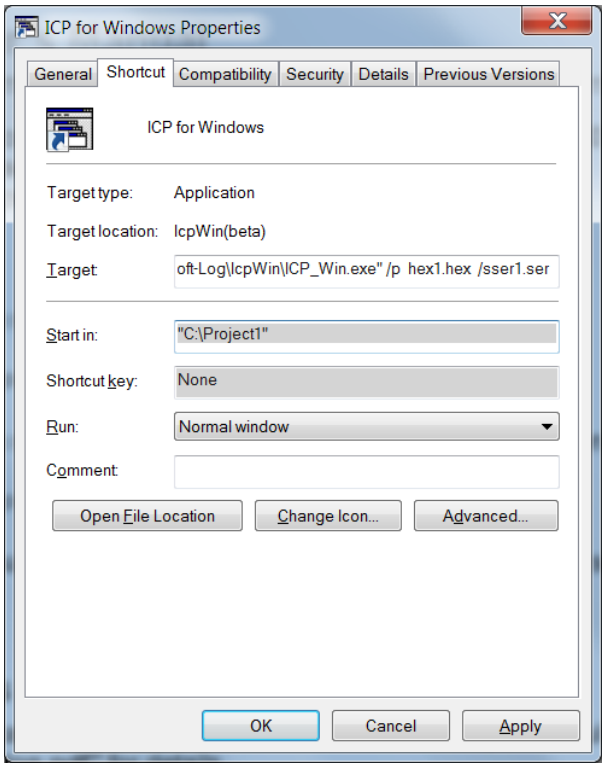
- Start in the production mode and load file "hex1.hex":

  <path to ICP_Win.exe> /p hex1.hex

- Start in the production mode and load hex file "hex1.hex" and serialization file "ser1.ser":

  <path to ICP_Win.exe> /p hex1.hex /sser1.ser

  "Start in" property should specify a directory where "hex1.hex" and "ser1.ser" are located




## 19 DLL Functions

ICP family programmers can be run from the user's application using powerful set of DLL functions. See document ***"DLL Description.pdf"*** for details

## 20 Command Line Interface (non-GUI)

ICP family programmers can be run from the user's application using full-featured command line interface. See document ***"ICP Command Line.pdf"*** for details

## 21 Secure Programming

Your hex files contain business-critical intellectual property that could be compromised during the contract manufacturing process. Utilizing patent pending technology, our Secure Programming feature provides several layers of protection that dramatically reduce the risk of unauthorized reconstruction of hex data. See document ***"Secure Programming Utility User's Manual.PDF"*** for more details

# 22 Manual Production Mode (One-Touch Operation)

The production mode is a powerful option for volume programming

The following steps should be done to correctly prepare the software for programming in the production mode:

- Create a subdirectory (C:\FILE_HEX)
- Copy your CFG, HEX and SERIALIZATION files to FILE_HEX subdirectory (for example: "hex1.hex" and "ser1.ser")
  NOTE: serialization file is optional
- Change ICP_Win shortcut property "Start in" to C:\FILE_HEX
- Change ICP_Win shortcut property "Target" to C:\...\ICP_Win.exe hex1.hex /sser1.ser /p
- Double-click ICP_Win icon for programming

The program will be terminated in the following cases:
- Communication error
- Hex file error
- Serialization file should be loaded (/s appears) but loading is failed

# 23 In-Circuit Programming

Standard in-circuit programming is done through 5 wires (VDD, GND, CLOCK, DATA and VPP)

### *23.1 Vdd*

- Maximum Vdd current consumption by the application circuit :
  - ICP2/ICP2-GANG: 250mA
  - ICP2(HC): 1000mA
  - ICP2-Portable: 50mA

- Maximum Vdd capacitance: 1000-10000uF. For ICP2/ICP2-GANG, increase Vdd-to-Vpp delay by about 20ms for every 1000uF

NOTE: If your circuit has low current consumption (less than 10mA) in conjunction with high capacitance (more than 100uF), the load resistor (100-510 Ohm) must be connected between Vdd and GND pins of the programmer for faster discharge of Vdd capacitor

### *23.2 Vpp*

Vpp recommended load (ICP2/ICP2GANG/ICP2-Portable): > 1KOhm, < 33nF
Vpp recommended load (ICP2(HC)): > 100 Ohm, <100nF

### *23.3 CLOCK and DATA*

CLOCK and DATA recommended load(ICP2/ICP2GANG/ICP2-Portable): > 3.3KOhm, < 33pF
CLOCK and DATA recommended load(ICP2(HC)): > 50 Ohm, < TBD nF

### *23.4 Delay between Vdd and Vpp*

This delay should be as short as possible (4ms is recommended)

NOTE: for more details contact Softlog Systems to obtain ***"ICP2-GANG Specification"***, ***"ICP2 Specification", "ICP2(HC) Specification" and "ICP2-Portable Specification"***

# 24 Appendix A: Power Supply

The ICP system (excluding ICP2-Portable) is shipped with its own power supply. If the user wishes to connect his/her own power, make sure the following specifications are met:

| *Programmer* | *Output Voltage* | *Output Current* | *Center Terminal, 2.1mm* |
|---|---|---|---|
| ICP2-GANG | 12VDC | 1.5A | "+" |
| ICP2 | 12VDC | 0.5A | "-" or "+" |
| ICP2(HC) | 12VDC | 1.5A | "-" or "+" |
| ICP2-Portable | 9-15VDC | 0.5A | "-" or "+" |

# 25 Technical Assistance

You may contact Softlog Systems for technical assistance by calling, sending a fax or e-mail. To help us give you quick and accurate assistance, please provide the following information:

- Software version number, firmware version number and product serial number (if available). This information is displayed at the program start
- Detailed description of the problem you are experiencing
- Error messages (if any)
- Microcontroller part number (if device-related)
- Send us your "icp01.cfg" file

# 26 Warranty

Softlog Systems (2006) Ltd. warrants this product against defects in materials and workmanship for a period of 1 (one) year. This warranty will not cover programmers that, in the opinion of Softlog Systems, have been damaged due to abuse, improper use, disassembly, replacement of parts or attempted repair by anyone other than an authorized Softlog Systems service technician.

This product must be returned to the supplier for warranty service within the stated period. The buyer shall pay all shipping costs and other charges or assessments for the product by the supplier.

Softlog Systems shall not be liable for any indirect, incidental, or consequential damages, regardless of whether liability is based upon breach of warranty, negligence, strict liability in tort, or any other theory, Softlog Systems will never be liable in an amount greater than the purchase price of the products described by this express warranty. No agent, distributor, salesperson, or wholesale or retail dealer has the authority to bind Softlog Systems to any other affirmation, representation, or warranty concerning these goods.

# 27 Contact

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