ICEPIC3

MODULAR, REAL TIME EMULATOR SYSTEM FOR

PIC18, PIC16, PIC12 Series

- High Performance Real Time Emulator

- Operates within MPLAB

- Hardware support for single steps in "C" (or any high level language) compiler (patent pending)

- Microchip Assembler & C Compatible

- Source level debug in Assembler or "C".

- TRACE Module:
  o Operates with all PIC Series
  o Up to 2MB Memory for PIC 18 Series

- High Speed USB Interface

- Full speed emulation:
  o 16 series up to 20MHz
  o 18 series up to 40MHz

- 2.8 / 5V Emulation

- Emulator Software downloadable (internet)

- 64K Words/128K Bytes of emulation memory on main board. 2M Words with Trace board

- Break on any address; Program memory match or Data memory access (2MB space)

- Break on Data Ram Access match conditions (=, not=, <, >)

- Break on Data Ram Data match conditions (=, not=, <, >)

- User Selectable Break on RAM Data Source or destination address

- AND / OR condition of Data Memory address & data breaks together

- Single Step, RUN, HALT, TRACE on both internal and external (user's target board) program memory access.

- On board software programmable clock (1KHz to 50 MHz)

ICEPIC3 is a universal In circuit emulator for the PIC Microcontroller. It is compact portable and lightweight, and offers exceptional performance and value.
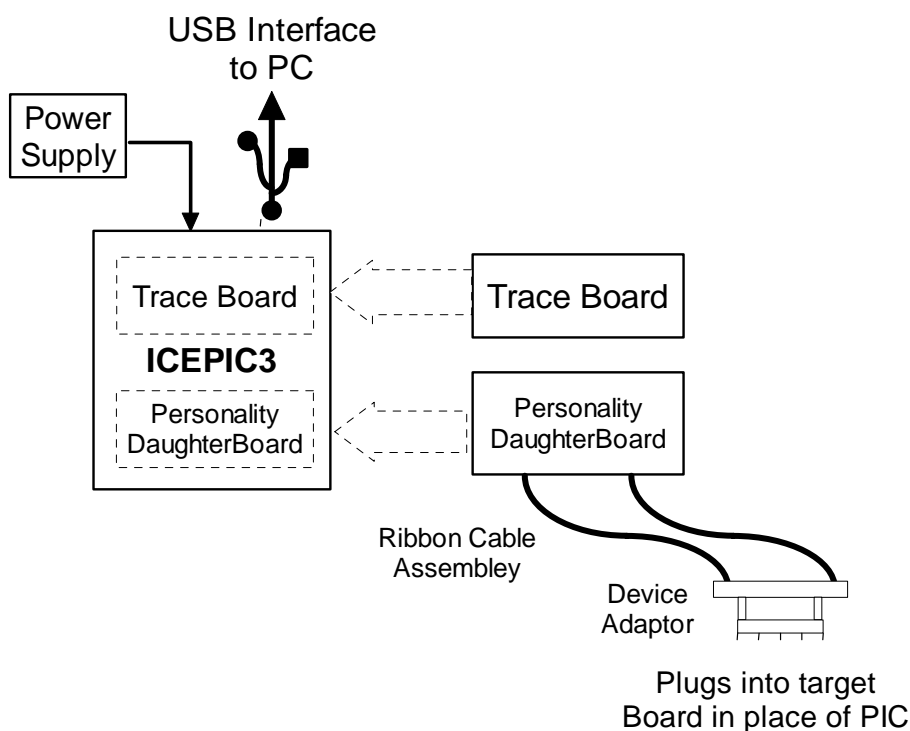
It has a quick 'hot' connection to the host desktop or Laptop via USB port. The system software can be upgraded at any time from the internet giving total upgrade ability.

The modular design consists of a motherboard with interchangeable daugtherboard which connects to the users target board. An additional plug in Trace board is available providing further real time analysis.

The system provides full speed, low voltage emulation with sophisticated unlimited precision breakpoints.

ICEPIC3 has **Hardware** support (patent pending) for high level language source level debug, and is also supplied with Microchip's MPASM. Operating within Microchip's MPLAB 32bit Integrated Development Environment gives the user easy control to perform efficient fast emulation.

ICEPIC3

USB Interface
to PC

Power
Supply

Trace Board

ICEPIC3

Personality
DaughterBoard

Trace Board

Personality
DaughterBoard

Ribbon Cable
Assembley

Device
Adaptor

Plugs into target
Board in place of PIC

ICEPIC3 System

The ICEPIC3 System is supplied with

- Main ICEPIC3 System Board
- PC software and User Manual
- Power Supply and USB Cable

Personality Daughterboards

Personality daughterboards* are supplied separately to configure the system specific PIC Micro . These are supplied with:

- Personality Daughterboard
- Probe / Ribbon Cable Assembly
- Target Board Plug in 'DIP' Header

New daughter boards are continually being developed to support PIC devices as they are released by microchip. Please check our website for the latest availability.

Additional Trace Board

Supplied as

- Add on PCB Assembly (Attaches to the underside of the ICEPIC Motherboard

Additional Accessories

A full range of adaptor is available to enable the probe cable to attach to the users target board as ;
- SMT
- PLCC
- QFP

Please see Datasheet DS054

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ICEPIC3

Technical Specifications

Features	Specification	Comments
Emulation Capability	PIC12, 16, 18	Capable of emulating all available PIC Micros. (Subject to availability of relevant 'daughterboard' adaptor)
Emulation Speed	1KHz to 25MHz	Limited by Emulation IC. Speed is user selectable via host software
Emulation Memory	2MB (max)	upto 2Mb with additional Trace Board to support 18Cxxx address space
Emulation Voltage	2.8 / 5V	Also capable of 1.8V emulation (Future Release)
External Emulation Capability	Yes	Single Step, RUN, HALT, TRACE on both internal and external (user's target board) program memory access.
Emulator Upgrade	Yes	Software Upgrades can be downloaded from internet.
IDE	Yes	MPLAB 32 bit Integrated Development Environment
Source Level Debug (high Level Language)	Yes	Hardware Support for any 'Microchip compatible' high level compiler
Assembler Support	MPASM	Microchip Universal Assembler Support
Real Time Trace	Yes	Using Optional Modular Trace Board(s)
Program Memory Break Points	Yes	Break on any address; Program memory match
Ram Data Break Points Break on Data Ram Match Break on Data Ram Access	Yes Yes Yes	Effectively unlimited number of Break Points, User Selectable Break on RAM Data Source or destination address; ● Break on Data Ram Access or Ram Data match conditions: ❑ Equal to ❑ Not Equal to ❑ Less than ❑ Greater than ● Break on AND / OR condition of Data Memory address & data breaks together
Stack, WDT Breaks	Yes	
Stack View	Yes	Direct Stack watch window available
Custom WatchPoints	Yes	Multibyte watch points can be set and modified
User Interface	Win 2000, NT, XP	Special driver support needed for USB support on NT
Host Interface	High Speed USB	Plug & Play windows peripheral
Power Supply	Supplied	Input: 110V-230Vac. Output: 9Vdc, 0.75A. IEC Adapter Socket

Feature comparison of ICEPIC3 and ICE2000

| Features	ICEPIC3	ICE2000
Type of connection to PC	HOT Plug High speed USB	Parallel
Break Points	Unlimited	Unlimited
IDE	MPLAB	MPLAB
Microchip Assembler & C Compatible	Yes	Yes
Real time Emulation	Full speed of Emulation Chip	Full speed of Emulation Chip
Emulation voltage	2.8 / 5V Emulation	2.5 / 5.5
External Emulation Capability	Yes	Yes
Emulation Capability	PIC12, 16, 18	PIC12C, 16, 17C, 18
Trace Buffer size	64K by 128bits*	32K by 128bits
Complex Break / Trigger Points	Unlimited External Inputs	8 External Inputs
Firmware Upgradeable	Yes	N/A
Real Time Trace	Yes*	Yes
Program Memory Break Points	Address and Data	Address and Data

*With optional trace board fitted

ICEPIC3

ICEPIC3 Trace Boards

Salient Features Of TRACE1 Board

- Trace depth of 64K. Width, 128 bits.

- Trace Points can be set on any program memory location(s) (2MB range)

- Trace all address (21 bits), or 16 bit Data Bus (Opcodes, TABLE read data, TABLE Write Data)

- Trace Real Time Stamp of 38 bits (a 38 bit real time counter).

- Trace Data Memory RAM address

- Trace Data Memory RAM data on source location access

- Trace Data Memory RAM data on destination location access

- Trace external 8 bits (user connectable)

- Two 16 bit counters for real time performance analysis of any address/address range

- Trigger Output on any address location access of program memory (2MB space)

- External Break signal support

- Optional 2MB program/emulation Memory for 18Cxxx devices

- Auto detectable for the type/features available on the board for host software
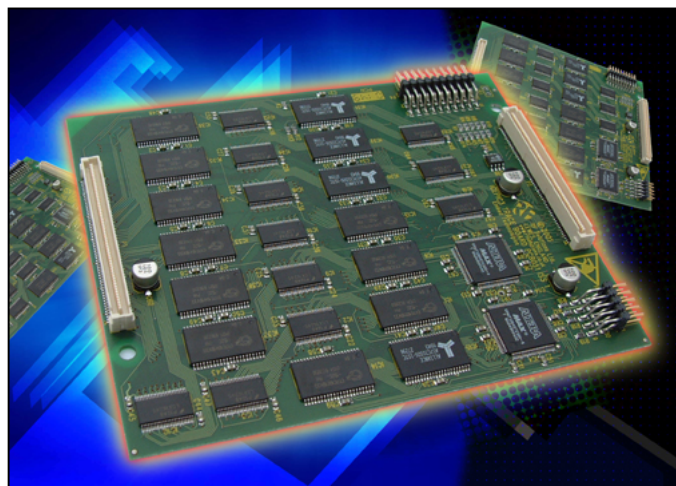
The Trace1 Board is available as an optional extra to ICPEIC3. It is a simple plug on connection to the motherboard.

Once installed, the add-on Trace module analyses and captures real time execution addresses, op-codes and read/writes of external addresses. It also traces all file RAM usage showing internal addresses and data values, as well as all accesses to special function registers including I/O, timers and peripherals.

Trace1 Board Technical Specifications		
Features	**Specification**	**Comments**
Emulator Interface	Direct connection	Trace board plugs onto ICEPIC Motherboard. ICEPIC Automatically detects the Trace board type and features available
Trace Memory	64K x 128bits wide	Maximum of 2Mbytes for 18Cxxx devices
Trace Point Control	Unlimited	Trace Points can be set on any program memory location(s) (2MB range)
Trace Capability	Yes	Trace all address (21 bits), or 16 bit Data Bus (Opcodes, TABLE read data, TABLE Write Data)
Trace memory capability	Yes	Trace Data RAM Address, Trace Data RAM Data at: 1. Source Address or 2. Destination Address
External Trace Capability	Yes	Trace external 8 bits (user connectable)
Real Time Stamp	Yes	Trace Real Time Stamp of 38 bits (a 38 bit real time counter).
Other Features		Two 16 bit counters for real time performance analysis of any address/address range
Trigger Outputs	Yes	Trigger Output on any address location access of program memory (2MB space) External Break signal support