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hitex
DEVELOPMENT TOOLS





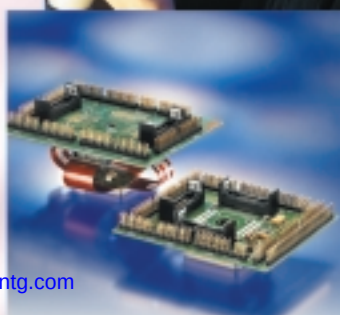
The DProbe167 and DBox167 Family













Embedding Software Quality

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For the kind of C167 emulation that only You want



From Entry Level to the Ultimate Debugging Experience

The DProbe family has been created by Hitex to address the diverse needs of development engineers creating embedded systems. The family includes an extensive range of configurable emulators and tools, designed to introduce powerful efficiency, insight and control into your debugging process.

Modular, upgradeable and so easy to use

The concept is based on providing: Flexibility due to a modular approach, entry-level solutions available for small or low-budget projects or just to get started, quick and easy upgrade paths, easy adaptation to meet diverse project requirements, full support of the popular C167 architecture, complete support of all C167 processor speeds, virtually unlimited trace and trigger capabilities in high-end systems, easy integration with third party tools and development environments

Futuristic Palm-Sized Emulation

Built with the latest bondout technology, the DProbe167 offers full non-intrusive in circuit emulation. The use of sophisticated ASIC technology and highly integrated emulator control hardware has made the DProbe167's size similar to that of a handheld probe. This allows much shorter distances to be achieved between the probe hardware, emulation chip and target system, which eliminates the need for long connection lines. These short distances allow the DProbe167 to support each microcontroller at its maximum frequency of operation, without having to use wait states. The entire range of operating voltages (from 2.7 to 5.5 V) is also supported.

XPER Module to Match the Derivative of Your Choice

XPER modules provide fast and accurate add-on support for numerous derivatives by incorporating the peripherals of these derivatives into the bondout emulation process. As well as supporting the derivatives of today, new XPER modules will become available to match the release of future derivatives. So you won't have to worry about expensive drawn out changeovers when choosing future derivatives. XPER modules are simply plugged into the DProbe167, so exchanging them couldn't be simpler.



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DBox167 for high level in-circuit emulation

Affordable Emulation That's Easy to Use

The DProbe167 is designed to provide software developers with the maximum ease of use – installation is plug and play, Hitex PressOn Technology greatly simplifies adaptation to the target system and there is no need to set emulator specific jumpers or switches. The basic unit provides emulation memory and hardware-controlled execution breakpoints as well as software breakpoints. The DProbe167 is particularly well suited to debugging awkward software problems and thanks to its affordable price, it can be provided to each developer in a team as a personal entry-level hardware-based tool.

Upgrade It and Let It Grow with Your Application

You'll never need to worry about your application's increasing thirst for memory. If more memory is required at some stage, simply plug-in a DMemory module – they're available in sizes up to 2 MByte. These modules provide fast dual-ported memory allowing the reading and writing of data to take place on the fly in real-time.

If a greater level of functionality is required than that offered by the basic system, a DTrace module can be snapped in. You'll then be able to track down complex error conditions and review the source code associated with them. You'll also have two bus event recognizers at your disposal and a trace buffer of up to 128KB of frames including timestamps.

Adding the DMemory and DTrace options to a DProbe167 results in a powerful mid-range emulation system that is able to get to grips with complex error conditions. Statistical Performance Analysis and Code Coverage features are also provided - even at this level.



The modular DProbe/DBox concept allows you to upgrade existing DProbes to high-end systems. Simply remove the DTrace module and plug in the DBox of your choice. An existing DBox167-1 can be upgraded to a DBox167-2. This flexible modular approach lets the developer add to or subtract from the total functionality based on specific project requirements. A DProbe167 and a DBox167 can be mixed and matched to build different DProbe167 platforms with varying capabilities.

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DBox167 – high-end features and upgrade path



High-end Features to Ensure Software Quality

Enhanced Event Recognition and Trace Buffer – For analyzing occasional or critical events

The DProbe/DBox combination provides outstanding support for detecting unexpected system behavior and determining its causes. The event system is based on a sophisticated eight-level sequencer for runtime and trace control. Each level has its own complex trigger and break conditions.

The trace buffer can capture up to 512K of frames, which contain processor information, timestamps and 48 additional external input lines. Together with the complex event recognition, this generous amount of trace buffer memory facilitates the long-term analysis of critical or infrequent events.

Code Coverage – To determine how your code's really used

As an upgrade to the statistical analysis available with DProbe and DTrace alone, the Code Coverage feature of the DBox167 offers the most accurate analysis available for the C167 microcontroller family.

The DBox167 tracks each executed instruction. This coverage analysis is performed independently of whether execution takes place out of internal ROM or external memory. The analysis can also be performed conditionally based on a certain sequencer level. This could for example allow the DBox167 to illuminate the usage of real-time kernel services on behalf of a specific task. A log of coverage results can be easily viewed directly within the user's source window.

Performance Analysis – To ensure no area of code is burdening the target system

The DBox167 can find code bottlenecks, thus helping to eliminate the possibility of system failures due to unforeseen system overloading. The DBox167 offers an analysis of dedicated execution time for objects (i.e. modules, functions and interrupt services). A graphical display of these execution times then immediately reveals program code that needs to be revised. To detect and analyze execution times based on a certain program history, various sequence levels can control the performance analysis.

The Upgrade Path – Select, Upgrade, Pick'n Mix

Hitex offers three DBox167 variants in increasing levels of performance. Choose a DBox167-1 to enter the world of enhanced event recognition and trace capabilities. Choose a DBox167-2 for a unique verification and optimization tool offering unlimited read/write-event recognition. Or choose DBox167-3, which combines all the functionality of both, the –1 and –2 together with long-term analysis provided by an extremely large trace buffer. One of these models is bound to fulfill all of your in-circuit emulation requirements.

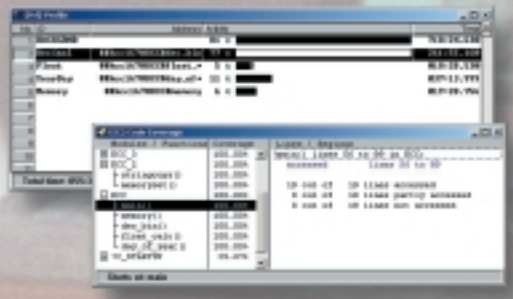


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HiTOP – the ultimate user interface for embedded developers

All the High-Level Features You Need

HiTOP is the Windows based universal user interface for nearly all Hitex development tools. It provides complete HLL debugging and rapid access to all emulator resources such as trace, trigger, sequencer, performance analysis, coverage, memory mapping and setup of the target system.



HiTOP is the ideal tool for testing in both high-level and low-level languages. The interface's core functionality includes the setting of breakpoints, examination and modification of variables, display and modification of structures according to their type by simply clicking within the List/Instruction window, tracking of any branched list or tree using simple mouse clicks, dynamic analysis of C-expressions and the detailed display of all program object information. Ease of use is guaranteed by the toolbar controls and tool-tip messages included.

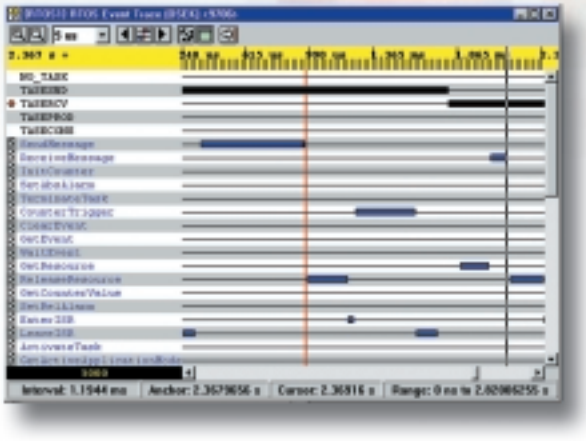
An efficient file format used by the symbol file provides fast access to details stored for each symbol in the application. Furthermore, the Symbol Manager only loads the host PC's main memory with parts of the file that are needed at the time. So if memory resources on the host PC are limited, it's still possible to test very large applications that contain extensive symbolic information.

Save Time and Money by Adding Tools You're Already Familiar With

With the aim of maximizing the test and development benefits offered to developers of embedded systems, engineers at Hitex have enabled the HiTOP user interface to be integrated with popular 3rd-party tools such as EasyCode, X32, CodeWright®, or C-Assistant, allowing the application to be tested at structogram level. Even integrated high-end development environments like Tornado are able to communicate with HiTOP.

Real-Time Operating System Support

HiTOP supports most major RTOSs. This provides a fully transparent overview of the entire software system at any time by displaying criteria such as task-lists, detailed information of a specific task, message queues, delays, and memory objects.



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Technical data and add on accessories



Add On Accessories

PCMCIA-Card

Create a mobile test environment with this plug & play host interface card for laptop PCs. Short download times and fast emulator responses are guaranteed.

Logic Probes

These bi-directional probes are intended for a DBox's input and output signals. Each probe provides eight input/output lines to trigger external hardware or include input signals into trace buffer or event recognition facility.



XPER Modules

An XPER module can be plugged into a DProbe to support a new processor derivative. Two chip emulation guarantees inexpensive and quick upgrades to new derivatives, which are not fully supported, by the latest bondout chip.

Test/Measurement Adapter

This custom adapter supplies processor signals to external instruments that are used as logic analyzers. The adapter is placed between the actual target adapter and the emulator. Test connections for new hardware can be set up quickly because all processor signals are available and marked at a connector with 2.54 mm pitch.

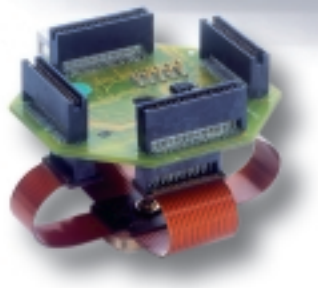
PressOn Adapter

This revolutionary adaptation technology provides a safe connection to the specific housing used in the target. It is a simple, flexible adapter, particularly useful for mobile debugging.

The PressOn adapter combines the advantages of minimum space requirements on the target PCB with a very reliable and robust pin contact. Contact between the target system and the emulator is no longer achieved using metal contact springs or soldered connections, but by using flexible contact elements.

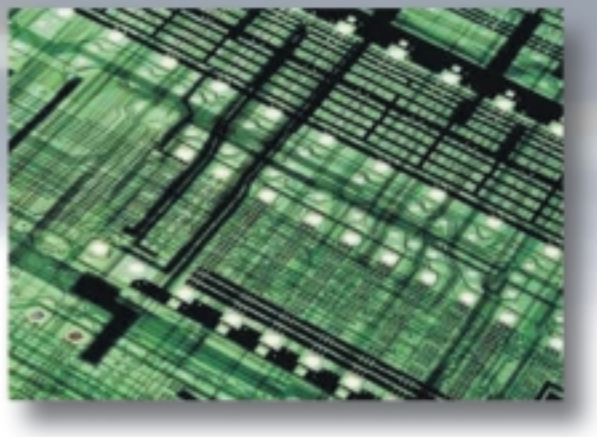
The Basic DProbe167 Emulator

Bondout CPU	C167E3, fully transparent, non-intrusive debugging
Operating voltage	Supports voltages from 2.7 up to 5.5 Volts
Overlay memory	1 MByte mapable in complete 16 MByte address range Selectable granularity (1 kByte up to 32 kByte) Zero wait state access (@33.3 MHz) Write protection (ROM emulation)
On-chip ROM	Selectable ROM size up to 512kByte / 32-bit access
Breakpoints	8 hardware execution breakpoints (break before make) 256 software breakpoints
Clock generator	Internal clock generator, programmable from 1 MHz to 100 MHz (100 kHz steps)
Control lines	Enable/disable control for RESETIN, RESETOUT, NMI, XTAL2
Adaptation	Adaptation via quad connector system to all existing adapter and chip packages. Compatible with Hitex PressOn technology
Dimensions	91 x 26 x 175 mm [W x H x D]
Connection to host	HIF PCI card, HIF PC card (PCMCIA), LPTHIF (Printer Port) Download rate up to 300 kByte/sec
Power	Individual power supply (80-260 VAC) or direct 5V DC connection
Approvals	CE, GS, FCC, UL, CSA



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Technical data
DMemory and DTrace



Get Trace Information With A DTrace Module

Real-time trace module to trace all CPU bondout buses and control signals. Complex event setting on CPU internal/external activity. Trace/Trigger on register access.

	DTrace64	DTrace128
Trace memory	64k samples 144 channels	128k samples 144 channels
Timestamp	48 Bit / 50 ns resolution	
Events	2 complex events	
Event actions	Break, trigger, qualify trace, start/stop trace, change level	
Sequence levels	2 sequencer levels	
Break sources	Single event, ORed event, End of recording	

Improve Your System With A DMemory

Dual ported overlay memory to watch and to modify memory locations without real-time violation. Freely mapable in the whole 16 MByte CPU address range

	DMem-1	DMem-2
Total memory size	1 MByte	2 MByte
Block size	512 kByte	512 kByte
Granularity	1k...32 kByte	1k...32 kByte
Access speed (@33.3MHz)	Zero wait states	Zero wait states

Software

Debugger for DProbe167	HiTOP, µVision2, CrossView, fast-view166
Debugger for DBox167	HiTOP
Operating systems	Windows 95/98, Windows NT, Windows 2000
Supported RTOS	RTX166, PXROS, CMX-RTX, Nucleus, OSE, ProOSEK, osCAN, OSEKtr
Case Tools	EasyCase, X32, DA-C
Compiler	Support of all popular compilers (Keil, Tasking, HighTec)

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Technical Data DBox167

	DBox-1	DBox-2	DBox-3
Trace memory Depth / channels	256k / 192 ch.	256k / 192 ch.	512k / 192 ch.
Standard range comparators Instruction address Operand read address Operand write address	–* –* –*	16 MB 16 MB 16 MB	16 MB 16 MB 16 MB
Code coverage Event controlled start/stop	–*	yes	yes
Performance Analysis Event controlled start/stop	–*	yes	yes

*) upgrade available

The DBox167 Will Cover All Your Needs

Real-time trace with 48 Bit timestamp / 10 ns resolution. Up to 48 external input signals (glitch latch mode). 8 complex events / unlimited range events. Timer and counter available. 2 independent sequencers for break and trace (8 levels). Event controlled start/stop of non statistical realtime code coverage or performance analysis

Max. Frequency (MHz)	40
Timer Bits Resolution (min./max.)	2 + 1 14 Bit 100 µs/1 sec
Timestamp Bits / Resolution	48 Bit / 10 ns
Complex event counter Max. count value	3 65535
Execution event counter Max. count value	7 256
Complex range events	4
External line trace	48 channels
Recording mode Clock cycle recording Glitch latch mode	 yes yes
Output lines Event controlled Predefined	 4 4
Connection to host	HIF PCI card, HIF PC card (PCMCIA), LPTHIF (Printer Port)
Dimensions	254 x 73 x 355 mm [W x H x D]



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