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To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

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V850 Series Development Environment

Empower your creativity
V850
Embedded Controller

2006-February

V850 Series Development Environment

The V850 Series development environment encompasses a range of tools designed to enable smoother, faster, and more precise development of application systems that employ NEC Electronics' original V850 Series of embedded RISC microcontrollers. Each tool is provided with functions that optimize the performance of the V850 Series.

Development Environment Background

The expanded scale of hardware and software in recent application systems has brought with it an increase in the level of complexity.

Successful development in today's environment means being able to **easily expand and**

improve functions, and efficiently raise the performance of the system. With its V850

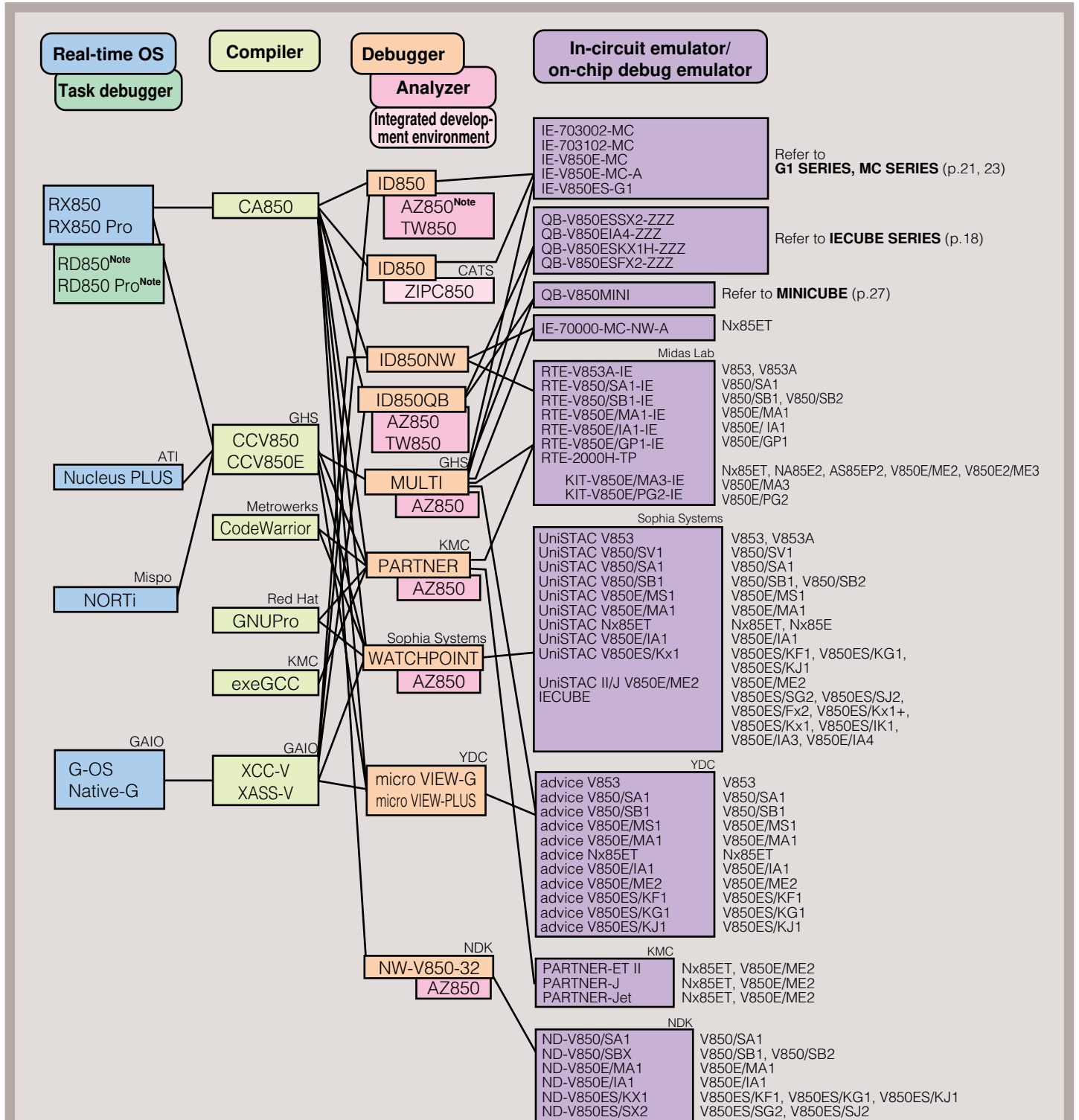
Series, NEC Electronics now gives developers the opportunity to achieve this. To enable the development of systems that capitalize on the excellent features of these high-performance devices, NEC Electronics provides support in the following three key areas: reduced development time, improved system performance, and coordination with partners.

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DEVELOPMENT ENVIRONMENT FOR V850 SERIES (1/2)

In-Circuit Emulator and On-Chip Debug Emulator Environment

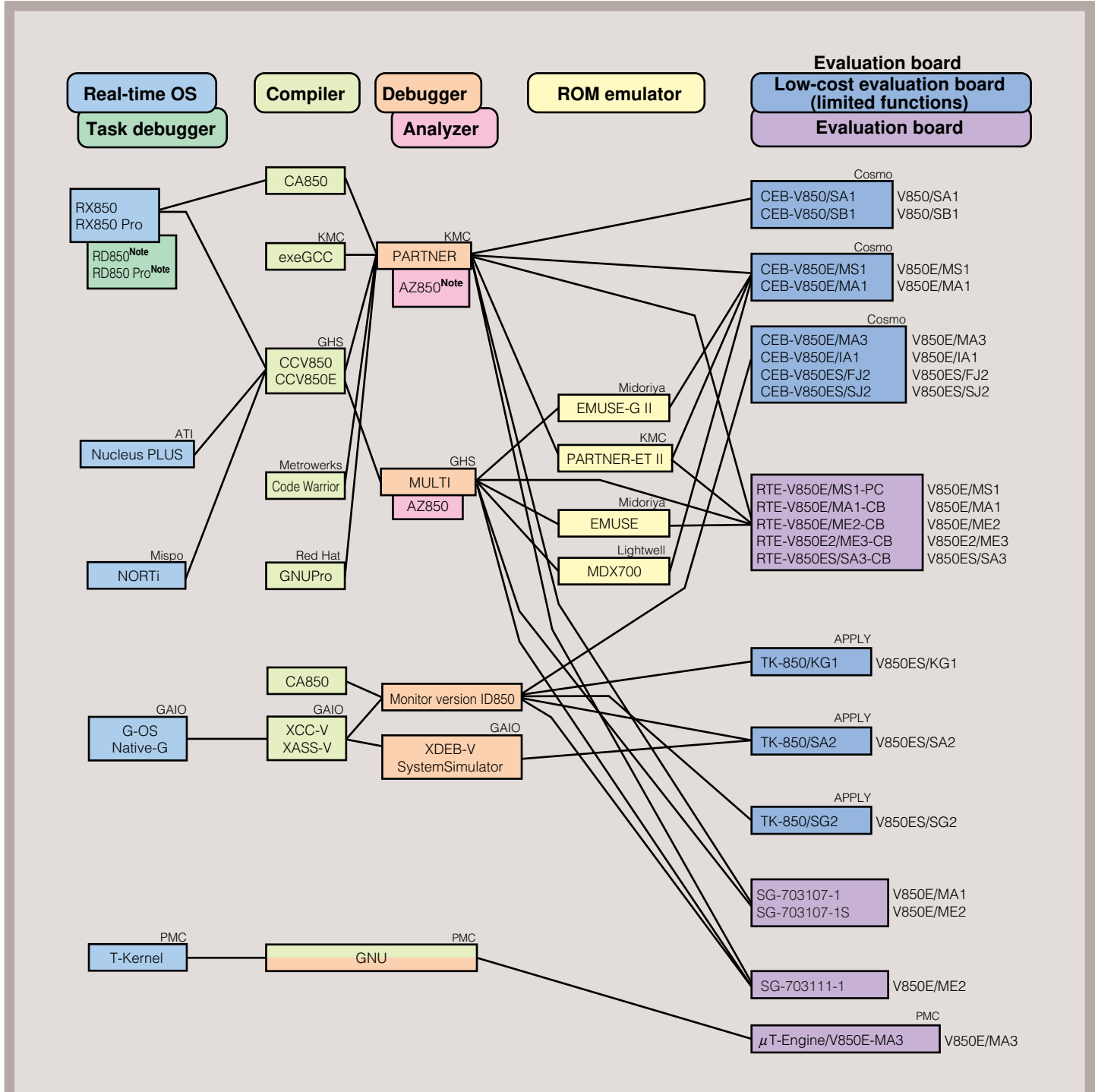


Note RD850, RD850 Pro, and AZ850 can be used with ID850, ID850QB, MULTI, PARTNER, and WATCHPOINT.

- | | | | |
|-------------|---------------------------------|-----------------|---------------------------------------|
| ATI: | Accelerated Technology, Inc. | Mispo: | MiSPO Co., Ltd. |
| CATS: | CATS, Inc. | NDK: | Naito Densai Machida Mfg. Co., Ltd. |
| GAIO: | GAIO TECHNOLOGY CO., LTD. | Red Hat: | Red Hat, Inc. |
| GHS: | Green Hills Software, Inc. | Sophia Systems: | Sophia Systems Co., Ltd. |
| KMC: | Kyoto Microcomputer Corporation | YDC: | Yokogawa Digital Computer Corporation |
| Metrowerks: | Metrowerks Corporation | Others: | NEC Electronics Corporation |
| Midas Lab: | Midas Lab Co., Ltd. | | |

DEVELOPMENT ENVIRONMENT FOR V850 SERIES (2/2)

ROM Emulator and Evaluation Board Environment



Note RD850, RD850 Pro, and AZ850 can be used with MULTI and PARTNER.

- | | | | |
|----------|---------------------------------|-------------|-----------------------------|
| APPLY: | Application Corporation | Lightwell: | Lightwell Co., Ltd. |
| ATI: | Accelerated Technology, Inc. | Metrowerks: | Metrowerks Corporation |
| Cosmo: | Cosmo, Inc. | Midas Lab: | Midas Lab Co., Ltd. |
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| KMC: | Kyoto Microcomputer Corporation | PMC: | Personal Media Corporation |
| | | Others: | NEC Electronics Corporation |

SP850

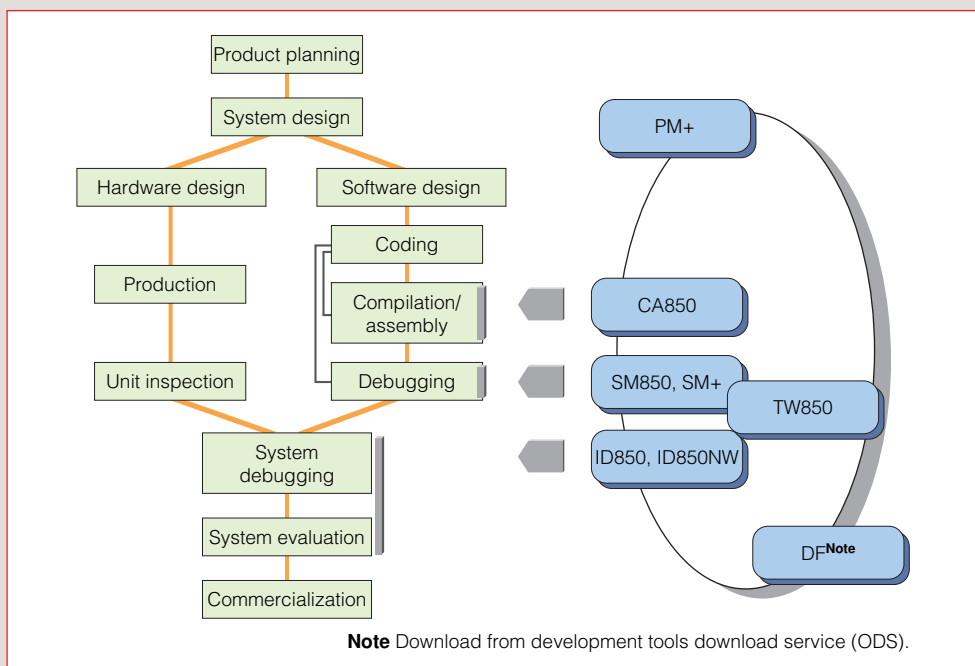
The SP850 software package combines various V850 Series development tools and software products previously sold individually.

Package Contents

- ◆ C compiler package (CA850)
- ◆ Project manager (PM+)
- ◆ Integrated debugger (ID850, ID850NW)
- ◆ System simulator (SM850, SM+)
- ◆ Performance analysis tuning tool (TW850)

Features

- ◆ Integrated development environment from language tools to debugger and analysis tools
- ◆ Simple installation using integrated installer
- ◆ Enhanced linking functions for development tools and software products
- ◆ Optimized object debugging with compiler
- ◆ High-speed simulation of peripheral function operation
- ◆ Program performance analysis and tuning
- ◆ Management of different versions of the same tool
- ◆ Sample program for development tool operation verification (with user's manual) included
- ◆ Timely version upgrade via development tools download service (ODS) as well as version upgrade via supply media



COMPILERS

The following compilers are supported in the V850 Series.

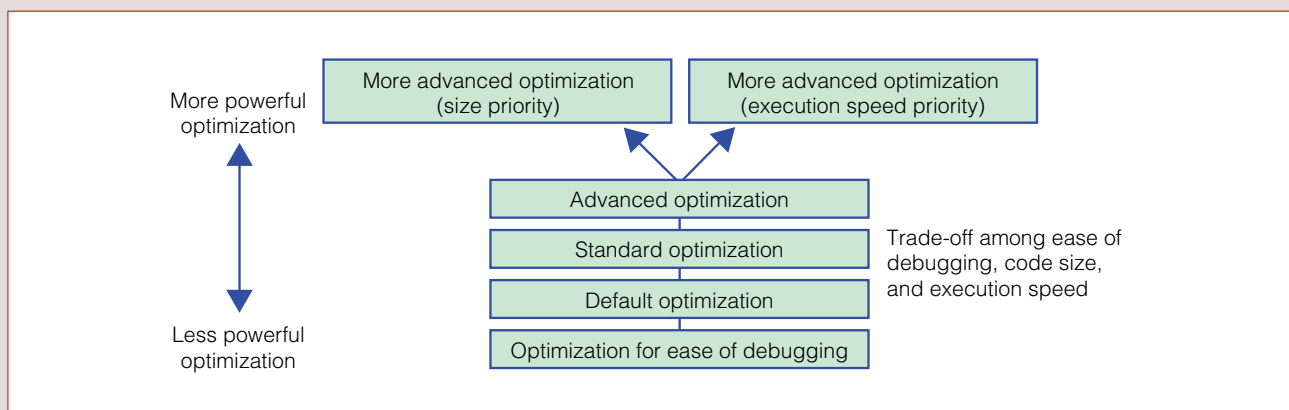
CA850: C compiler package for V850 Series

Features

- ◆ Complies with ANSI-C standard for C language programming
- ◆ Includes powerful optimization functions
- ◆ Provides functions optimized for embedded systems
- ◆ Provides multiple utilities

Powerful Optimization Functions

The CA850 comes with "powerful optimization functions" that make the most of the device's performance features. Users can select among six optimization levels, and can even set optimization levels for individual sources.



Functions Optimized for Embedded Systems

The CA850 provides functions optimized for development of the embedded systems.

○ Functions related to size reduction of ROM/RAM used and acceleration of execution speed

- ◆ Selection of register mode (software register bank function)
 - Setting a limit on the number of registers that can be used by the compiler (either 22 or 26 registers) reduces the interrupt overhead (saving to and restoring from registers).
- ◆ Run-time library is used for processing of function prologues and epilogues
 - Code size is reduced by library functions that can be called both when saving to registers and when restoring from registers (slightly accelerates execution speed).
- ◆ Structure/union packing function
 - This packing function fills holes between members of structures or unions due to alignment, which reduces code size (slightly accelerates execution speed).
- ◆ Register allocation function for external variables
 - When in 22 or 26 register mode, the user can freely allocate external variables to any usable register and can change the memory access to the register access. This can shrink the code size while accelerating execution speed.

○ Functions implemented via C language descriptions

- ◆ Data and variables can be allocated to specified memory areas.
 - Enables allocation of data and/or variables to memory areas that can be accessed at high speed
- ◆ Interrupt/exception handler processing can be coded in C language.
 - Register save/restore processing required in assembly code can be performed automatically by compiler
- ◆ Assembly code instructions can be inserted into C language source code.
 - Useful for partial, high-speed processing, etc.
- ◆ Access to peripheral I/O register can be handled as ordinary variable access.
 - Uses "device files" that contain definitions of peripheral I/O register names, interrupt request names, on-chip memory size, and other information
- ◆ Real-time OS (RX850, RX850 Pro) tasks can be coded
 - Reduces code not required for tasks

Accessory Utilities

The CA850 provides various utilities that can be used for development of embedded systems.

○ ROMization processor (romp850)

The initial values of variables must be set before running any applications when they are declared with initial values. The romp850 utility generates these initial values and the information to be copied. This ROMization processor's functions can also be used to generate information to be copied when ROM code is deployed to RAM before executing.

○ HEX converter (hx850)

This utility converts executable object files to a hexadecimal format. The following hexadecimal formats are supported.

- ◆ Intel expanded hex format
- ◆ Motorola S type format (standard address)
- ◆ Motorola S type format (32-bit address)
- ◆ Extended Tek hex format

○ Section file generator (sf850)

This utility allocates frequently used variables (among all variables used by an application) to an internal RAM area.

○ Dump command (dump850)

The dump command displays the contents of a specified object file or archive file in an easy-to-read format.

○ Disassembler (dis850)

This utility converts text-attribute data (program code) from object files or archive files into assembly language and displays the assembly language code.

○ Cross reference tool (cxref)

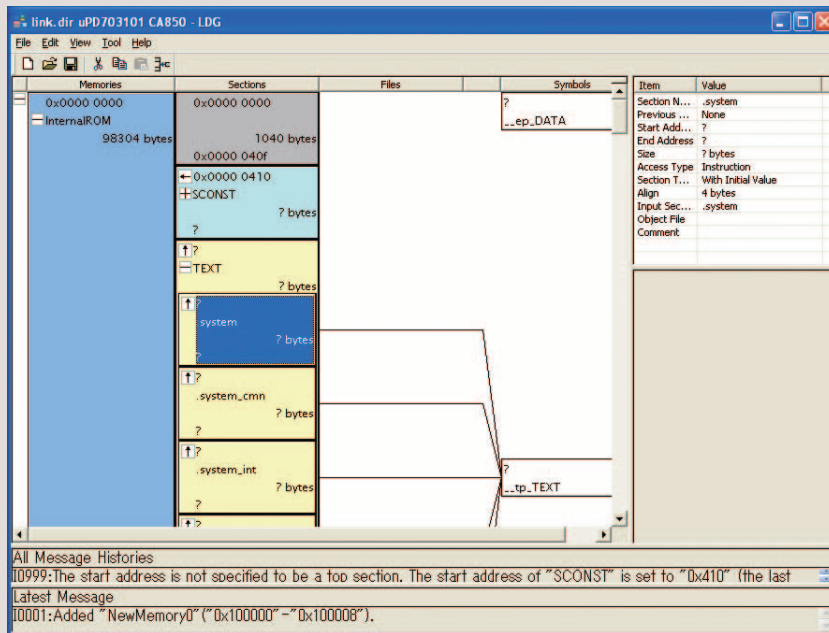
This utility outputs cross reference information, tag information, call tree information, function metrics (number of lines in function, function's call frequency, etc.), and call data base (function call information).

○ Memory layout visualization tool (rammap)

This utility displays a visualization of variable allocation information.

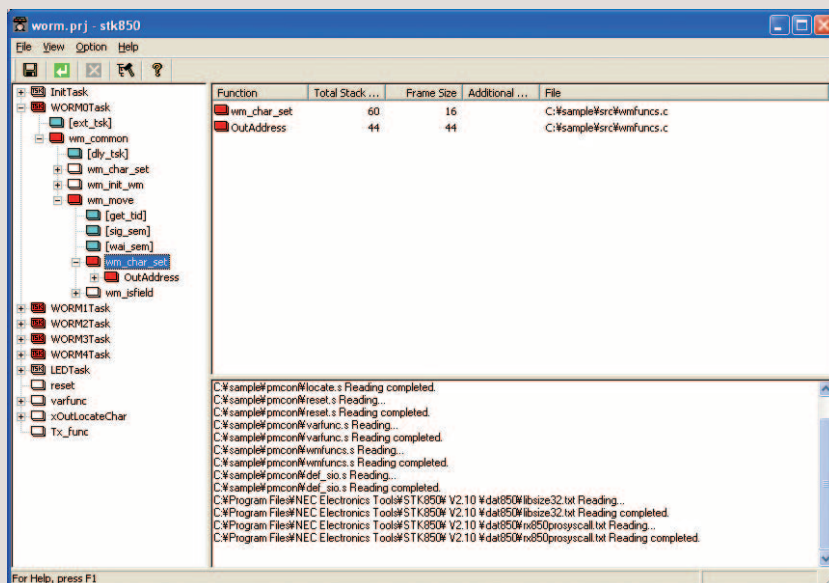
○ **Link directive generator (LDG)**

This utility can be used to generate (via the GUI) "link directive files" that specify the section allocation order, addresses, etc.



○ **Stack usage tracer (stk850)**

This utility statically estimates the stack size used by sets of functions within a project. Estimations can also be performed as the real-time OS task (RX850, RX850 Pro).

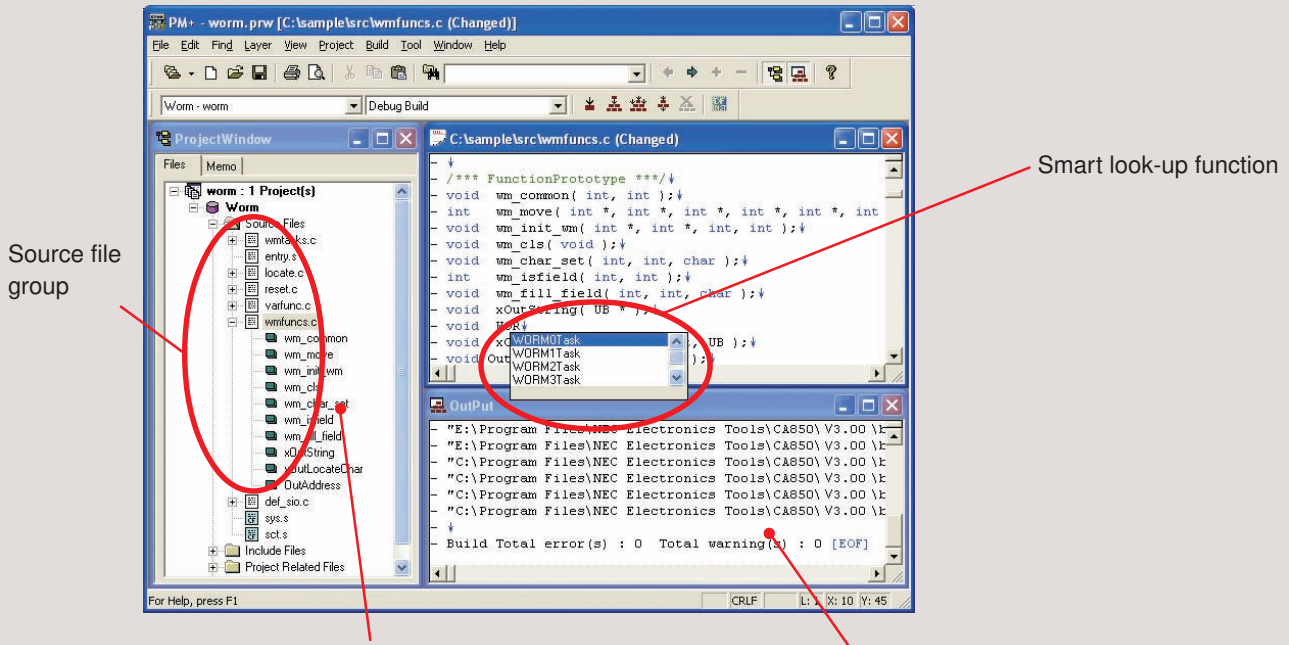


PROJECT MANAGER (PM+)

The project manager enables more efficient development by integrating tools such as a C compiler and debugger.

Features

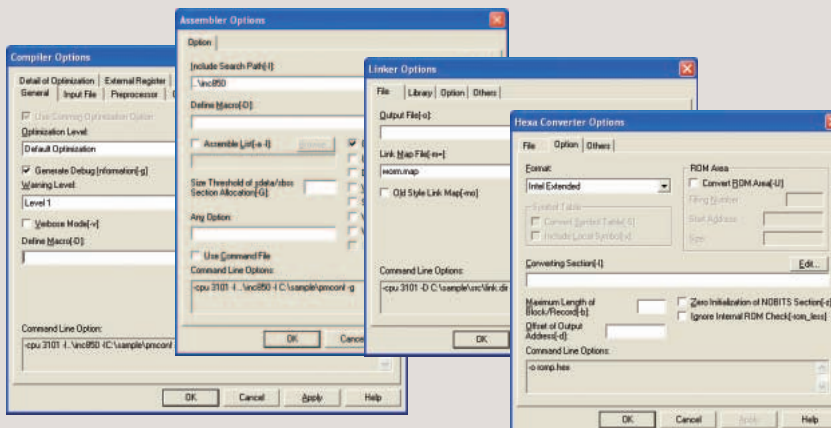
- ◆ Enables editing, build, and debugging, as a series of operations
- ◆ Includes an editor function
 - Includes a smart look-up function
- ◆ Menus and tool bars can be customized



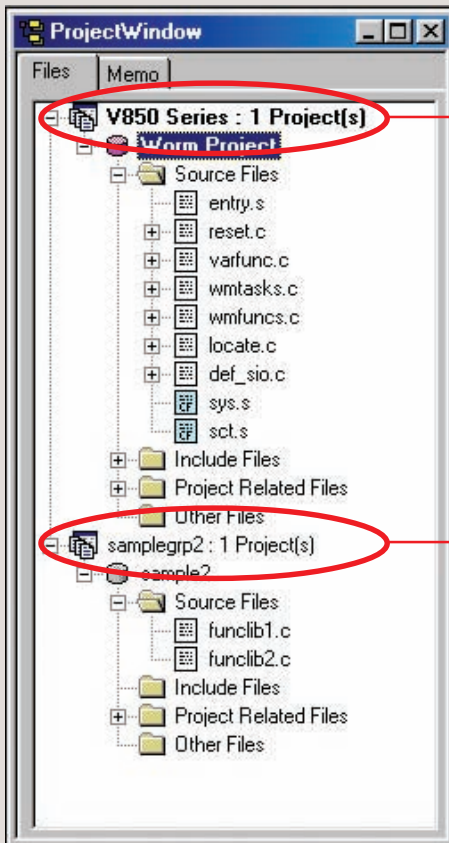
Click function name or task name from source file to jump to corresponding location in source code

Build execution progress display

- ◆ Tool options can be specified via dialog boxes



- ◆ Facilitates project management
 Enables management of source code and documents as well as version management using CVS.
 Multiple projects can be managed in the same work space.



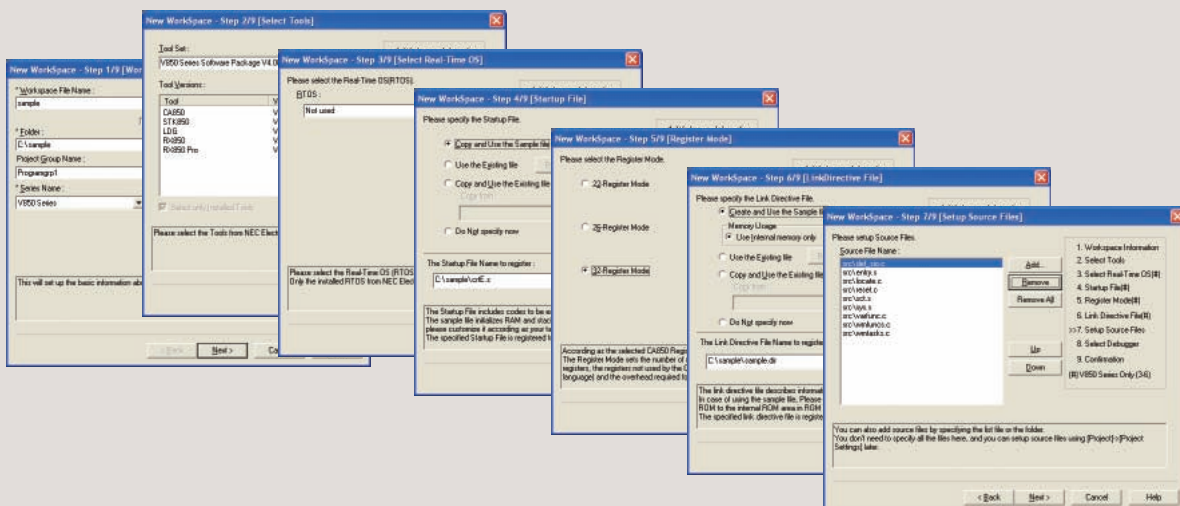
This is the "main project."

This is the "library creation project."

This kind of management is enabled.

Includes a "batch build" function that builds multiple projects as a single batch.

- ◆ Wizards can be used to create projects
 Wizard screens provide an easier way to register target device names and required source files, to specify whether or not a real-time OS will be used, and to set startup routines or link directive files.



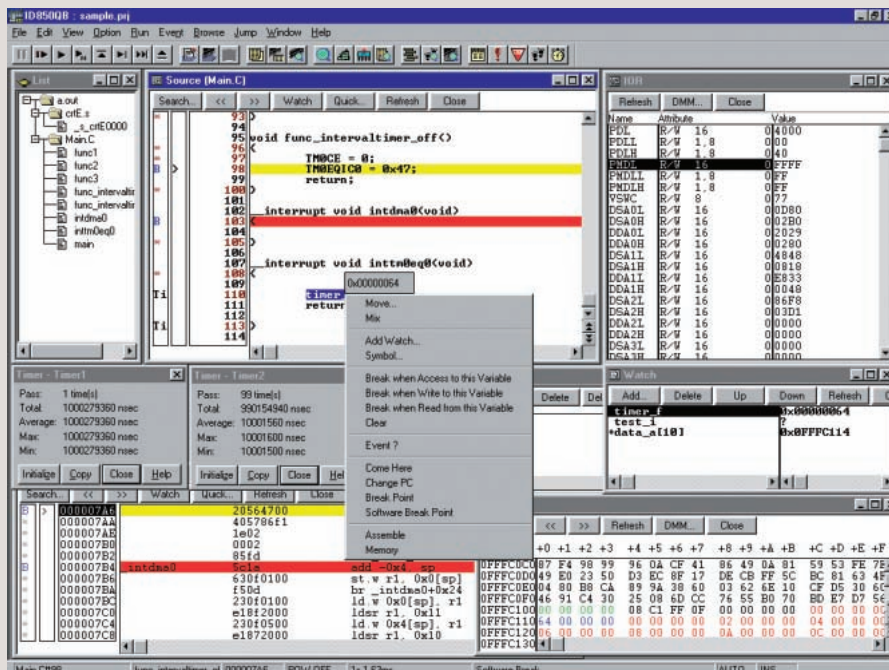
DEBUGGERS

The following debuggers are available.

- ID850: C source debugger for V850 Series (supporting MC series and G1 series)
- ID850NW: C source debugger for V850 Series (supporting the N-Wire emulator)
- ID850QB: C source debugger for V850 Series (supporting MINICUBE and IECUBE)

Features

- ◆ Source can be debugged.
 - Source program in C and assembly language can be debugged.
- ◆ Wealth of debug functions
 - By using the event functions of an in-circuit emulator (IE), break, trace, and time measurement, and coverage measurement can be executed.
 - In addition, basic debugging such as break and run-break time measurement can be executed also for on-chip debugging (OCD) by using the event functions of the debug control unit (DCU).
- ◆ Saving debugging environments
 - Debugging environments such as information on setting of breakpoints and events, downloading of files, and display status of windows can be saved as a project file.
 - By loading this project file, the debugging environments can be restored.
- ◆ Function expansion by Tcl
 - Batch processing and hook processing on the command line and creating user's original custom windows can be performed by using Tcl/Tk (Tool Command Language).
- ◆ Function expansion by TIP or ToolLink
 - By using a task debugger (RD) and system performance analyzer (AZ) supporting TIP (Tool Interface Protocol) or ToolLink, debugging efficiency of a user program using a real-time OS (RX) can be dramatically enhanced.



Debugger Usage Environment

Target Device	Debugger	In-Circuit Emulator or On-Chip Debug Emulator		Host Machine	
		Main Unit	Emulation Board or Option Board		
V850ES/SG2, V850ES/SJ2	ID850QB	QB-V850ESSX2-ZZZ	—	PC 9800 series IBM PC/AT or compatible	
V850E/IA3, V850E/IA4, V850ES/IK1		QB-V850EIA4-ZZZ			
V850ES/KE1, V850ES/KE1+, V850ES/KF1, V850ES/KF1+, V850ES/KG1, V850ES/KG1+, V850ES/KJ1, V850ES/KJ1+		QB-V850ESKX1H-ZZZ			
V850ES/FE2, V850ES/FF2, V850ES/FG2, V850ES/FJ2, μ PD703229Y, μ PD70F3229Y		QB-V850ESFX2-ZZZ			
V850E/ME2, V850E/MA3, V850E/IA4, V850E/SV2, V850ES/SG2, V850ES/SJ2, V850ES/FE2, V850ES/FF2, V850ES/FG2, V850ES/FJ2, μ PD70F3229, V850ES/KJ1+, V850ES/KJ1		QB-V850MINI			
V850ES/SA2, V850ES/SA3	ID850	IE-V850ES-G1	IE-703204-G1-EM1		
V850ES/KF1, V850ES/KG1, V850ES/KJ1			IE-703217-G1-EM1		
V850ES/SG2, V850ES/SJ2			IE-703288-G1-EM1		
V850ES/PM1			IE-703228-G1-EM1		
V850ES/FE2, V850ES/FF2, V850ES/FG2, V850ES/FJ2, μ PD703229Y, μ PD70F3229Y			IE-703239-G1-EM1		
V850ES/ST2			IE-703220-G1-EM1		
V850E/SV2		IE-V850-MC-A	IE-703166-MC-EM1		
V850E/MA1, V850E/MA2			IE-703107-MC-EM1		
V850E/IA1		IE-V850E-MC	IE-703116-MC-EM1		
V850E/IA2			IE-703114-MC-EM1		
V850E/MS1(5V), V850E/MS2(5V)		IE-703102-MC	IE-703102-MC-EM1		
V850E/MS1(3.3V)			IE-703102-MC-EM1-A		
V850/SA1		IE-703002-MC	IE-703017-MC-EM1		
V850/SB1, V850/SB2			IE-703037-MC-EM1		
V850/SV1			IE-703040-MC-EM1		
V850/SF1			IE-703079-MC-EM1		
V850/SC1, V850/SC2, V850/SC3			IE-703089-MC-EM1		
V853			IE-703003-MC-EM1		
V850E/ME2			RTE-2000-TP		—
V850E/MA3					KIT-V850E/MA3-IE
NB85ET	—				

Manufactured by Midas Lab Co., Ltd.

Inquiries to: Naito Densai Machida Mfg. Co., Ltd. (Tel: 81-45-475-4191)
 CORE Corporation (Tel: 81-3-3795-5171)
 Application Corporation (Tel: 81-42-732-1377)

SIMULATORS

The following simulators are available.

- SM+ for V850ES/Sx2: Instruction + peripheral simulator for V850ES/SG1, V850ES/SG2, and V850ES/SJ2
- SM+ for V850ES/Fx2: Instruction + peripheral simulator for V850ES/FE2, V850ES/FF2, V850ES/FG2, and V850ES/FJ2
- SM+ for V850: Instruction simulator for V850E and V850ES Series
- SM850: Instruction + peripheral simulator for V853, V850/SA1, V850/SB1, V850/SB2, V850/SF1, V850E/MS1, V850E/MA1, V850E/IA1, V850E/IA2, V850ES/SA2, V850ES/SA3, V850ES/KF1, V850ES/KG1, V850ES/KJ1, V850/SC1, V850/SC2, V850/SC3

Instruction + peripheral simulators: Can simulate instruction execution by the CPU and internal peripheral functions such as timers and UART.

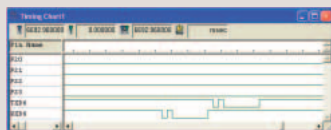
Instruction simulators: Can simulate only instruction execution by the CPU.

Features

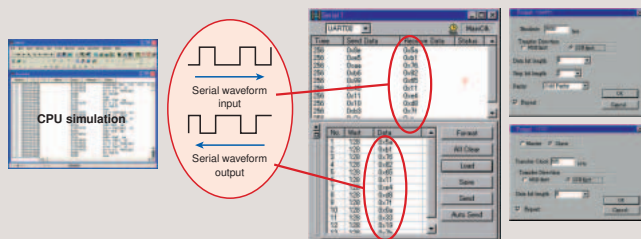
- ◆ Target-less evaluation
 - Microcontroller operations, including the operations of the on-chip peripheral units and interrupt servicing, in addition to the operation of the CPU, can be simulated.
 - Programs can be debugged in an early stage without an in-circuit emulator.
- ◆ Same operability as debuggers for V850 Series
- ◆ Various simulation functions
 - System debugging on PC (I/O panel window)
 - Dummy target systems can be organized by placing buttons and LEDs.
 - Panels having the same operability as Microsoft PowerPoint can be created.



- Monitoring I/O waveform of microcontroller (timing chart window)
- Waveforms can be monitored in an oscilloscope-like image.



- Simulation of serial transmission/reception (serial window)
- Transmits serial data to the microcontroller and displays reception of serial data from the microcontroller.



PERFORMANCE ANALYSIS TUNING TOOL

The following performance analysis tuning tool is supported by the V850 Series.

TW850: Tuning tool for V850 Series

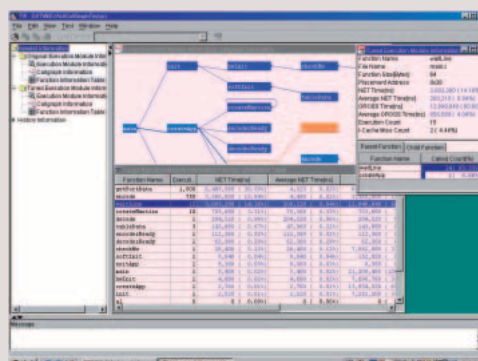
The TW850 performance analysis tuning tool is a tuning tool for embedded software.

It enables performance estimation, performance prediction, and performance improvement through easy operation.

The TW850 tool can also be used for the V850E with on-chip cache and other system LSI devices.

Features

- ◆ Easy-to-use interface
 The wizard-type GUI allows easy specification of conditions. Moreover, profiling, performance analysis, and tuning are automatically performed.
- ◆ Profiling function
 Two profiling approaches are available, one in which trace data is analyzed during execution using the in-circuit emulator trace function, and another in which software analysis is performed by inserting probe code into the target program.
- ◆ Performance estimation
 Performance analysis changing the internal ROM size, instruction cache size, etc. is possible, and the analysis results can also be used for microcontroller selection.
- ◆ Analysis result output function
 The following analysis results are output.
 - Interfunction call relations, call count information
 - Function execution time information
 - Cache miss-hit information
- ◆ Performance tuning function
 The following types of tuning can be performed.
 - Instruction cache optimization
 (Optimum placement of functions so as to reduce cache miss-hits)
 - High-speed access memory allocation optimization
 (Allocation of functions that constitute bottlenecks to high-speed access memory such as internal ROM)



The following auto verification systems are supported in the V850 Series.

XO850: Auto verification system for V850 Series

XO850 is an auto verification system for the V850 Series.

At the test process (the final process in software development), this system performs auto execution and auto evaluation using the actual target hardware, providing support for test automation.

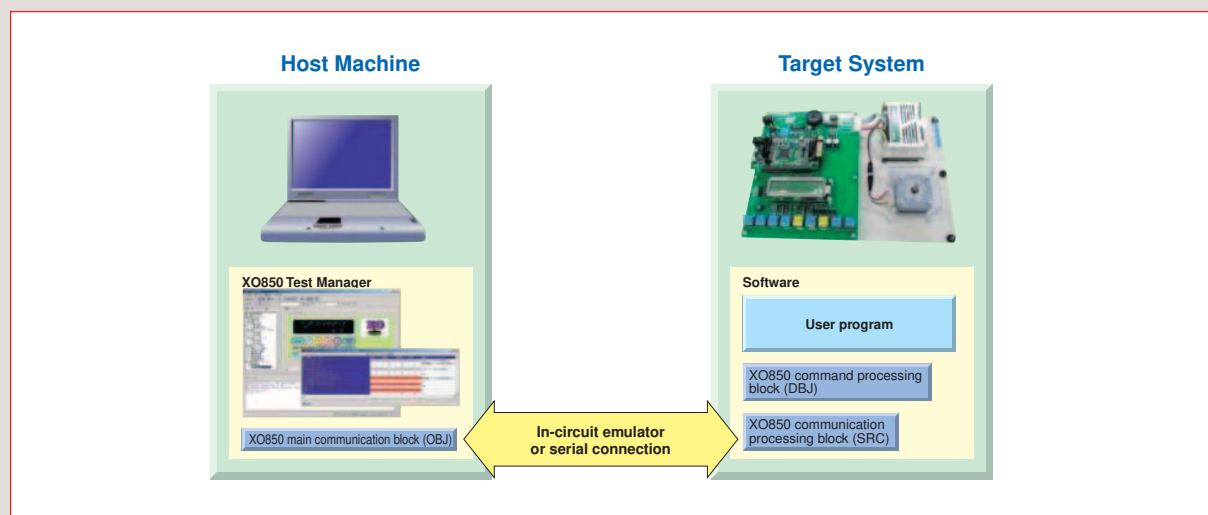
Features

- ◆ Improved execution of tedious repetitive and regression tests
Full testing after each software revision is tedious and time-consuming. Test automation enables regression tests to be performed more easily, for improved software quality.
- ◆ Executes tests that are too complex or too large to be executed manually.
With the advent of ever more complex software, an increasing number of tests are endurance tests or other tests too complex for manual operation. Test scripts can be used to enable implementation of abnormality-related tests or other complex tests, and it saves time when implementing very large tests.
- ◆ Facilitates reproduction of abnormalities
When an abnormality is discovered, it is often difficult to remember the execution steps that preceded the abnormality. Test automation includes recording these execution steps, which facilitates and helps ensure accuracy when reproducing the abnormality.

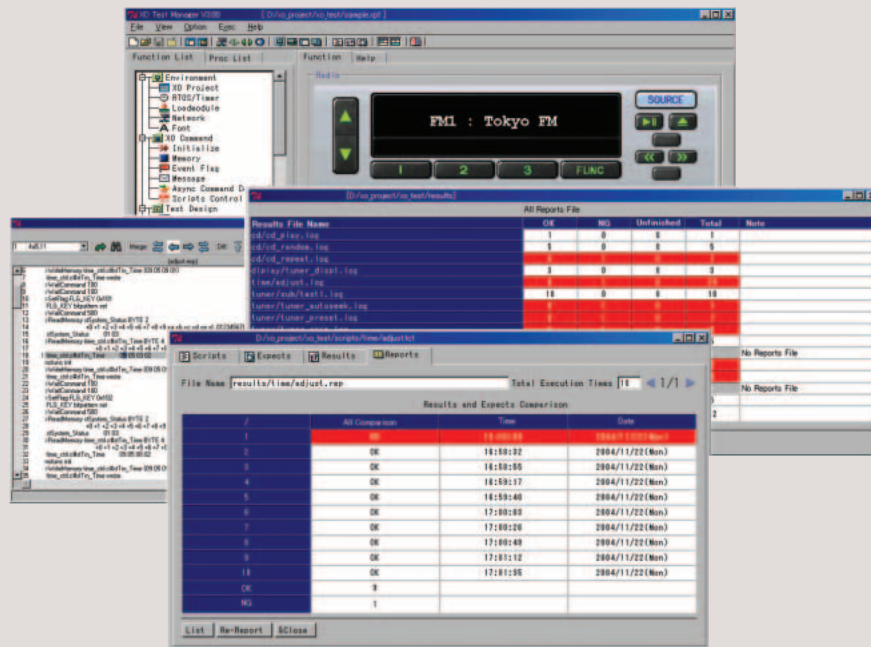
Configuration

Tests are performed using a host machine connected to the target system.

The XO850 Test Manager, which is installed in the host machine, manages the tests by executing the tests, gathering the test results, automatically comparing the test results to the expected values, etc.



XO850 Test Manager (screen example)



Functions

- ◆ Support for creating test scenarios
 - Auto generation of test scenarios from virtual target's operations
 - Auto generation of test scenarios from actual device's operations
- ◆ Auto execution of test scenarios
 - Enables execution of multiple test iterations or multiple consecutive test scenarios
 - Enables execution of test scenarios concurrent with condition judgments
- ◆ Auto comparison of execution results and expected values
 - When execution of test scenario ends, the pass/fail results are automatically displayed in a readable format.
 - Displays a report describing the execution conditions for all test scenarios
- ◆ Use of upstream resources
 - Verification logs from design stages can be used to make test script generation more efficient.
 - Analysis of abnormalities found during testing is facilitated by links to a status transition table.
 - Coverage can be viewed at the status transition table level, enabling confirmation of a test's coverage.

Use Conditions

- ◆ Load module

The load module is generated by the V850 Series' C compiler package (CA850). The RX850 and RX850 Pro real-time operating systems for the V850 Series are also supported when the real-time OS is used.
- ◆ Communication tools

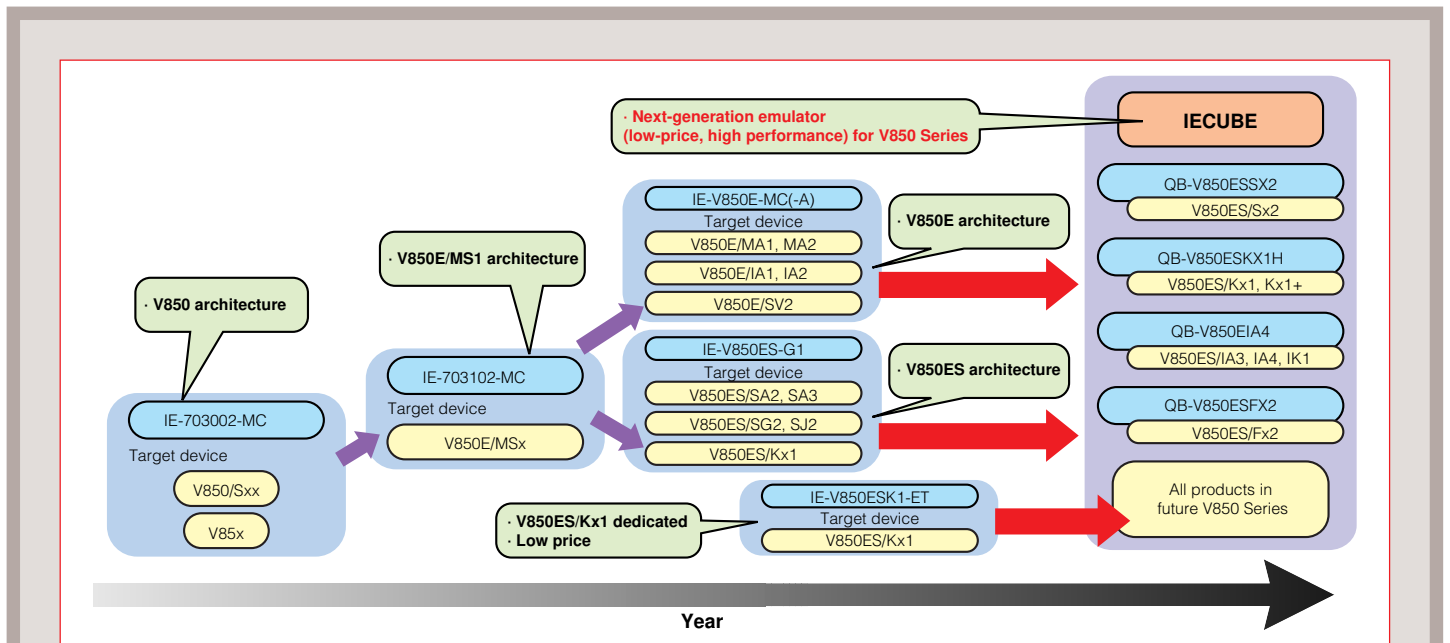
One of the following is required for communications between the host machine and the target device.

 - One serial communication channel for the device
 - An in-circuit emulator (IE-703002-MC, IE-703102-MC, IE-V850E-MC, IE-V850E-MC-A, IE-V850ES-G1, or QB-V850ESSX2)

IECUBE SERIES

The following IECUBE series in-circuit emulators are supported in the V850 Series.

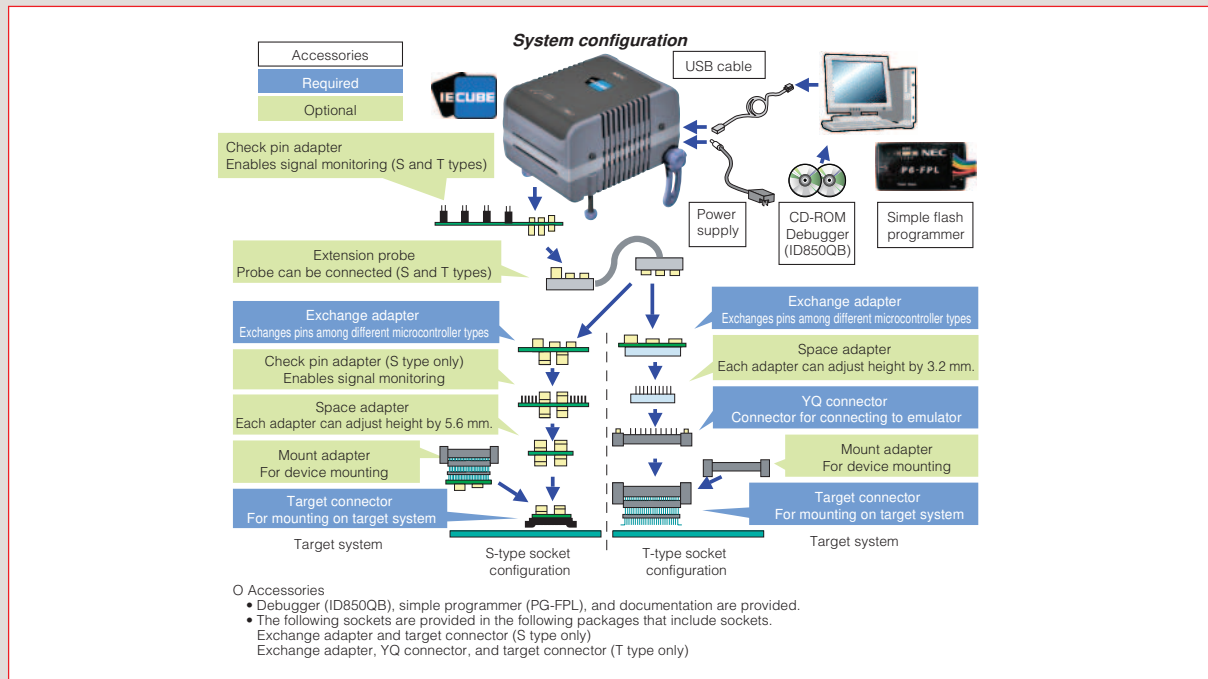
- QB-V850EIA4: In-circuit emulator for V850ES/IK1, V850E/IA3, or V850E/IA4
- QB-V850ESSX2: In-circuit emulator for V850ES/SG2 or V850ES/SJ2
- QB-V850ESKX1H: In-circuit emulator for V850ES/KE1, V850ES/KE1+, V850ES/KF1, V850ES/KF1+, V850ES/KG1, V850ES/KG1+, V850ES/KJ1, or V850ES/KJ1+
- QB-V850ESFX2: In-circuit emulator for V850ES/FE2, V850ES/FF2, V850ES/FG2, V850ES/FJ2, or μ PD703229



Features

- ◆ Low price
 - Price of 1/3 to 1/4 of the existing high-performance emulators
 - Debugger "ID850QB" and simple programmer "PG-FPL" are available as a package.
- ◆ Easy setup
 - Emulator and emulation board, which have conventionally been available separately, are combined.
 - USB (1.1/2.0) is employed for communication with the host machine.
- ◆ Many debugging functions
 - Functions equivalent to a high-performance emulator are realized (coverage and external memory emulation are optional).
 - Time measurement function as well as real-time monitor and RAM monitor functions that are frequently used are reinforced.
- ◆ Reinforced maintainability
 - Self-diagnostic function is provided to smoothly solve troubles.
- ◆ Small and lightweight
 - Palm size for easy transportation





◆ IECUBE optional functions

The following functions are optionally available. They can be added by specifying an option when placing your order or by upgrading your IECUBE.

• Memory emulation function

This function substitutes the external memory on the target system so that programs and data can be located in emulation memory and debugged.

• Coverage measurement function

Percentage of executing load modules and sections can be measured.

• TimeMachine™ function

This function is supported by a Green Hills Software (GHS) debugger. Consult a GHS tool distributor for the outline and specifications of this function.

PG-FPL

The PG-FPL is a simple programmer that is supplied with IECUBE.

Features

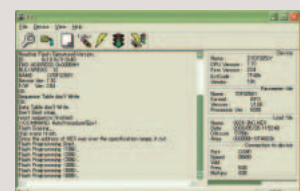
- ◆ Connects to a PC (via USB 1.1 or 2.0 cable), AC adapter not required.
- ◆ Write is also enabled via UART in the target device.
- ◆ Status display LEDs: power ON (green LED lit) and communication online (red LED blinking) display lamps
- ◆ Connection to target system selectable: via PG-FP4's connector or a direct connection
- ◆ Able to supply power to the target system (up to 200 mA)
- ◆ Not able to supply clock to the target system
- ◆ Evaluation programmer for development (conditionally guaranteed for use with mass production)
- ◆ Target devices: Any device supported by IECUBE (except flash memory versions that use two power supplies)



PG-FPL



Connection



GUI

Socket for IECUBE



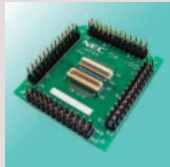
① Extension probe (S and T types) (option)
Connecting IECUBE to target system with probe



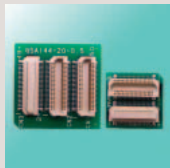
② Exchange adapter
Adapter whose pins need to be converted, depending on the product



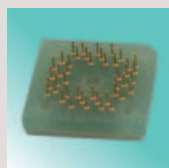
⑦ Exchange adapter
Adapter whose pins need to be converted, depending on the product



③ Check pin adapter (option)
Adapter for monitoring waveform



④ Space adapter (option)
Adapter for adjusting height



⑧ Space adapter (option)
Adapter for adjusting height



⑨ YQ adapter
Adapter for connecting IECUBE



⑤ Mount adapter (option)
Adapter for mounting device (cover and unit)



⑩ Mount adapter (option)
Adapter for mounting onto device



⑥ Target connector
Connector soldered onto the target system



⑪ Target connector
Connector to be soldered onto the target system

S-type socket

T-type socket

Connections

When Connecting to IECUBE	
S Type	T Type
IECUBE	
①	
②	⑦
③	—
④	⑧
	⑨
⑥	⑪
Target System	

When Mounting on Device	
S Type	T Type
⑤(top)	⑩
Device	
⑤(bottom)	—
⑥	⑪
Target System	

Remark The YQ adapter (T type) includes guide screws (YQGUIDE-S3).
The exchange adapter (S type) differs according to the G1 emulator.
A check pin adapter that can be used with both T type and S type is currently under development.
The following products are identical (except 64-pin products).
· Check pin adapter (S type) and check pin adapter for G1 emulator
· Space adapter (S type) and space adapter for G1 emulator
· Mount adapter (S type) and mount adapter for G1 emulator
· Target connector (S type) and target connector for G1 emulator
· Space adapter (T type) and YQSOCKET for MC emulator
· YQ adapter (T type) and YQPACK for MC emulator
· Mount adapter (T type) and HQPACK for MC emulator
· Target connector (T type) and HQPACK for MC emulator

G1 SERIES

The following products are G1 series in-circuit emulators for V850 Series.

IE-V850ES-G1: In-circuit emulator for V850ES

IE-703204-G1-EM1: In-circuit emulator emulation board for V850ES/SA2 and V850ES/SA3

IE-703288-G1-EM1: In-circuit emulator emulation board for V850ES/SG2 and V850ES/SJ2

IE-703228-G1-EM1: In-circuit emulator emulation board for V850ES/PM1

IE-703239-G1-EM1: In-circuit emulator emulation board for V850ES/FE2, V850ES/FF2, V850ES/FG2, V850ES/FJ2, μ PD703229Y

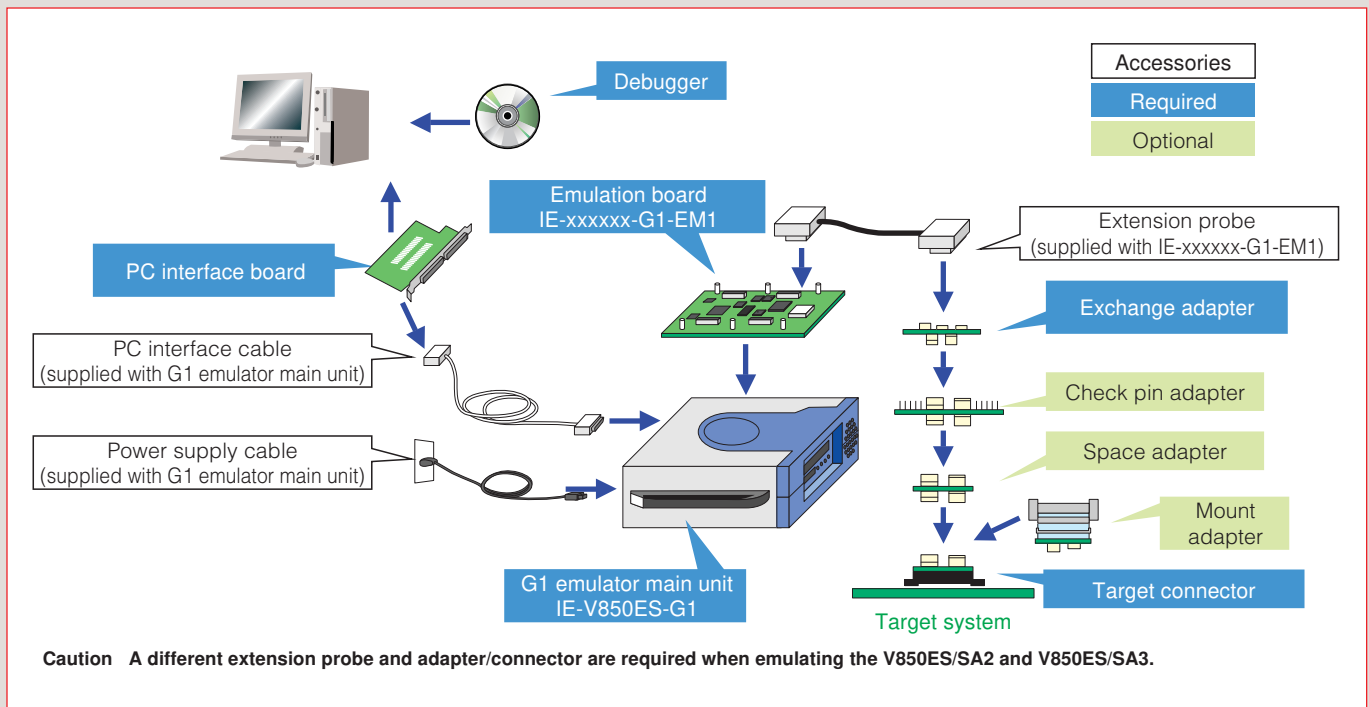
IE-703220-G1-EM1: In-circuit emulator emulation board for V850ES/ST2



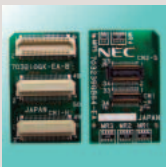
IE-V850ES-G1

Features

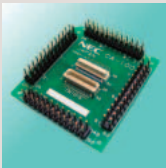
- ◆ Attains a high approximation of an actual device by integrating emulator functions on a dedicated chip.
- ◆ Provides many debugging functions such as break, trace, coverage measurement, external memory emulation, and real-time RAM monitoring.
- ◆ Extension probe supplied as standard makes connection with the target system easy.
- ◆ Internal power supply and easy-to-carry housing
- ◆ Connectable to various types of computers.



Socket for G1 Emulator



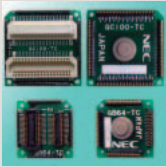
② Exchange adapter
 Adapter whose pins need to be converted, depending on the product



④ Check pin adapter (option)
 Adapter for monitoring waveform



⑤ Space adapter (option)
 Adapter for adjusting height



① Target connector
 Connector to be soldered onto the target system

Connections

When Connecting to Emulator	When Mounting on Device
Emulator	③ (top)
②	Device
④	③ (bottom)
⑤	①
①	Target system
Target system	



③ Mount adapter (cover and unit)
 Adapter for mounting onto device

Remark The exchange adapter differs from the exchange adapter for IECUBE (S type). The following products are identical, although the product names are not the same (except 64-pin products).

- Check pin adapter and check pin adapter for IECUBE (S type)
- Space adapter and space adapter for IECUBE (S type)
- Mount adapter and mount adapter for IECUBE (S type)
- Target connector and target connector for IECUBE (S type)

MC SERIES

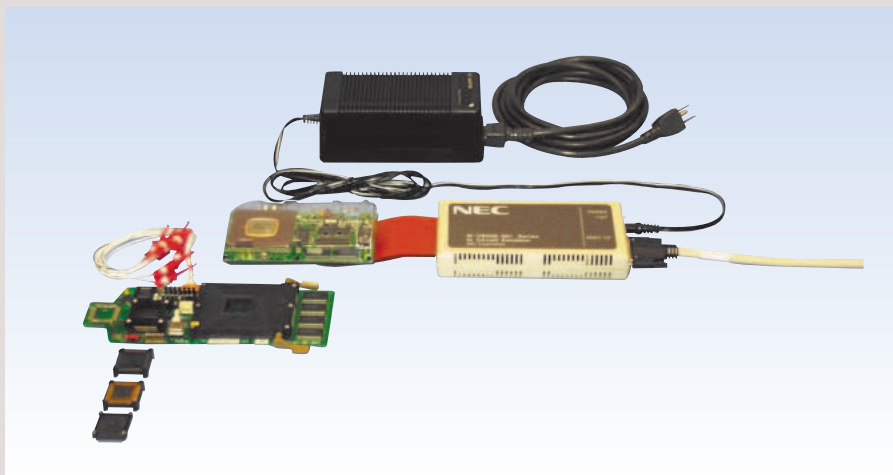
The following products are MC series in-circuit emulators for V850 Series.

- IE-703002-MC: In-circuit emulator for V85x, V850/Sxx
- IE-703003-MC-EM1: In-circuit emulator option board for V853
- IE-703017-MC-EM1: In-circuit emulator option board for V850/SA1
- IE-703037-MC-EM1: In-circuit emulator option board for V850/SB1, V850/SB2
- IE-703040-MC-EM1: In-circuit emulator option board for V850/SV1
- IE-703079-MC-EM1: In-circuit emulator option board for V850/SF1
- IE-703089-MC-EM1: In-circuit emulator option board for V850/SC1, V850/SC2, V850/SC3

- IE-703102-MC: In-circuit emulator for V850E/MS1, V850E/MS2
- IE-703102-MC-EM1: In-circuit emulator option board for V850E/MS1, V850E/MS2 (5 V type)
- IE-703102-MC-EM1-A: In-circuit emulator option board for V850E/MS1 (3.3 V type)

- IE-V850E-MC: In-circuit emulator for V850E (5 V type)
- IE-703116-MC-EM1: In-circuit emulator option board for V850E/IA1
- IE-703114-MC-EM1: In-circuit emulator option board for V850E/IA2

- IE-V850E-MC-A: In-circuit emulator for V850E (3.3 V type)
- IE-703166-MC-EM1: In-circuit emulator option board for V850E/SV2
- IE-703107-MC-EM1: In-circuit emulator option board for V850E/MA1, V850E/MA2
- IE-V850E-MC-EM1-A: In-circuit emulator core adapter for NB85E core (2.5 V type)
- IE-V850E-MC-EM1-B: In-circuit emulator core adapter for NB85E core (3.3 V type)



IE-703002-MC
 IE-703102-MC
 IE-V850E-MC
 IE-V850E-MC-A

Features

- ◆ Integration of conventional emulator functions in a single chip enables considerable penetrability
- ◆ Rich variety of emulator functions
- ◆ High-speed operation equivalent to the target device
- ◆ Connectable to a variety of PCs