

**SH70xx-MICRO-MODULE  
WITH HITACHI SH70xx  
32-BIT SINGLE-CHIP-MICROCOMPUTER  
(SH7032, SH7034)**

The SH70xx-MICRO-MODULE is a fieldprogrammable miniature-controller-module implementing a powerful HITACHI 32-bit single-chip-microcomputer with modern RISC architecture. It supports fast and easy development of a large variety of automation- and communication-applications, including applications that require frequent reprogramming, network features or interprocessor communication, while occupying minimal space.

The on-board operating-system has some powerful debug-features that make the SH70xx-MICRO-MODULE a first-choice-component for development, prototyping and production. An optional IC-adapter converts the SH70xx-MICRO-MODULE to a small In-Circuit-Emulator.

We supply a macro-library, demo-programs, a PD-macro-cross-assembler (free of charge) and a special download-cable with each SH70xx-MICRO-MODULE DEV.-KIT.

**APPLICATION:**

industrial equipment  
robotics  
communication and measuring instruments  
real-time data-processing equipment

**FEATURES:**

small outline: app. 64 x 48 mm  
on-board operating-system  
5 Volt-operation  
up to 1MB flash-EPROM, 5 Volt field-programmable (no external 12 V required)  
sector erase functions (the flash-memory is divided into 8 sectors)  
127 SH70xx-MICRO-MODULES can be connected to a network via RS485 and can be (re)programmed in network  
external memory can be expanded up to 42 MB (SRAM, DRAM, multiplexed)  
on-chip DMA-controller  
on-chip DSP function  
40 I/O-pins  
16-bit integrated timer pulse unit (ITU), timing pattern controller (TPC) for motor control  
8 x 10-bit A/D-converter, 2 fast USARTS (SCI)

**OPTIONS:**

- 256 KB or 1 MB field-programmable flash-EPROM
- 12, 16, 20 MHz clock-frequency
- full speed option: external on-board memory can be accessed with minimum wait
- QFP-socket: SH-chip can be exchanged; can be used as a target board for an ICE

**TECHNICAL DATA OF SH7000-CHIP-FAMILY:**

high performance 20MIPS 32-bit RISC-CPU (one instruction/cycle)  
4-Gbyte virtual address-space (external memory expansion up to 42 Mbyte)  
fastest instruction: 50 ns at 20 MHz  
up to 8 Kbyte internal RAM (SH7032)  
up to 64Kbyte internal ROM (SH7034)  
on-chip direct-memory-access-controller (DMAC), 4 channels  
40 programmable I/O-pins (32 I/O + 8 Input)  
31 internal- + 9 external interrupt-sources at 16 programmable priority-levels  
2 USARTS (Universal Synchronous/Asynchronous Receiver/Transmitter),  
> 3 MBps synchronous data-transmission at 20 MHz  
16-bit integrated timer pulse unit (ITU), 10 waveforms, PWM  
timing pattern controller (TPC), 16-bit output (4 x 4 channels) for motor control  
on-chip 16 x 16-bit DSP function  
8 x 10-bit A/D-converter  
programmable watchdog-timer

**TECHNICAL DATA OF SH70xx-MICRO-MODULE:**

clock-frequency: 8/16/20 MHz (versions faster than 20MHz upon request)  
5 V voltage-controller and supervisor (3,3 Volt versions upon request)  
resetbutton  
power-on-reset, power-down-reset  
I/O-connector for 40 I/O-pins  
bus-connector for complete memory-area (24-bit address, 16-bit data, 4-bit chip select)

**COMMUNICATION:**

on-board RS-485 up to 150 Kbps (special versions for up to 625 Kbps available)  
up to 128 network-members

**MEMORY:**

8 Kbyte RAM  
256Kbyte or 1Mbyte field-programmable sector-erase flash-EPROM (16-bit data bus)  
no external 12 V supply required

**OPERATING SYSTEM:**

located in sector-0 of the flash-EPROM  
features highspeed-download of the User-Software  
supports multiple applications  
monitors memory and register contents  
supports network programming  
supports auto-start-application functions  
debug features: break on instruction fetch, break always (single step), break on data access  
plus additional break conditions supporting memory-compare in byte, word, and long

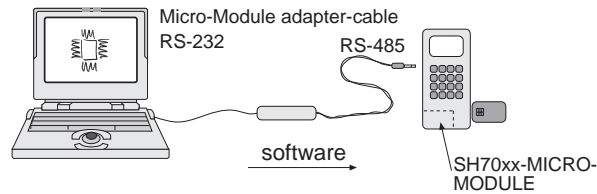
**DEVELOPMENT-ENVIRONMENT-SOFTWARE „LUCILLE-32“:**

perfectly adjusted to our CPU-boards and MICRO-MODULES  
see extra data-sheet for details

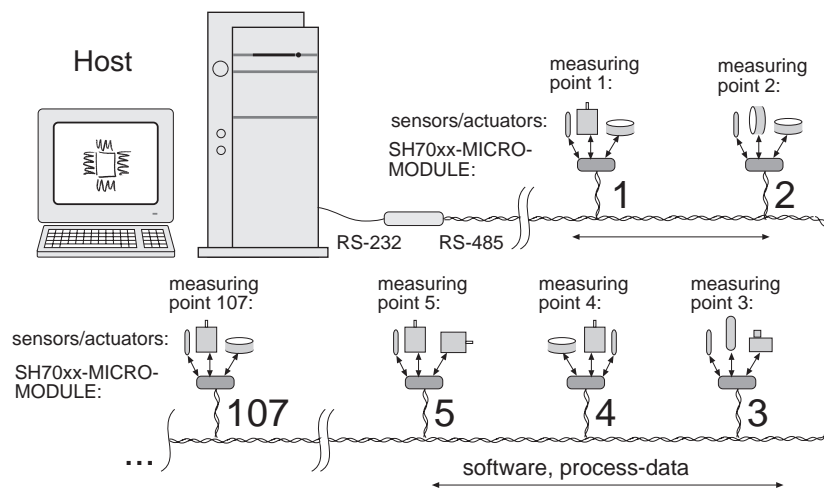
**INTERFACE-CABLE:**

the special MICRO-MODULE adapter cable is used to connect the PC RS-232 port to a single MICRO-MODULE or to a MICRO-MODULE-network.

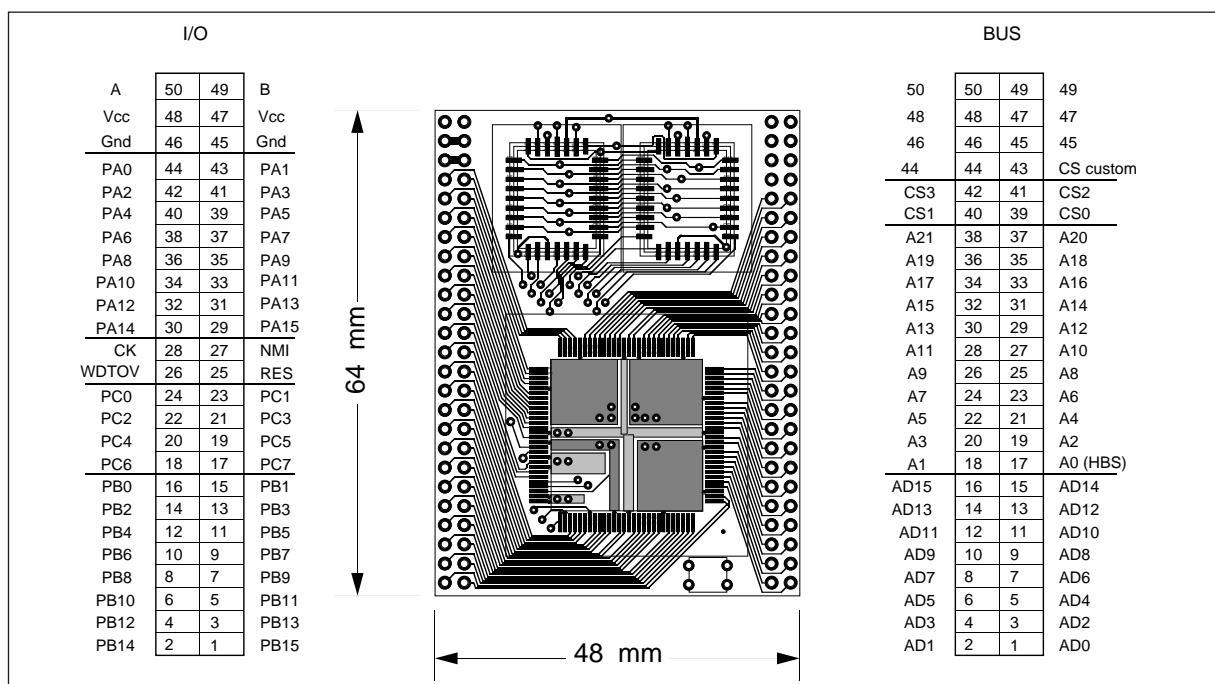
## Application 1: firmware-download to stand-alone instrument or prototype



## Application 2: measuring-/control-system with permanent host-connection



SH70xx-MICRO-MODULE application example



SH70xx-MICRO-MODULE pin configuration