M68SMASM

Product Profile
Assembly Language Toolset for Microcontrollers

Motorola offers an assembly language development toolset that supports the M68HC05, M68HC08, M68HC11 and M68HC16 microcontrollers. These tools provide a path to higher performance while maintaining compatibility with existing software and systems. The tools include: an assembler (masm), linker (ld), Motorola S-record generator (hex), assembly language converter (i2m), symbol table dump utility (nm), map file generator (mlst2map), conversion utility to support the CDS805 (coff2cds), and symbol table reduction tool (strip). This toolset operates under DOS on IBM PC and 100% compatible machines which contain an Intel 80386 or higher microprocessor.

Features include:

- Relocatable or absolute object modules
- Switch selectable processor support
- Full instruction sets
- Common syntax and extended instructions to ease upward migration
- All available addressing modes
- Full macro capability with nesting
- Include file support that allows nested include files
- Linking of multiple source files
- Optimization of long and short branches
- Generation of Motorola S-records
- 128 character symbol names
- Partial linking
- Common Object File Format
- User-controlled assembly listings
- Cross reference listings
- Symbol table listings
- User-selectable case sensitive labels
- Motorola's Assembly Language Input standard is based on MASM
- Works with existing CDS805 hardware and software
- Works with existing MMDS05, MMDS08 and MMDS11 hardware and software and will work with planned upgrades
- User-selectable option to minimize the size of the symbol table to decrease download time
- Absolute listings available after relocation
- Creation of map files

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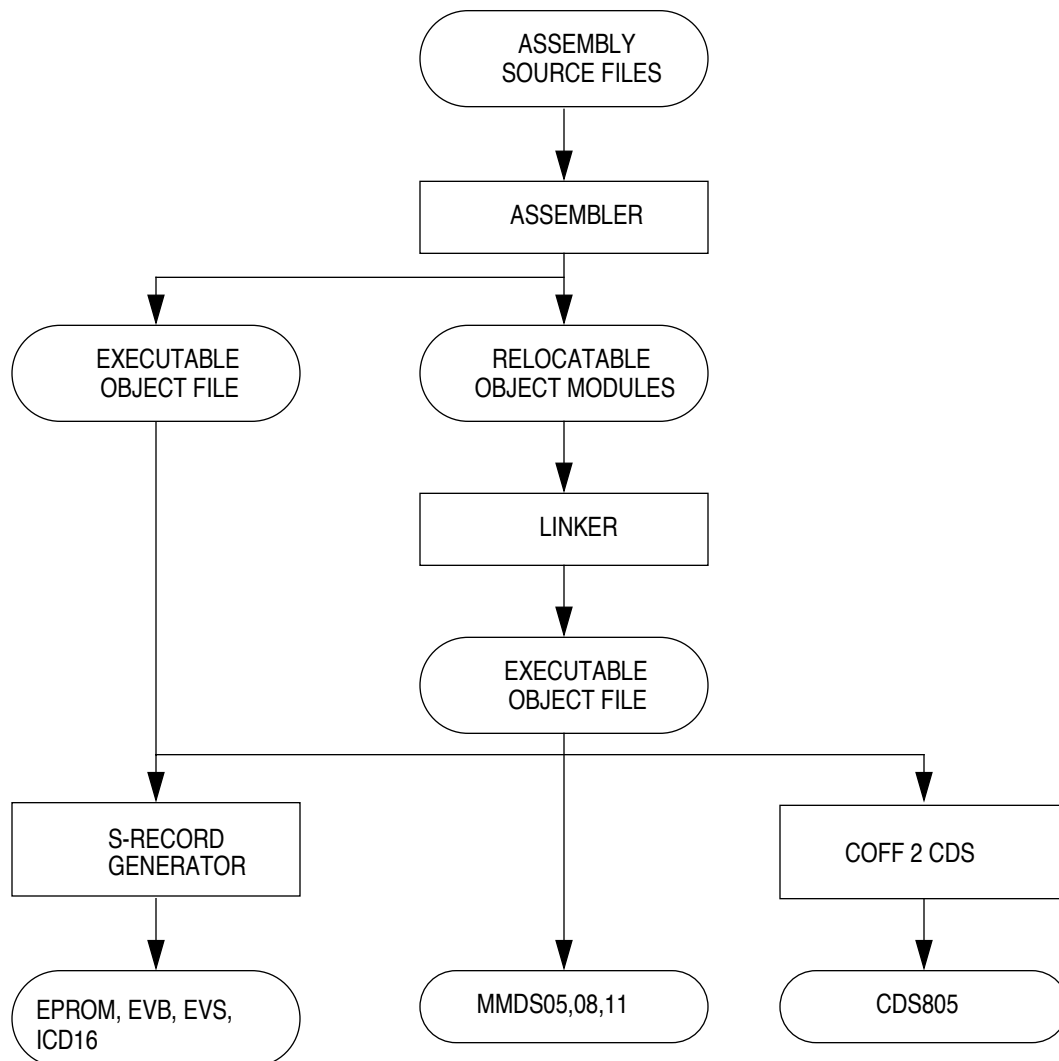
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The Assembly Language Development Toolset comes in a shrink-wrapped package that includes:
- User's Manual
- Release Guide
- License Agreement
- One 3.5 inch DSHD disk (1.44 Mbyte)

The release guide includes phone and fax numbers and an Internet address for technical support.

Software

Many controller applications are severely limited by the cost of additional memory components or by timing constraints, therefore, they cannot take advantage of the benefits offered by high-level languages. Other applications which use high-level languages often need the speed, access to special instructions, and unique memory optimizations that are available only through low-level languages, such as Motorola's macro assembler. This toolset provides capabilities to engineer solutions to these problems.

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           ┌─────────────────┐
           │    ASSEMBLY     │
           │  SOURCE FILES   │
           └────────┬────────┘
                    │
           ┌────────▼────────┐
           │    ASSEMBLER    │
           └───┬─────────┬───┘
               │         │
    ┌──────────▼──┐   ┌──▼──────────────┐
    │ EXECUTABLE  │   │   RELOCATABLE   │
    │ OBJECT FILE │   │ OBJECT MODULES  │
    └──────┬──────┘   └────────┬────────┘
           │                   │
           │          ┌────────▼────────┐
           │          │     LINKER      │
           │          └────────┬────────┘
           │                   │
           │          ┌────────▼────────┐
           │          │   EXECUTABLE    │
           │          │  OBJECT FILE    │
           │          └──┬──────┬────┬──┘
           │             │      │    │
    ┌──────▼──────┐      │   ┌──▼──────────┐
    │  S-RECORD   │      │   │  COFF 2 CDS │
    │  GENERATOR  │      │   └──────┬──────┘
    └──────┬──────┘      │          │
           │             │          │
    ┌──────▼──────┐  ┌───▼──────┐ ┌─▼────────┐
    │EPROM,EVB,EVS│  │MMDS05,08,│ │ CDS805   │
    │ICD16        │  │11        │ └──────────┘
    └─────────────┘  └──────────┘
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Development Flow

For More Information On This Product,
Go to: www.freescale.com

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These tools place few restrictions on the application. Some examples of the freedom allowed are: symbol names up to 128 characters, 32 Kbyte symbols per source file, 256 sections, nested macros and nested include files to 256 levels, and evaluation of all expressions using 32-bit arithmetic.

With the linker, a user arranges program sections to fit into physical memory. Sections can be contained in one or more files facilitating rapid development and debugging. A user-defined directive file instructs the linker where to place these sections. Additionally, the linker supports solutions to more advanced problems, such as, partial linking and source level debugging.

Individual microcontroller instruction sets and addressing modes are optimized for high performance. Motorola's macro assembler supports the instruction sets of all our controllers with a common syntax and with language extensions that ease the upward migration path without sacrificing any of the speed or efficient memory utilization benefits that assembly language provides.

ASSEMBLER DIRECTIVES

Assembly Control

BASE	— Sets default number base
END	— End of source program
FAIL	— User generated warning or error
INCLUDE	— Include secondary file
ORG	— Sets location counter

Macros and Conditional Assembly

ELSEC	— Assemble when IFcc is false
ENDC	— End conditional assembly
ENDM	— End macro definition
IFcc	— Conditional assembly
MACRO	— Macro definition
MEXIT	— Exit macro

Data Definition/Storage Allocation

ALIGN	— Aligns data or code in memory
DC	— Allocates initialized storage
DCB	— Allocates initialized memory block
DS	— Reserves uninitialized memory
EVEN	— Align to next word address
LONGEVEN	— Align to next longword address

Symbol Definition

EQU	— Equate symbol to a value
SECTION	— Start section
SET	— Set symbol to a value
XDEF	— External symbol definition
XREF	— External symbol reference
XREFB	— External byte reference

Listing Control and Options

CLIST	— Controls conditional assembly listing
LIST	— List the assembly
LLEN	— Sets length of listing line
MLIST	— Controls macro listing
NOLIST	— Stop assembly listing
NOPAGE	— Disables pagination in listing
PAGE	— Advance to next page
PLEN	— Sets page length
SPC	— Insert blank lines in listing
TABS	— Sets the tab length
TTL	— Sets the title

Host Requirements

- This version of the MASM Toolset is intended for use on IBM PCs which contain an Intel 80386 (or higher) microprocessor running DOS 5.0 or higher. 100% compatible systems may be used as well. 640 Kbyte of conventional memory is required. Extended memory is recommended. 2 Mbyte of disk storage are needed to install the complete toolset.

Technical Support Information

- Telephone Support: 512-891-6276
- FAX Number: 512-891-2720
- Internet Address: masm@devmail.sps.mot.com

Ordering Information

Motorola's assembly language development toolset can be obtained through a local Motorola Semiconductor Sales Office or authorized dealer.

PRODUCT	HOST	PART NUMBERS
MASM	IBM PC	M68SMASMAB

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