

Summary

The DM1000 is a highly flexible full-duplex interface processor with integrated IEEE 1394b-2002 link layer controller, supporting both 1394a-2000 and the IEEE 1394b-2002 standard PHYs.

The chip features unsurpassed interface flexibility, perfectly matching the audio and video system requirements of professional and consumer applications, including DTCP (5C) copy protection.

The IEC 61883 Framer supports IEC 61883-1...6 compliant streams and allows multiple input and output streams at the same time.

A powerful ARM9 system manages all system related tasks using BridgeCo's application software (such as kernel, interface drivers including 1394, TCP/IP, audio processing modules), thus greatly reducing customer development effort.

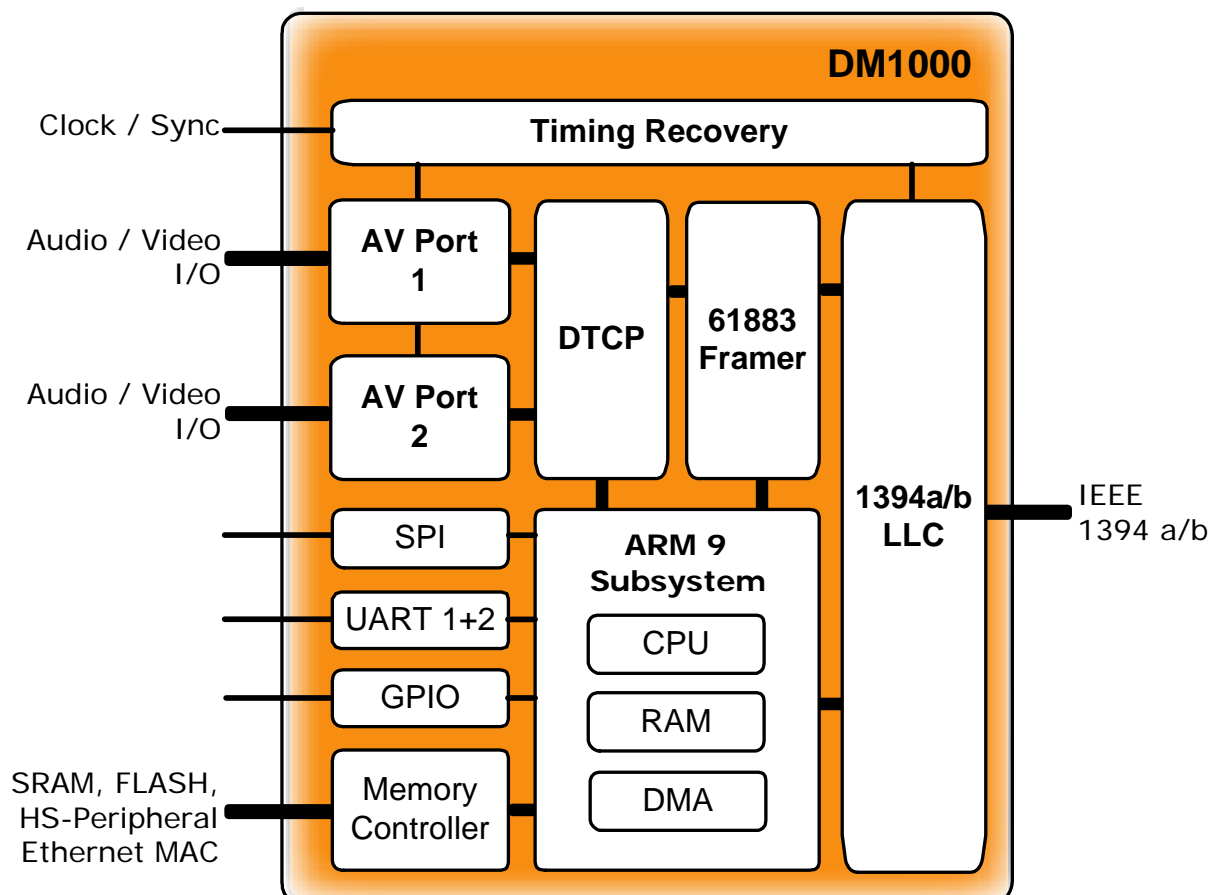
Flexible control interfaces such as SPI, two on-chip UARTs and a fast memory port simplify system design and enable low-cost adaptable system solutions without trading flexibility for performance.

The DM1000 supports the forthcoming IEEE p1394.1 bridging standard with adjustable cycle master capabilities, thereby offering cost-effective solutions from simple plug-n-play connectivity to large synchronous audio and video networks.

Target applications include AV-receivers, digital active loudspeakers, jukeboxes, audio breakout boxes, digital audio receivers, mixing consoles, digital audio transmission equipment, IEEE 1394.1 bridges and Ethernet/1394 bridges.

The DM1000 is powered by a 3.3V I/O and 1.8V core supply and comes in a small PQFP128 package.

With 100 MIPS performance, large external program/data space, and a well-defined API the DM1000 enables a simple yet powerful system approach.





DM1000 Chip Overview

- On-board 32-bit ARM946 RISC with DSP enhancements running at 100 MHz
- IEEE 1394b-2002 compliant link layer controller
- IEEE 1394a-2000 and IEEE 1394b-2002 PHY support
- IEEE p1394.1 draft 1.0 bridge awareness and bridge portal capability
- Operates at S800, S400, S200 and S100
- Optional PHY/link interface isolation barrier
- Network-wide AV synchronization based on either CSP or timestamps
- IEC 61883-1...6 compliant stream support
- Support of up to 63 isochronous channels
- System and interface expansion through memory interface
- Two highly flexible audio/video (AV) ports
- Fully integrated DTCP copy protection with secure key storage
- CPU access to both 1394 isochronous channels and AV ports

The DM1000 Datasheet is available from BridgeCo on request.

RISC Features

- ARM946 with 4kByte data & 4kByte instruction cache, running at up to 100MHz
- 16kByte tightly-coupled instruction RAM
- 8kByte tightly-coupled data RAM
- 80kByte multiple-purpose RAM
- 8 channel DMA controller
- Fast 32-vector interrupt controller
- 32-bit SRAM memory/high speed peripheral interface:
 - Up to 50MHz
 - Up to 4 x 32 MBytes address range

Audio Features

- Low-jitter clock recovery
- Each AV port offers any of the following audio formats:
 - 8 x I²S, 8 x I⁸S, 8 x SPDIF
 - 1 LinkPort for SharcTM DSPs
- 6 channel DSD plus ancillary data
- Supports:
 - Full C/U-bit transparency for SPDIF transfers
 - Format conversions between I²S/I⁸S and SPDIF and vice-versa
 - 16/20/24/32-bit audio word length
 - Sampling rates of 32, 44.1, 48, 88.2, 96, 176.4, and 192kHz
- Enables:
 - AES-11 compliance across multiple chips
 - Full transparency of e.g. AES-3 or AES-10 (MADI) audio formats, including channel status

Video Features

- Standard 8-bit DVB-SPI compliant interface
- 8-bit uncompressed video streaming up to 216Mb/s
- Full-duplex MPEG-2 TS or DV
- Fully integrated DTCP copy protection

Control Features

- SPI master and slave host interface
- 2 on-chip UARTs for MIDI and remote control
- Up to a maximum of 20 General Purpose I/Os, typically 4 to 8 available



Kernel & OS

The Kernel & OS is the basic operating system for the DM1000 providing optimized usage of the DM1000 resources.

The Kernel & OS package builds on a high performance micro kernel operating system. The generic OS services have been extended with specific DM1000 services for memory management and thread creation, which greatly simplify keeping track of computing and memory resources. A secure mode version is optionally available for applications requiring higher levels of software intellectual property protection.

The Kernel & OS package is the underlying base of all applications running on the DM1000.

- Small and efficient real-time operating system
- Configuration & Eventing (CnE) system supporting FLASH storage
- Drivers for DM1000's 1394 interface, I/O drivers (SPI, UART), AV ports and I/O interfaces
- Support for 61883-6, I²S, I⁸S, SPDIF and Sharc[™]-Link-Ports
- 1394 driver including IEC 61883-1 (FCP, CMP)
- Multiplexing several audio streams on one 1394 iso-channel
- 1394 isochronous streaming I/O
- 1394 asynchronous transaction I/O
- 1394 bus management
- CMP connection management
- ANSI-C application programming interface
- Standard C/C++ Library

Application Framework

BridgeCo's Application Framework provides additional services to ease and accelerate customizing the application based on the Kernel & OS. The DM1000 Application Framework allows the DM1000 software option packages to be linked together without extensive programming effort, thereby reducing the time-to-market for customized solutions.

Development Options

BridgeCo Software Development Kit

The BridgeCo SDK offers a debugging environment enabling customers to extend the BridgeCo application software with their own applications as well as to customize the software for their specific hardware needs.

Evaluation Board EVM AUDIO1

The evaluation board EVM AUDIO1 allows customers to examine DM1000 hardware and the relevant application software. Together with the BridgeCo Software Development Kit (SDK) it allows customer to easily develop their own applications as well as to customize application software for their specific hardware needs.

Application Software

BridgeCo provides a variety of software options that include all functionality to build and operate a complete application on the DM1000. Several add-on options are available to configure your product.

Solutions and Reference Designs

Reference Designs for the DM1000 include:

- BridgeCo-enhanced Breakout Box (BeBoB)
- Loudspeaker (Multimedia, Wireless, Networked, Professional)
- CE Family (AVR- and DVD Player Networking)

For further information, please see the relevant Product Information brochure.



Ordering Guide

A basic package consists of the DM1000 IC and the Kernel & OS.

Additional software modules or different software combinations are available upon request.

Software License

All software delivered and used in conjunction with the DM1000 is covered by BridgeCo's software license.

Order List

Ordering Code	Description
Hardware	
BCOIC-DM1000-CQ	DM1000 Network and Signal Processor IC
Software	
BCOSW-KNOS-0230	Kernel & OS, Version 2.41 incl. Application Framework
Development Options	
BCOHW-EVMAUDIO1-0100-EVAL	Evaluation Board EVM AUDIO 1
BCOSW-SDK-0100-EVAL	Software Development Kit

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