

# Birdstep RDM Embedded 7

(formerly Raima Database Manager)

*optimized DATA MANAGEMENT in a small footprint database*



Birdstep's RDM Embedded 7.1 is a high performance, small footprint embeddable data management solution designed for today's complex, interconnected application-specific systems. RDM Embedded 7.1 provides developers with a high availability solution that enables information to be securely managed and interoperate with other systems. RDM Embedded is deployed in a broad range of applications within the telecommunication, defense and aerospace, financial and banking, automotive, and business automation markets.

RDM Embedded provides *rich database* functionality one would expect in a much larger database. With this functionality comes exceptional flexibility that developers can choose to optimize their system design.

The RDM Embedded API set includes *SQL, Native, XML, and Java* APIs that give the developer flexibility in optimizing their application interface with system performance.

RDM Embedded is based on the very *efficient* and *comprehensive* Network data model. The network model is proven to have the best performance when relating data that has a many-to-many relationship. RDM Embedded also supports the relational data model for more traditional data representation. These two models can be combined in RDM Embedded providing the best of both worlds – Birdstep's databases are the only databases that offer this capability.

Validated on General Purpose operating systems, RDM Embedded is available on Windows, Linux, Solaris, and HPUX; and Real Time operating systems, such as MontaVista Embedded Linux, QNX Neutrino, Green Hills Integrity, and Wind River VxWorks,

Administering the database is very easy. Database administration can be performed by the application via the API or by a remote user. With this capability the developer has unique options for database maintenance.

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## Key Features

**Dual Database Model Support:** RDM Embedded is based on the high performance and expressive network data model. It also supports the traditional, relational data model. Unique to RDM Embedded is its capability to combine the network and relational data models giving developers the advantages of both models.

**Comprehensive Data Modeling:** Embedded databases are used in application specific systems where it is important to accurately express the data relationships. RDM Embedded uses a C-based Database Definition Language (DDL) that is used to define all of the data relationships to the degree of detail needed by the developer.

**Multi-User Support:** In many cases, developers need to have multiple applications, or instances of an application, access a database while maintaining data integrity. RDM

Embedded supports multiple users whether they are multi-tasking, multi-threading, or accessing over the LAN. With locking and transaction processing features, RDM Embedded ensures data integrity through managed control and record keeping.

**Data Integrity:** Transaction Processing, File Locking, and Database Mirroring are key features within RDM Embedded to ensure the data integrity essential for multi-users and database recovery.

**Transaction Processing** maintains the logical consistency of a database by allowing multiple, related updates to be grouped together and then written to the database as a unit.

**File Locking** is applied before shared data is updated, so that other users cannot update the locked data.

format or into an XML format commonly used in web services applications.

**High Availability:** RDM Embedded has unique features that make it ideal for fault tolerant systems needing high availability data. Used individually, or together, these features provide the necessary functionality for developers to create high availability systems.

The RDM Embedded ***Mirroring System*** is an integrated, engine-level solution for mirroring main database modifications to a single mirror copy of that database. This powerful feature is used extensively in high availability applications.

Using RDM Embedded's ***Multiple Database Access*** functionality, applications can use a single transaction to access multiple database files. This feature can also be used by a single application to read from multiple database files.

***Automatic Database Recovery*** ensures, at startup, all committed transactions are applied to the database files prior to any other operation.

**Development Utilities:** Rapid and simple development is made possible by RDM Embedded's rich set of database utilities. Among the many utilities are the Interactive Database Access (*ida*) utility, Database Consistency utility, and the Import/Export Utility.

The ***Interactive Database Access (ida)*** utility is a menu driven utility that provides access to a database for creating, modifying, testing and deleting data.

The ***Database Consistency*** utility (*dbcheck*) is used to validate the integrity of the database. The optional ***Import/Export*** utility is used to import or export a complete database into the common ASCII

**Easy Application and System Integration:** Application integration is simplified by RDM Embedded's interfaces. Using industry standard API's, RDM Embedded can be embedded within C/C++, Java, and SQL based applications.

Integrating an application within an existing infrastructure requires the application to operate with existing application systems, which may be using different data management technology. With the addition of ***XML***, RDM Embedded simplifies the integration of the application.

**Native API:** RDM Embedded includes over 150 C-based functions available to the application for complete database control.

**SQL API:** SQL is a common database query language often used for its simplicity. RDM Embedded has implemented a SQL API set to support applications that manage the database through SQL commands.

**JAVA API:** The Java API is based on Java Native Interface (JNI) technology. By an extended C API to the Java programmer via the JNI, RDM Embedded lets you organize and access information efficiently, regardless of the complexity of your data. This combined technology provides tremendous speed advantages, and minimizes data redundancy.

**XML API:** XML is an emerging standard used by web appliances and systems to facilitate easy data transfer between disparate systems. RDM Embedded XML import/export layer allows for import and export of well-formed documents with or without DTDs or XML Schema.

### Database Specifications

- **Maximum Databases Open Simultaneously: limited only by computer memory**
- **Maximum Fields Per Record: limited only by maximum record size and available memory**
- **Maximum Files Per Database: 256**
- **Maximum Key Size: 242 Bytes**
- **Maximum Objects Per Database: 4,294,967,040**
- **Maximum objects Per File: 16,777,215**
- **Maximum Record Size: 32 KB**
- **Memory Requirements starting at: 270K (depending on operating system and features).**

### Operating Systems Supported

- **Linux 8.0**
- **MontaVista Embedded Linux**
- **QNX Neutrino 6.2**
- **Solaris 8**
- **Solaris 9**
- **Solaris 10**
- **VxWorks 5.4**
- **VxWorks 5.5**
- **VxWorks 6.2**
- **Windows 2000 / XP Embedded / XP Pro**
- **Green Hills Integrity v4.0.9b**