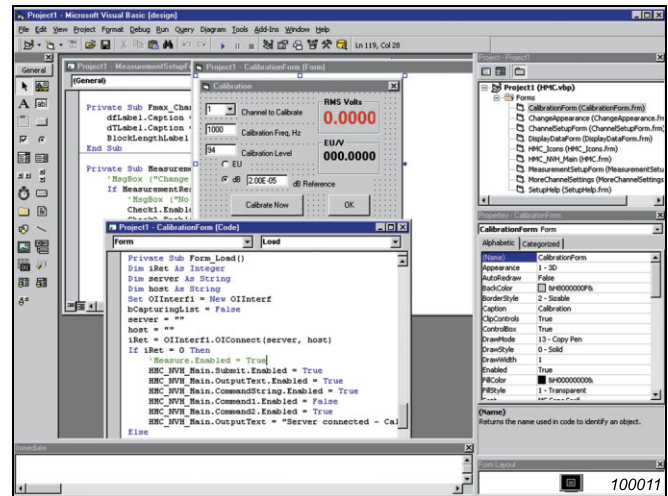


PRODUCT DATA

Test for I-deas Visual Basic Open Interface — BZ-6023

Poorly-integrated engineering tools can make your work life miserable and keep your projects from reaching their potential efficiency.

Brüel & Kjær recognises this problem as one that suppliers must aggressively solve to be recognised as a premier total solutions partner in today's accelerating, integrated world. And we also recognise that solutions can't be just a "one-size fits all" answer – you need the right tool for the right job. Thus we offer you a broad range of utilities and tools for our Test for I-deas noise and vibration products to help solve your integration problems. Our solutions range in scope from simple tools like macro recording to TCL and APIs for Microsoft® Visual C++® development. In this product datasheet, we explain these tools and some philosophies about why we offer them to you and how you can use them.



Uses and Features

Uses

- Advanced technology application wizards available which work with all Test for I-deas software
- Quickly and easily tailor the tool to meet your job needs, improving task performance and satisfaction with the software tools
- Easier learning, especially if you are new to Test for I-deas – looks and acts like other Windows®-based applications

- Simpler and faster way to develop maintainable custom solutions
- Increases your task and job satisfaction

Features

- Instrument control
- PC-based digital signal processing
- Live displays for basic scope
- Spectrum and order analyses for testing stationary and transient systems

What You Get with Test for I-deas

- Intuitive, convenient NVH application toolbars focused on specific noise and vibration testing and data analysis tasks
- The broadest scope of noise and vibration application functionality in the industry. Unobtrusive, but there when you need it
- Tightly integrated with SDRC[®]'s industry-leading CAD and FEA solutions when and if you need them
- Application wizards that guide you through unfamiliar tasks
- Exclusive ActiveDocuments – live graphs and animations in your test and analysis reports, viewable even by co-workers without Test for I-deas
- Capture and re-use keystroke and mouse action macros for repetitive tasks
- Completely native Windows[®]-based user interface that allows full customisation of layout, user-defined commands, toolbars, and pull-down menus
- Adaptable user interface, perform measurements using either Test for I-deas “classic” interface, the Windows[®]-based interface, or something in-between. Combining the Windows[®]-based interface with a traditional Test for I-deas layout is very helpful for users familiar with Test for I-deas
- Use our Visual Basic Open Interface with Microsoft[®] Visual Studio (Visual Basic[®], Visual C++[®], etc.) for complex, proprietary, or more detailed process automation projects
- Customisations work with all versions of Test for I-deas
- Compatible with Microsoft[®] Office features such as cut-and-paste to Word and PowerPoint[®], analysis in Excel[®], and more
- Customise and save your personalised user interface to industry-standard XML file formats
- Available on Windows NT[®] and Windows[®] 2000

Description of Test for I-deas

Brüel & Kjær has been serving noise and vibration engineers for a long time, offering the widest range of features for noise and vibration data collection, analysis, and results communication of any company serving the market. One of the challenges we face in producing features is figuring out how to present them to you and successfully integrating them in your work process. How do we bring such a wide range of functionality to you, in a simple and intuitive way? Embedding characteristics from the Microsoft[®] Windows[®] platform together with the best from the Test for I-deas platform, Test for I-deas presents a new standard in easy-to-use user interfaces.

Providing Ease of Use with Noise and Vibration Analysis Tools

Are you a new user, a reasonably experienced user, or a noise and vibration expert? No matter who you are, you will find things in Test for I-deas that will strongly appeal to you. It evolves with you as your needs grow. Simplicity in the beginning, then new or more advanced functionality when you need it – all just a mouse click away. User-customisable toolbars, new application toolbars, and a wide range of expanded functionality: You decide the range of functionality to absorb. With Test for I-deas customisation options, you are allowed to integrate the functionality tools the way you want them. Test for I-deas is the way to make your professional life as fun and rewarding as possible.

Fig. 1
 Configure Test for I-deas to run in "classic" interface, Windows®-based interface or customise your own

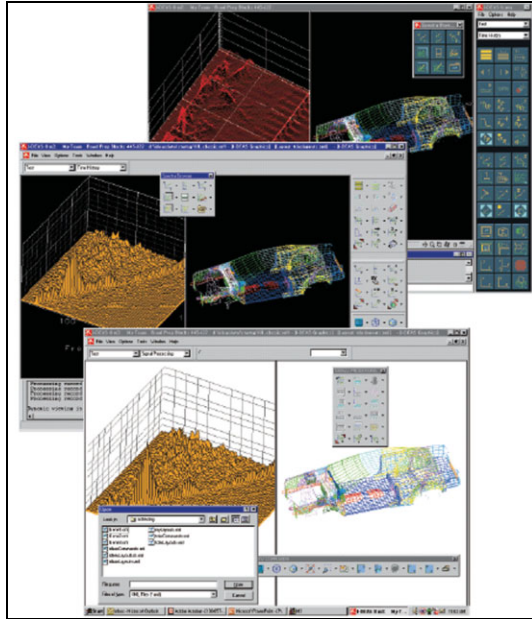
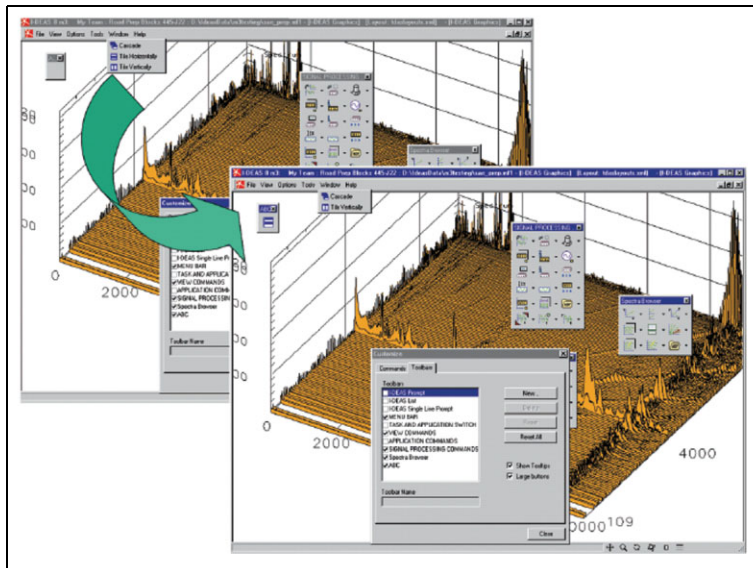


Fig. 2
 Pull-down menus are fully customisable. Just drag and drop. Top level menus can be changed or rearranged and sub-menus can be added at various levels



Process Automation and Customisation

Poorly-integrated engineering tools can make your work life miserable and keep your projects from reaching their potential efficiency. Brüel & Kjær recognises this problem as one that suppliers must aggressively solve to be recognised as a premiere total solutions partner in today's accelerating, integrated world. We also recognise that solutions cannot be a "one-size fits all" answer – you need the right tool for the right job. Thus, we offer you a broad range of utilities and tools within Test for I-deas to help solve your integration problems. Our solutions range in scope from simple tools like macro recording to Tcl and APIs for C++ development.

The Test for I-deas solutions line-up include:

- Extensive toolbar and user interface layout manipulation and customisation
- Keystroke sequence macros – recording and editing
- Test for I-deas programme files (user scripting)
- Visual Basic Open Interface
- Associated Data Files Library (ADFLib)
- Vendor library/Data acquisition processor
- Tool command language (Tcl) scripting
- Interface to MATLAB® (IMAT)
- Electronic Test Information Management (eTIM™) driver application programming interface

- Test for I-deas Reporter™
- Industry standards: binary and ASCII .unv files
- Third-party data format support (import, export)

Keystroke Macro Recording

This functionality allows you to record a session where all operations, including icon clicks, entries in forms, menu selections, and other user inputs are captured in a macro text file that can be replayed on demand. This enables capturing and automating process specific tasks and enabling the user to repeat the sequence quickly and easily by simply pressing a button. These programme files can also be edited and programming constructs such as repetitive looping, if-then testing, user variables, and much more can be added.

Programme Files

A step above macro recording is Test for I-deas programme files. These typically start with a macro for the underlying basic functionality and are then extended using a simple text editor to perform more powerful operations like automated looping, repetitive operations, etc. With less than a minute of effort a program file can be connected to a pushbutton icon for convenient, instant use.

Visual Basic Open Interface

With the increasing popularity and ease of use of Microsoft® Visual Studio and Visual Basic®, an easy to use interface between Visual Basic®, Test for I-deas, and the Microsoft® Office suite: Visual Basic Open Interface (VBOI).

The interface permits Visual Basic® developers to quickly create customised applications that can interface with Test for I-deas software. The interface has been developed using an ActiveX® control that packages all the necessary code and exposes only a few simple methods. This control is distributed in a VBOI developer's kit that contains the ActiveX® control, documentation, and several examples, including a quick graphics viewer and a Microsoft® Excel® interface.

Associated Data Files Library

Writing software for direct access to an application's native data files using only a paper document of the file format can present a special challenge. If the supplier adds to or corrects or otherwise changes the data format, you have to re-code the routines you wrote to access the data. ADFLib is a convenience library that makes our on-going maintenance of software transparent to applications you write to access our native data files. Associated Data Files (ADF) is the generic term for the group of Test for I-deas files that hold not only the raw time, spectrum, histogram, and other functions from your projects, but which also hold the results of your analyses: coordinates, modal parameters, order tracks, and a wide variety of other data. This is data which is not stored in Test for I-deas model files. The comprehensive yet easy-to-use library is implemented as a standard DLL in Microsoft® Windows® environments and also as a runtime library under UNIX®. You do not need any license or server process running in the background to use it.

Vendor Library/Data Acquisition Processor

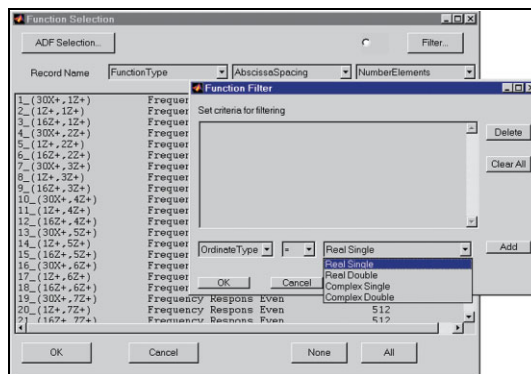
A Data Acquisition Processor (DAP) is an intermediate process between a core application like Test for I-deas software and the operating system running inside a measuring instrument. It translates the settings and operations from the software user interface into commands and actions that are required to perform the wide variety of measurements supported in the software. All applications that provide for control of live dynamics measurements, such as Test for I-deas Standard Measurements module, have a DAP. The DAP development environment is usually C or C++. As this is a more advanced interface tool, typically a few days of training are supplied to the developer interfacing a measuring instrument to Test for I-deas software.

Tcl Scripting

Tcl (tool command language, pronounced “tickle”) is an open-source industry standard tool set, which is actually two things: a language and a library. First, Tcl is a simple textual language intended primarily for issuing commands to interactive programs such as text editors, debuggers, illustrators and shells. It has a simple syntax and is also programmable so Tcl users can write command procedures to provide more powerful commands than those in the built-in set. Second, Tcl is a library package that can be embedded in application programs. The Automotive Sound Quality suite of products is built on a Tcl foundation. It is not necessary to install Tcl or a Tcl development environment to take advantage of this capability.

You gain several advantages from using Tcl for a command language. First, Tcl provides a standard syntax: once users know Tcl, they will be able to issue commands easily to any Tcl-based application. Second, Tcl provides programmability, providing many utility commands plus a general programming interface for building up complex command procedures. Third, extensions to Tcl, such as the Toolkit (Tk), provide mechanisms for communicating between applications by sending Tcl commands back and forth. The common Tcl language framework makes it easier for applications to communicate with one another. Automation of your repetitive processes can be accomplished by means of these Tcl scripts that leverage underlying signal processing routines in the software.

Fig. 3
The IMAT toolbox makes all Test for I-deas data attributes visible and accessible from inside MATLAB and provides a quick plotting utility for Test for I-deas data types



IMAT – Interface to MATLAB

In engineering and education communities, MATLAB has become almost as widespread a tool as Microsoft® Excel®. In recognition, we have developed IMAT for bi-directional data exchange and manipulation with Test for I-deas applications. This product provides three major areas of functionality.

Conversion of Test for I-deas formats to/from native MATLAB files with intelligent selection and filtering criteria that go far beyond simple bulk file loading.

A suite of convenience functions for performing matrix operations in MATLAB that is common to structural analysis and signal processing of structural test and other dynamic data.

A facility to retain important qualifiers and header information typically not tracked in the purely mathematical MATLAB environment. With this powerful, yet extremely easy to use set of features, it is easier than ever to extend the functionality of Test for I-deas products in ways that you prefer to keep proprietary within your organisation, or in ways that Brüel & Kjær was simply never asked to implement.

eTIM and Reporter

You have the critical need to keep up the efficiency and productivity of work processes in your environment of multiple engineering software tools and data formats. Brüel & Kjær has a solution for the requirement to easily and efficiently archive, find, compare, and report on test and analysis data from different sources. The solution is Electronic Test Information Management (eTIM) and Reporter software.

A “driver” for eTIM software is what understands, interprets, and converts the application-specific data to be archived to eTIM software. It automatically extracts important information about your test and analysis data, such as descriptive, business context, and technical data about the test, settings, associated files, and saves it in the eTIM archive. It then places the original data in its native format in the eTIM vault, thus there is no loss of information. The Reporter is the set of features that enables a quick and easy way to view, compare, and organise

data from a wide variety of sources into Microsoft® Office compatible reports and ActiveX® container pages.

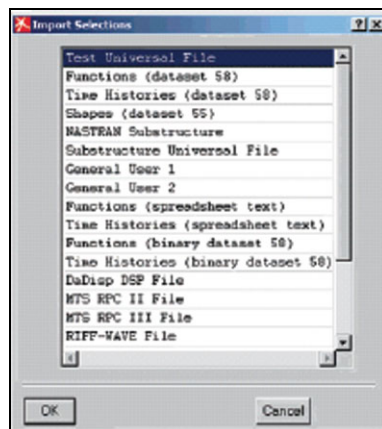
As part of Test for I-deas open solutions strategy, eTIM makes available a driver development toolkit (application programming interface – API). This toolkit has two main parts:

- A set of tools for interpreting and extracting information from data to be archived
- Tools for embedding eTIM data management and retrieval functionality into your application

Industry Standards: Binary and ASCII UNV Files

Since the late 1970's, universal (.unv) files have been used as a medium of exchange of information between test and analysis applications in the structural testing and analysis industry. UNVs are in widespread use exchanging covering functions (time, frequency, orders, histograms, waterfalls, and more) as well as a wide variety of experimental and FEM structural analysis data types (elements, nodes, tracelines, mode shapes, modal parameters, and many more). Nearly all manufacturers of test and measurement instruments and applications in the noise and vibration, as well as the FEM industry, support the UNV standard. In the mid-1990s, driven by industry leaders like Boeing, Ford, many universities and equipment suppliers, a binary universal file specification was introduced and has since come into widespread use. Very similar to the original ASCII specification – a feature required as the size of data transfers among applications continues to expand keeping pace with capacity and performance advances in the computing industry. Brüel & Kjær is an industry leader in promoting the widespread use of this standard. At every release of our products we execute a battery of automated tests that reconfirm the robustness of our adherence to this standard. Open documentation for these standards is available on our website at www.bksv.com.

Fig. 4
Test for I-deas Import/
Export facility



Third-party Data Format Support (Import, Export)

In the present-day environment of multiple tools and product development partners and suppliers using a wide variety of different engineering tools, noise and vibration solution providers like Brüel & Kjær have to allow for the eventuality that customers will want an interface to and from a proprietary measurement system's data structure. Using some of the tools mentioned above, another option is to integrate directly inside the Test for I-deas Import/Export facility (see Fig. 4).

Within the facility, the “General User” placeholders have been provided as a framework for the quick and easy integration of this capability directly into Test for I-deas software. This mechanism has also been used by customers to develop simple interfaces to read previously-acquired data from local storage inside an instrument via industry-standard interfaces such as RS – 232, IEEE 488 and USB.

Specifications – Test for I-deas Visual Basic Open Interface BZ-6023

RECOMMENDED PC

- Pentium® 4 1.6 GHz mobile, or faster, with 256 MB of RAM (UL 0176-A-xx^a recommended)
- 20 GB hard disk or larger
- CD-ROM: 24 ×/10 ×/24 × DVD/CD/RW ROM
- Sound Board: 16 bit SB Pro-compatible 3D
- Network: Ethernet
- Minimum 500 MB free space on hard disk
- Microsoft® Windows NT® or Windows® 2000
- Microsoft® Office 2000 (Service Release 2) or Microsoft® Office XP
- Microsoft® Internet Explorer 6.0
- Adobe® Reader® 6.0

HARDWARE CONFIGURATION

The software automatically detects the front-end hardware connected and configures the system. If IEEE P 1451.4 capable transducers, (with standardised TEDS), are being used, these are also detected and attached automatically to the correct channel of the input module

CALIBRATION

Calibration can be performed before or after measurement. The program uses automatic calibration sequencing

Measurement Control

- Save/recall/edit measurement sessions
- Measurement preview/scope mode
- Unlimited frame/block/FFT size

TRANSDUCERS AND CHANNELS

- Transducer database
- Drop, mass, microphone and reference dynamic calibration
- Dynamic EU calibration based on user-entered value
- Dynamic EU calibration based on DC reference level
- Dynamic EU calibration from AC reference signal
- Auxiliary gain (ext. conditioner) adjustment
- Simultaneous multiple channel calibration
- Document if ext acoustic weighting applied
- Multiple decimated sample rates, selectable per channel
- DC offset removal via software
- Channel table spreadsheet

SIGNAL AVERAGING

Averaging types available for the measured signals are:

- Stable, peak hold, exponential, or none
- Overlap processing to $-1 dt$
- Fast/Slow metre response (octave and level only)
- Realtime ANSI / ISO octave band filters

TRIGGER TYPES

- Free run, first frame, every frame
- Manual, channel, external
- Slope, level on any channel
- Pre- and post-trigger delay

SOFTWARE-BASED AUTORANGING

- Frame-by-frame
- Across full time history
- Up only, down only, or up and down
- Per-channel selectable on/off

a. xx specifies country: GB, DE, FR, ES, IT, SE, DK, US

Measurement

SAMPLING WINDOWS

Hanning narrow and broad, flat top, exponential, and impact

Display

- Average or instantaneous
- FRF, COH, Xspec
- All-channel level +offset
- Live cursors
- Copy graph to ActiveX® container
- Tightly integrated with SDRC®'s CAD and FEA solutions

GRAPH TYPES

Display of functions in a range of graph types including:

- Time
- Spectrum
- Waterfall
- Spectrogram
- Campbell diagram

User Interface

- Native Microsoft® Windows® environment
- Customisable layout, commands, toolbars and menus
- Application wizards
- Adaptable interface, either: "Classic" Test for I-deas interface, Windows®-based (default), or customised

Programmability

Test for I-deas software fully support the development of customised control programmes, using:

- Test for I-deas Visual Basic Open Interface with Microsoft® Visual Studio (Visual Basic®, Visual C++®, ActiveX® controls, etc.)
- Test for I-deas programme files
- Tool command language (Tcl) scripting
- Macro recording

Import and Export

Interface of data to/from a file in ASCII format or to spreadsheet packages such as Microsoft® Excel® 2000, or later. Also Binary, Binary and ASCII Universal Files, XML and WAV (Data Recorder Type 7701 or Time Capture Type 7705 license required) are supported

Export and import of data for further processing to and from MATLAB® possible via Test for I-deas IMAT tool

Data Management

Using eTIM, Test for I-deas open, web-enabled information management

solution, test and analysis data can be archived, retrieved, viewed and compared. Associated data that can be queried via a network drive and/or Windows® Explorer, incl. photographs, video clips, configuration files, etc., can be also stored in this relational database

Reporting

Integrated reporting with Microsoft® Office programmes. ActiveX® controls supported

Ordering Information

BZ-6023-F Test for I-deas VBOI

SERVICES

M1-6023-F Annual Software Maintenance and Support Agreement
M2-6023-F Annual Software Maintenance and Support Agreement

TRADEMARKS

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Brüel & Kjær reserves the right to change specifications and accessories without notice

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