



TEC-IT

TBarCode/X

Barcode Solution for Linux®, UNIX® and
OS X®

White Paper

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Barcodes for Linux[®], UNIX[®] and OS X[®]

Complete Barcode Support

TBarCode/X is the professional software package for Linux[®], UNIX[®] or OS X[®] based operating systems, which enables you to embed bar code printing or barcode functionality into

- print- or spool-servers
- ERP systems like SAP[®] ERP or ORACLE[®]
- self-developed applications
- web-based systems

TBarCode/X optimizes the flow of information. Printing, faxing and publishing all types of barcodes (linear, 2D, GS1 and Composite Symbologies) will be an integrated part of your workflow.

TBarCode/X is used to

- optimize the supply chain (SCM)
- cover document management requirements
- meet industry compliance (VDA, Odette, Galia, B-10 forms, ...)
- automate warehousing and distribution (TNT[®], FedEx[®], UPS[®], DHL[®] ...)
- automate field services

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| FROM: BHV MOTOREN AG D-80000 MUENCHEN GERMANY test@bmw.co.at GERMANY | | TO: M PREYMESSE GMBH & CO KG SPEDITION ECHING B. MUENCHEN PLANT/DOCK: LC 15 C | |  |
| QUANTITY: 160 | MATERIAL HANDLING CODE: A6-987 | REFERENCE: G1155 | | |
| FILE NUMBER: 12345678 | | | | |
| LENGTH (PLAT EU):  UN 123456789 A2B4C6D8 | | SHIPMENT DATE: 24SEP2001 CONTAINER TYPE: SC151208 GROSS WEIGHT: 10 | | |
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- Barcode Generator for Linux[®] UNIX[®] OS X[®]
 - 100+ Barcode Symbologies



TBarCode/X – Usage Scenarios

TBarCode/X supports three main functional areas:

Print-Server Installation (Barcode-Printer Emulation)

TBarCode/X turns all of your printers into barcode printers. A suitable plug-in for printer-queues is part of the package. After installation each PostScript® or PCL® compatible output device provides full-featured barcode support. Barcoding functionality is available instantly – without upgrading the printers (neither hardware nor software upgrades are required). All barcode related work is done on the print-server.

Barcode Library for Developers

Software developers can take advantage of the barcode functionality offered by the included barcode library (barcode SDK). The API of this library is well documented and enables the use of *TBarCode/X* as part of your application. The library can be used in conjunction with all development environments. Barcodes are generated in PostScript®, PCL®, PDF¹, as image or via user-defined callback functions.

Stand-Alone Barcode Generator

Finally, *TBarCode/X* offers a ready-to-use command line application. This executable can be used manually, from within shell-scripts or as part of web-applications (e.g. PHP). Barcodes are saved as image files or as vector graphics. All barcode related parameters can be specified via command-line parameters. Choose between the supported output formats and embed the generated barcodes into your documents or web-pages.

- Ready-to-Run Spool-Filter for Print-Servers
- Barcode SDK for Developers
- PostScript® or PCL®
- Stand-Alone Application

¹ Barcode image only, no human readable text (if required we refer to our TFORMer software)

Highlights

Extensive Barcode Support

TBarCode/X offers extensive barcode support – more than 100 different barcode symbologies are implemented. Linear as well as high-capacity two-dimensional (2D) codes like PDF417, MicroPDF, Data Matrix, MaxiCode or QR-Code are included. *TBarCode/X* also supports GS1 DataBar and GS1 Composite Symbologies.

Saves Money

You benefit from barcode techniques without costly barcode printers.

Upgrading printers with specialized and expensive barcode modules is not required. *TBarCode/X* generates barcodes on all PostScript® or PCL® compatible devices.

Saves Time

TBarCode/X is available as binary package for most operating systems or platforms - no compilation is required.

When it comes to barcode printing, there is no need for device-specific, time consuming and annoying escape-sequence programming.

Versatile Solution

TBarCode/X can be used as ready-to-run spool-filter, as command line application (e.g. within shell-scripts) or as barcode generator library (for software developers).

Multiple Output Formats

TBarCode/X is completely device independent. It can be used to print barcodes on all printers compatible with PostScript® or PCL®. Besides this, barcodes can be generated in various supported bitmap and vector formats.

Unified Bar-Coding

TBarCode/X eliminates output device specific configuration efforts. Barcodes are generated with simple commands or control sequences. Control sequences are identical among different output devices.

Embed Barcodes

TBarCode/X embeds barcodes within the document itself, meeting the legal requirements for archiving purposes that exist in many countries.

- Works with existing Printers
- No Printer Upgrades
 - High Throughput
- Outstanding Stability
- More than 100 Barcodes
- Linear, 2D, Composite Codes are supported

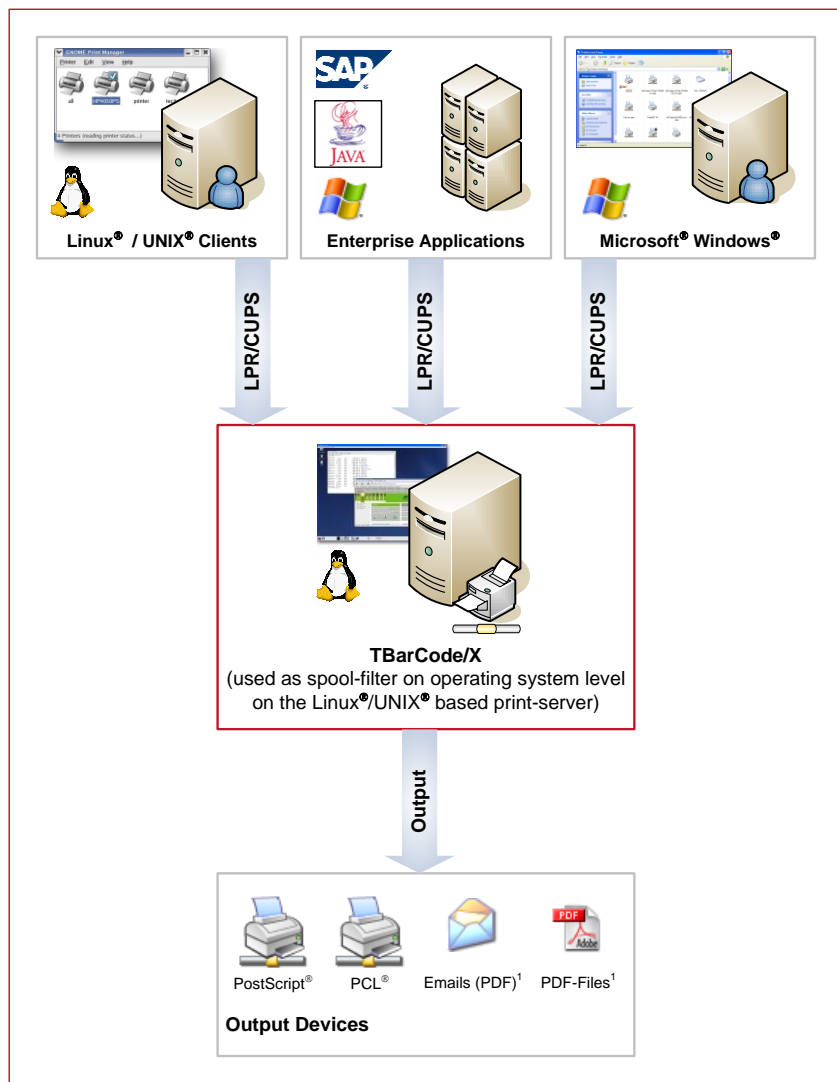
Scenario 1: Print/Spool-Server Installation

Overview

TBarCode/X is plugged into the printer queues on operating system level. Barcodes are generated for all PostScript® or PCL® compatible printers.

Most likely one server-based installation fulfills all your bar-coding requirements.

This works completely transparent to the superordinate systems. In contrast to traditional methods all barcode configuration is device independent.



- For PostScript® and PCL®
- Direct Printing
 - Optional: Automatic PDF Conversion
 - Optional: Automatic Emailing

1) Details for PDF/Email generation are available on request (not part of the solution). Please contact TEC-IT

Operating Principle

TBarCode/X works with all applications utilizing output streams compatible with PostScript® or PCL®. The workflow is as follows:

- An arbitrary application prints documents. Barcode specific control sequences are embedded into this data. The output is sent to the spool-system of the Linux® or UNIX® box.
- The *TBarCode/X* filter application (which is part of the package) is plugged into the standard spooler system on operating system level and intercepts each print-job.
- Whenever a barcode specific control sequence is detected, *TBarCode/X* extracts it and replaces it with the corresponding barcode. *TBarCode/X* automatically detects PostScript® or PCL® data-streams and does not affect print-jobs without barcode information. Barcodes can be placed on absolute page-positions or relative to the current cursor position.
- The resulting data-stream is sent to the device by the spool-system.

Applications or Systems

Your Application

A legacy application or an ERP-system (like SAP® R/3® or ORACLE®) prints documents. Embedded into these documents are control sequences for barcode generation.

Linux®/UNIX® based Printserver

Spool-System on Linux® / UNIX®

The spool-system receives the print job. The job is passed over to the filter application for handling barcode control sequences.

TBarCode/X Filter

The data of each print-job is filtered. If a barcode specific control sequence is detected it is replaced with the corresponding barcode.



Output Devices (PostScript® or PCL®)



- Central Installation
 - Extends Spooling System
 - No unwanted Side Effects
 - Per-printer Configuration (LPR)

Advantages of Print-Server Installations

Integrates Seamlessly

The print- or spool server is the ideal location for barcode generation.

TBarCode/X offers complete, transparent bar-coding features to all applications and hides device-dependencies from the user.

Minimized Deployment

TBarCode/X is installed only within the print-server. No additional software roll-out is required.

ERP-Ready

TBarCode/X works with well-known ERP systems like SAP® ERP or ORACLE®. Even legacy system may benefit from *TBarCode/X*.

Transparent Spool-Filter

Part of the package is a so-called filter-application, which plugs into printer-queues. This filter works in a completely transparent way to all applications and turns PostScript® or PCL® compatible printers into full-featured barcode devices.

Performance and Stability

TBarCode/X was developed with performance in mind. The size of the print-jobs is increased only minimally. *TBarCode/X* is ideally suited for shop-floor or high availability applications.

Independence

Customers can choose between printer models and printer manufacturers at any time.

- Seamless Integration
 - No Deployment
- No Printer Upgrades
- Printer Independent
 - ERP-Ready

Scenario 2: For Software Developers

Overview

TBarCode/X is available as shared or static library. Software developers are able to link *TBarCode/X* with own applications.

In this case the generation of barcode symbols is completely controlled by the programmer. An extensive set of API functions (application program interface) is available to adjust each possible barcode parameter.

Cross-Platform

The API of *TBarCode/X* is compatible with the Microsoft® Windows®-based version of the product named *TBarCode DLL* (part of TBarCode SDK).

Output Formats

The output format of the barcodes is adjustable – choose between:

- PostScript®
- PCL®
- PDF¹
- Image Formats (JPG, PNG, GIF...)²
- Customized barcode drawing functions by utilizing the callback feature of *TBarCode/X*. In this case every bar or square of a barcode is drawn by your application (e.g. on specialized output devices).

Integration

If a more flexible integration is preferred, it is also possible to call a ready-to-run stand-alone application for barcode generation. This stand-alone application (named `tbarcode`) may be forked from within your application, called in shell-scripts or executed via web-pages.

- Cross-Platform Barcode SDK
- Shared or Static Linking
- Various Output Formats
 - User defined Barcode Drawing (Callback Functions)
 - Extensive API

¹ Image only, no human readable text (if required, check out our TFORMer solution)

² Image only, no human readable text (if required, check out our TFORMer solution)



Scenario 3: Stand-Alone Application

Overview

TBarCode/X comes with a ready-to-run stand-alone application. This command-line application can be executed manually or within shell-scripts.

This command line tool is the ideal solution for ad-hoc barcode creation requirements as in

- pre-press applications
- graphic studios
- print-shops
- barcode film production

TBarCode/X allows the user to adjust all relevant barcode parameters (like output resolution, module width, print-ratio, pixel shaving ...) and creates high-quality output which can be used immediately in other applications (like GIMP or Adobe® Photoshop®).

- Stand-Alone Application
- Ready-To-use
- Command-Line Barcode Generator



Supported Linear (1D) Barcodes

| Barcode Symbology | |
|---|---|
| Codabar (2 widths variant) | ✓ |
| Code 11 | ✓ |
| Code 128 (auto-compress) | ✓ |
| Code 128 Character Set A | ✓ |
| Code 128 Character Set B | ✓ |
| Code 128 Character Set C | ✓ |
| Code 2 of 5 IATA | ✓ |
| Code 2 of 5 Industrial | ✓ |
| Code 2 of 5 Interleaved | ✓ |
| Code 2 of 5 Matrix / Code 2 of 5 Standard | ✓ |
| Code 39 (Code 3 of 9) | ✓ |
| Code 39 Extended (Full ASCII) | ✓ |
| Code 93 | ✓ |
| Code 93 Extended (Full ASCII) | ✓ |
| Deutsche Post Identcode | ✓ |
| Deutsche Post Leitcode | ✓ |
| EAN13 | ✓ |
| EAN13 + 2 digits add on | ✓ |
| EAN13 + 5 digits add on | ✓ |
| EAN14 | ✓ |
| EAN8 | ✓ |
| EAN8 + 2 digits add on | ✓ |
| EAN8 + 5 digits add on | ✓ |
| Flattermarken | ✓ |
| ISBN / Bookland | ✓ |
| Serial Shipping Container Code (AI00) | ✓ |
| Telepen Alpha | ✓ |
| UCC/EAN-128 | ✓ |
| UPC-A | ✓ |
| UPC-A + 2 digits add on | ✓ |
| UPC-A + 5 digits add on | ✓ |
| UPC-E | ✓ |
| UPC-E + 2 digits add on | ✓ |
| UPC-E + 5 digits add on | ✓ |
| ITF-14 | ✓ |
| LOGMARS | ✓ |
| MSI | ✓ |
| NVE-18 | ✓ |
| OMR-Code / Flattermarken | ✓ |
| Pharmacode 1-Track | ✓ |
| Pharmacode 2-Track | ✓ |

- 70+ Barcodes supported
 - Linear Barcodes
 - 2D Barcodes
- Composite Barcodes

| Linear Symbolologies (continued) | |
|--|---|
| Plessey | ✓ |
| PZN (Pharma Zentral Nr. Germany) | ✓ |
| Australia Post 37-Customer (Australian Post Customer) | ✓ |
| Australia Post 52- Customer (Australian Post Customer 2) | ✓ |
| Australia Post 67- Customer (Australian Post Customer 3) | ✓ |
| Australia Post Redirection | ✓ |
| Australia Post REPLY Paid | ✓ |
| Australia Post Routing | ✓ |
| Japanese Postal (Customer) Code | ✓ |
| Korean Postal Authority Code | ✓ |
| Planet-12 | ✓ |
| Planet-14 | ✓ |
| Royal Mail 4 State (RM4SCC) | ✓ |
| USPS Postnet 5 digits (ZIP) | ✓ |
| USPS Postnet 9 digits (ZIP+4) | ✓ |
| USPS Postnet 11 digits (ZIP+4+2) | ✓ |

New symbolologies are added continuously. Please contact TEC-IT if a barcode type not listed here is required.

- 100+ Barcodes supported
- Linear Barcodes
 - 2D Barcodes
- Composite Barcodes

Supported Complex Barcodes

2D Barcodes (High Density)

| Barcode Symbology | |
|-------------------|---|
| PDF417* | ✓ |
| PDF417 Truncated* | ✓ |
| Data Matrix* | ✓ |
| MaxiCode* | ✓ |
| QR-Code* | ✓ |
| Codablock F* | ✓ |
| MicroPDF417* | ✓ |

*: needs 2D license (not included in 1D license)

GS1 DataBar Symbologies

| Barcode Symbology | |
|-------------------------------|---|
| GS1 DataBar (RSS-14) | ✓ |
| GS1 DataBar Limited | ✓ |
| GS1 DataBar Truncated | ✓ |
| GS1 DataBar Stacked* | ✓ |
| GS1 DataBar Stacked Omni* | ✓ |
| GS1 DataBar Expanded | ✓ |
| GS1 DataBar Expanded Stacked* | ✓ |

*: needs 2D license (not included in 1D license)

GS1 Composite Symbology

| Barcode Symbology | |
|--|---|
| GS1 DataBar Composite Symbology (CC-A/B)* | ✓ |
| GS1 DataBar Limited Composite Symbology (CC-A/B)* | ✓ |
| GS1 DataBar Truncated Composite Symbology (CC-A/B)* | ✓ |
| GS1 DataBar Stacked Composite Symbology (CC-A/B)* | ✓ |
| GS1 DataBar Stacked Omni Composite Symbology (CC-A/B)* | ✓ |
| GS1 DataBar Expanded Composite Symbology (CC-A/B)* | ✓ |
| GS1 DataBar Expanded Stacked Composite Symbology (CC-A/B)* | ✓ |
| EAN-8 Composite Symbology (CC-A/B)* | ✓ |
| EAN-13 Composite Symbology (CC-A/B)* | ✓ |
| UPC-A Composite Symbology (CC-A/B)* | ✓ |
| UPC-E Composite Symbology (CC-A/B)* | ✓ |
| EAN-128 Composite Symbology (CC-A/B/C)* | ✓ |

*: needs 2D license (not included in 1D license)

- 70+ Barcodes supported
 - Linear Barcodes
 - 2D Barcodes
- Composite Barcodes
- VDA/BeloM-compliant (PDF417)

New symbologies are added continuously. Please contact TEC-IT if a barcode type not listed here is required.

Datasheet

TBarCode/X

- For PostScript® and PCL®
 - Wide Range of Operating Systems
 - Support of LPR, LPRng, CUPS

| Overview | |
|--|---|
| Current Version | V11 |
| Costs per printer | None |
| Costs per user | None |
| Additional hardware required | None |
| Operating system dependencies | See below. Requests for special operating system are welcome. |
| Supported printing protocols for print-server installation | LPR, LPRng, CUPS |
| For PostScript® compatible printers | ✓ |
| For PCL® compatible printers | ✓ |

| General | |
|--|----------|
| Ready-to-use Stand-Alone Application | Included |
| Static and Shared Libraries for Developers | Included |
| Spool-Filter Plug-In | Included |
| Barcode Generator Daemon for high-performance applications | Optional |

| Operating Systems (LINUX/BSD based) | |
|---|---|
| SuSE 9 and higher (x86) | ✓ |
| SLES 9 and higher (x86) | ✓ |
| Ubuntu 5.04 (Debian based) and higher (x86) | ✓ |
| RedHat Enterprise 4 and higher (x86, x86-x64) | ✓ |
| RedHat 9 and higher (x86) | ✓ |
| RedHat 7.3 (x86) | ✓ |
| Fedora Core 4 and higher (x86) | ✓ |
| SuSE 7.0 (x86) | ✓ |
| Mandrake 10 and higher (x86) | ✓ |
| FreeBSD 5 (x86) | ✓ |

| Operating Systems (HP-UX/AIX/Solaris based) | |
|---|---|
| Solaris 9 (SPARC) | ✓ |
| Solaris 10 (SPARC) | ✓ |
| Solaris 10 x86/x64 | ✓ |
| AIX 5.2 (PowerPC) and higher | ✓ |
| AIX 4.3 (PowerPC) | ✓ |
| HP-UX 11i v3 (IA64) | ✓ |
| HP-UX 11i v2 (Itanium-2 & PA-RISC) | ✓ |
| HP-UX 11i v1 (PA-RISC) | ✓ |
| HP-UX 11 (PA-RISC) | ✓ |

| Operating Systems (based Mac OS® based) | |
|---|---|
| Mac OS X 10.4 (x86, x86_64) | ✓ |
| Mac OS X 10.4 (universal) | ✓ |

Licenses

Free Demo License

TEC-IT Datenverarbeitung GmbH offers an unlimited demo-version of *TBarCode/X* free of charge. The barcodes generated by the demo-version are marked with an additional horizontal bar across the barcode – but the barcodes are usually still readable with barcode scanners or decoding software.

To install the demo version download *TBarCode/X* from <http://www.tec-it.com>. Please make sure to download the binary suitable for your platform.

Licensing/Pricing for Print- or Spool-Server Installation

TBarCode/X for the use in print- or spool-servers is licensed on a per-server basis. Please contact us for details and provide us a description of your requirements (number of installations, number of facilities or sites, app. number of printers).

Licensing/Pricing for Software Developers

When licensing *TBarCode/X* for development purposes, TEC-IT grants you the right to redistribute the libraries of *TBarCode/X* up to 10000 times as part of your application. No royalties are charged.

Source code licenses (e.g. for usage in printer firmware) are available.

Licensing/Pricing for Web/Application Servers

TBarCode/X for the use on web- or application-servers is licensed on a per-server basis. Please contact us for details and provide us with a description of your requirements (number of servers, number of facilities or sites, number of users).

- No Costs per User
- No Costs per Printer
 - Simple Licensing



Contact Information

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