

Digital Miracles L.L.C.



Digit-Eyes

Product Code (UPC/EAN) API Overview

Revision history:

April 24, 2010	V 0.0	Initial publication
April 28, 2010	V 0.1	Expanded error codes for serial number tracking feature
May 25, 2010	V 0.2	Added feature to UPC service to accept user input
June 21, 2010	V 0.3	Added feature to let user report database errors, also added recommended price engine logic
July 31, 2010	V 1.0	Production release
Nov 15, 2012	V 2.0	Added keys and simplified API for public use
Mar 13, 2013	V 2.1	Documented the Batch APIs, added Terms and conditions from website
Mar 23, 2013	V 2.2	Added error code 995 (reject for bad UPC number), added section on UPC check digits, country codes and other useful information
May 09, 2013	V 2.2.1	Clarified the use of the terms "K Code" and "M Code"
May 09, 2013	V 2.3	Split into base and "code" portions to improve clarity and usability; changed name to "API Overview"
June 27, 2015	V 2.4	Documented the addition of the formatted nutrition data field

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DIGIT-EYES UPC/EAN DATABASE API

OVERVIEW

Digit-Eyes has a private database of UPC and EAN codes. The data includes product titles, descriptions and usage information. The database grows continually as a function of user activity and the performance of our proprietary robotic indexers. Information is also added by individuals. All individually-added content is human-verified to ensure data quality. As of September, 2013 it contains 37 million records in 12 languages.

Our own use of the information is to provide product identification services to people who are unsighted, but we also make database available for public use on our website and offer several different APIs to allow other developers to access the information.

SELECTING YOUR SERVICES

If you are a mobile app developer, you probably want to use the single-transaction API. This is designed to be a very fast and light-weight interface that let you find information about a particular item while avoiding using large amounts of bandwidth or storage on your target device. The API can provide JSON or XML format content; you specify which format is required at the time you submit a transaction.

If you are building a POS system, you will probably want to use the batch retrieval interfaces. These allow you to submit a large number of transactions for lookup at a single time. We also offer a delayed-retrieval service whereby the system will track any requests that you've submitted and that were not found. When our indexers find a source of information for your code, the information is placed in a private repository where you can come and retrieve it as your schedule permits.

If you are a manufacturer or large retailer, you will probably want to use the batch upload interface. This allows you to upload your entire product line (including image references) at a single time. You will also have the option of supplying the address of your product description pages on the Internet and indicating that all search traffic from Digit-Eyes should be directed to your individual product page.

LICENSING

The API is available for licensed use. The first 500 accesses after registration are without cost but have some functional limitations (delete transactions, for instance, will be parsed, but not applied to

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the database). To convert to full functionality, there is a one-time startup fee that covers 1,000 accesses plus unrestricted access to the data. Pricing is a fraction of a cent per item retrieved.

Details and product demonstrations are available at www.digit-eyes.com/gtin/

Payment for services is made in advance and through PayPal. You fund your account as you see fit and determine the threshold at which you want to be notified if the funding is running low. When funding is exhausted, the APIs stop returning content and instead returns error messaging; it is incumbent on the application designer to ensure that these messages are processed such a way that the application degrades gracefully if funding is being terminated or is uncertain.

Using the maintenance tools on your account you can set the point at which you wish to be notified that your account needs funding. In addition, when the system finds there are fewer than 1,000 accesses remaining, you will receive an email when each threshold of 100 is reached. You will receive one final warning when you get to 10 accesses remaining. When you make a deposit to your account on PayPal, this will immediately restore the service.

All transactions require your application key plus a signature that you create using your authorization key and the UPC or EAN code that you intend to access. Both these fields visible in your account display and can be retrieved at any time. These keys can be changed, but only by contacting support@digit-eyes.com

Detail License terms are included as Appendix A of this document.

OVERVIEW OF API SERVICES

JSON AND XML-BASED SINGLE-TRANSACTION API

The API allows remote applications to submit requests to retrieve UPC/EAN data, to submit UPC/EAN data and to note to the system that listings are incorrect or should be deleted. Upsert and delete requests are reviewed by the data curator and should be considered provisional until approved.

UPC/EAN DATA REQUESTS

You may submit a request to change a code or add a new one using the API. All requests must include your application key (“app_key”) plus the correct signature string, a value that is computed for each transaction using the authorization key, the language of the desired response, the UPC or

EAN code of the item you want to add or update and a list of the fields that you want to retrieve from the database:

If the UPC / EAN is found, the service returns as many of fields below as you have requested in JSON or XML format:

1. **description:** The title (short description) of the item (up to 255 characters)
2. **uom:** Unit of measure: up to 128 characters that describe the item size or weight. Examples might be '24 ounces', '750 ml', '12 pieces', or even just "1".
3. **brand:** product brand
4. **language:** language of listing;
5. **website:** web site where more information can be found about this item (512 characters; the root of the product web page will be used if that is supplied and this field is empty.)
6. **product web page:** web page where more information can be found about this item (512 characters);
7. **image:** location of the authoritative image of the item (512 characters);
8. **thumbnail URL:** location of a thumbnail image of the item (512 characters). Please note this is a extra charge feature, it is charged only if the requested thumbnail is available and supplied;
9. **thumbnail width:** location of an image of the item (512 characters);
10. **thumbnail height:** location of an image of the item (512 characters);
11. **usage:** romance description of the item, usage instructions if available (no length limit);
12. **ingredients:** elements from which the item is made (no length limit);
13. **nutrition:** if nutritional data if appropriate (no length limit). This is available as text ("nutrition") or in a structured format ("formattedNutrition").
14. **categories:** provide a list of product categories and tags that apply to this item in a comma-separated list (no length limit);
15. **manufacturer name:** manufacturer name
16. **manufacturer address:** manufacturer location: street address
17. **manufacturer address 2:** manufacturer location: suite, additional address
18. **manufacturer city:** manufacturer location: city;
19. **manufacturer state:** manufacturer location: state or political entity;
20. **manufacturer postal code:** manufacturer location: postal code
21. **manufacturer country:** manufacturer country
22. **manufacturer phone:** manufacturer phone
23. **manufacturer contact:** manufacturer email or contact name
24. **GCP:** Global Company Prefix
25. **GCP Company:** Company name of the CGP holder

26. **GCP GLN:** Global Location Number
27. **GCP address 1:** GCP holder's location: street address
28. **GCP address 2:** GCP holder's location: suite, additional address
29. **GCP city:** GCP holder's location: city;
30. **GCP state:** GCP holder's location: state or political entity;
31. **GCP postal code:** GCP holder's location: postal code
32. **GCP country:** GCP holder's country
33. **GCP phone:** GCP holder's phone
34. **GCP contact:** GCP holder's email or contact name
35. **GCP phone:** GCP holder's email or contact name
36. **GCP fax:** GCP holder's email or contact name

If the UPC code is not found, the service returns an error message that indicates the item is unknown

UPC/EAN UPSERT REQUEST

You may submit a request to change a code or add a new one using the API. All requests must include your application key (“app_key”) plus the correct signature string, a value that is computed for each transaction using the authorization key and the UPC key of the item you want to add or update. Upsert transactions for which a JSON response is required should be submitted as an http POST.

Although you can submit database additions, there are generally not needed; if you have an unsuccessfully searched code, it is an automatic feature of the Digit-Eyes system that it will be added to the high-priority search queue.

UPC/EAN DELETION REQUEST

If your users find information that is incorrect, this may be passed as a delete request. Items with such requests for put on suspense and reviewed within 48 hours. Confirmed failed items are removed from the database; erroneous ones are corrected and incorrectly flagged ones are simply released. Delete transactions for which a JSON response is required should be submitted as an http DELETE.

MULTIPLE-TRANSACTION (BATCH) API

This batch feature allows appropriately authorized and authenticated users to submit a list of UPC or EAN numbers for which information is requested.

BATCH RETRIEVAL

This batch feature allows appropriately authorized and authenticated users to submit a file of UPC numbers as a .csv file and to obtain any data from the database that is available in the requested language. Output is provided in HTML with a link to a .csv file of results.

BATCH UPDATE

This batch feature allows appropriately authorized and authenticated users to submit a file of UPC data as a comma-separated value (.csv) file. CSV is a common file format that can be produced by many spreadsheet programs such as Excel.

APPENDIX A: LICENSE AND TERMS OF USE

Last modified: March 1, 2013

Thank you for using the Digit-Eyes API. The API is provided by Digital Miracles, L.L.C. (referred to as Digital Miracles, we, our, or us in these terms), located at 1805 Cranbrook Drive, Colleyville, Texas 76034, United States. By using the Digital Miracles APIs, you agree to these terms.

These terms outline your rights and responsibilities when using our APIs, so read them carefully. Additional terms may apply to the use of an API, including additional terms of service, terms within the accompanying API documentation, and any applicable policies or guidelines. If there is a conflict between these terms and the additional terms, the additional terms apply for that conflict.

ACCOUNT AND REGISTRATION

ACCEPTING THE TERMS

You may not use the APIs and may not accept the Terms if (a) you are not of legal age to form a binding contract with Digital Miracles, or (b) you are a person barred from using or receiving the APIs under the applicable laws of the United States or other countries including the country in which you are resident or from which you use the APIs.

YOUR DIGITAL MIRACLES ACCOUNT

You may need to create a Digital Miracles account in order to use an API or a Digital Miracles account may be assigned to you by an administrator, such as your employer or educational institution. If you are using a Digital Miracles account assigned to you by an administrator, your legal relationship with your administrator may affect that account. It's your responsibility to keep your password, account credentials, and accounts secure. If you learn of any unauthorized use of your account, please notify us at support@digit-eyes.com

In order to access certain APIs you may be required to provide certain information (such as identification or contact details) as part of the registration process for the APIs, or as part of your continued use of the APIs. You agree that any registration information you give to Digital Miracles will always be accurate and up to date.

YOUR END USERS

You will require your end users to comply with any applicable law and these terms. You will not knowingly enable your end users to violate applicable law or these terms.

COMPLIANCE WITH LAW

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You will use our APIs only as permitted by law (including without limitation laws regarding the import or export of data or software, privacy, or local laws). You will not use the APIs to encourage or promote illegal activity.

PERMITTED ACCESS

You will only access (or attempt to access) an API by the means described in the documentation of that API. If Digital Miracles assigns you developer credentials or Client IDs, you must use them with the applicable APIs. You will not misrepresent or mask either your identity or your API Client's identity when using the APIs or developer accounts.

API LIMITATIONS

Digital Miracles may set limits on the number of API requests that you can make, at its sole discretion. You agree to such limitations and will not attempt to circumvent such limitations.

MONITORING

Digital Miracles may monitor the use of the APIs to ensure quality, improve Digital Miracles products and services, and verify your compliance with these terms. You will not interfere with such monitoring. Digital Miracles may use any technical means to overcome such interference.

COMMUNICATION WITH DIGITAL MIRACLES

You agree that we may send you certain communications in connection with your use of the APIs. Please review the applicable API documentation for information about opting out of certain types of communication.

FEEDBACK

If you provide feedback or suggestions about our APIs, then we may use such information without obligation to you.

YOUR API CLIENTS

API CLIENTS

The APIs are designed to help you enhance your websites and applications (API Client(s)). Digital Miracles reserves the right to investigate any API Client for compliance with these terms. Such investigations may include Digital Miracles accessing and using your API Client, for example to identify security issues that could affect Digital Miracles or its users. You consent to any such

investigation. Digital Miracles may suspend access to our APIs by you or your API Client without notice if we reasonably believe that you are in violation of these terms.

SECURITY

You will use commercially reasonable efforts to protect user information collected by your API Client, including personally identifiable information (PII), from unauthorized access or use and will promptly report to your users any unauthorized access or use of such information.

OWNERSHIP

Digital Miracles does not acquire ownership in your API Clients, and by using our APIs, you do not acquire ownership of any rights in our APIs or the content that is accessed through our APIs.

USER PRIVACY AND API CLIENTS

You will comply with all privacy laws and regulations including those applying to PII. You will provide and adhere to a privacy policy for your API Client that clearly and accurately describes to users of your API Client what user information you collect (such as PII, login information and Digital Miracles account data) and how you use and share such information (including for advertising) with Digital Miracles and third parties. If your privacy policy is used to comply with the EU Data Protection Directive, then it must adhere to the US Safe Harbor principles of Notice, Choice, Onward Transfer, Security, Data Integrity, and Access at http://www.export.gov/safeharbor/eu/eg_main_018475.asp

PROHIBITIONS

API PROHIBITIONS

When using the APIs, the following prohibitions apply:

- You will not sublicense an API for use by a third party. Consequently, you will not create an API Client that functions substantially the same as the APIs and offer it for use by third parties.
- You will not perform an action with the intent of introducing to Digital Miracles products and services any viruses, worms, defects, Trojan horses, malware or any items of a destructive nature.
- You will not defame, abuse, harass, stalk or threaten others.
- You will not interfere with or disrupt the APIs or the servers or networks providing the APIs.
- You will not promote or facilitate unlawful online gambling or disruptive commercial messages or advertisements.

- You will not reverse engineer or attempt to extract the source code from any API or any related software, except to the extent that this restriction is expressly prohibited by applicable law.
- Certain developer credentials are, by their nature, considered confidential. You will not disclose such confidential credentials to any third party except your agent(s) using such information solely on your behalf in accordance with these terms and under a written duty of confidentiality.
- Our communications to you may contain Digital Miracles confidential information. If you receive any materials or communications that are clearly confidential or marked confidential, then you will not disclose the Digital Miracles confidential information to any third party without Digital Miracles's prior written consent.

CONTENT

CONTENT ACCESSIBLE THROUGH OUR APIS

Our APIs contain some third party content (such as text, images, videos, audio, or software). This content is the sole responsibility of the person that makes it available. We may sometimes review content to determine whether it is illegal or violates our policies, and we may remove or refuse to display content. Finally, content accessible through our APIs may be subject to intellectual property rights, and, if so, you may not use it unless you are licensed to do so by the owner of that content or are otherwise permitted by law. Your access to the content provided by the API may be restricted, limited, or filtered in accordance with local laws, regulations, and policies.

ADVERTISING

Digital Miracles reserves the right in its discretion to include advertising in the content returned through the APIs. If any advertisements are returned, you may not modify such advertisements and you must show them in accordance with the relevant API documentation.

SUBMISSION OF CONTENT

Some of our APIs allow the submission of content, and except as expressly provided in these terms, Digital Miracles does not acquire any ownership of any intellectual property rights that you or your end users hold in the content that you submit to our APIs through your API Client. By submitting, posting or displaying content to or from the APIs through your API Client, you give Digital Miracles a perpetual, irrevocable, worldwide, royalty-free, and non-exclusive license to reproduce, adapt, modify, translate, publish, publicly perform, publicly display and distribute such content. However, Digital Miracles will only use such content for the purpose of enabling Digital Miracles to provide the APIs and only in accordance with the applicable Digital Miracles privacy policies. You agree that this

license includes a right for Digital Miracles to make such content available to other companies, organizations or individuals with whom Digital Miracles has relationships for the provision of syndicated services, and to use such content in connection with the provision of those services. Before you submit content to our APIs through your API Client, ensure that you have the necessary rights (including the necessary rights from your end users) to grant us the license.

RETRIEVAL OF CONTENT

When a user's non-public content is obtained through the APIs, you may not expose that content to other users or to third parties without explicit opt-in consent from that user.

DATA PORTABILITY

Digital Miracles supports data portability. By accessing users' data through the APIs for use in any of your services or applications, you agree to enable your users of any such service or application to export their equivalent data to other services or applications of their choice in a way that's substantially as fast and easy as exporting such data from Digital Miracles products and services, subject to applicable laws.

PROHIBITIONS ON CONTENT

Unless expressly permitted by the content owner or by applicable law, you agree that you will not, and will not permit your end users to, do the following with content returned from the APIs:

- Scrape, build databases or otherwise create permanent copies of such content, or keep cached copies longer than permitted by the cache header;
- Copy, translate, modify, create a derivative work of, sell, lease, lend, convey, distribute, publicly display or sublicense to any third party;
- Misrepresent the source or ownership; or
- Remove, obscure, or alter any copyright, trademark or other proprietary rights notices, falsify or delete any author attributions, legal notices or other labels of the origin or source of material.

BRAND FEATURES; ATTRIBUTION

BRAND FEATURES

"Brand Features" is defined as the trade names, trademarks, service marks, logos, domain names, and other distinctive brand features of each party. Except where expressly stated, these terms do not grant either party any right, title, or interest in or to the other party's Brand Features. All use by you of Digital Miracles' Brand Features (including any goodwill associated therewith) will inure to the benefit of Digital Miracles.

ATTRIBUTION

You agree to display any attribution(s) required by Digital Miracles as described in the documentation for the API. Digital Miracles hereby grants to you a nontransferable, non-sublicenseable, nonexclusive license during the term to display Digital Miracles' Brand Features for the purpose of promoting or advertising that you use the APIs. You must only use the Digital Miracles Brand Features in accordance with these terms and for the purpose of fulfilling your obligations under this Section.

PUBLICITY

You will not make any statement regarding your use of an API which suggests partnership with, sponsorship by or endorsement by Digital Miracles without Digital Miracles's prior written approval.

PROMOTIONAL AND MARKETING USE

In the course of promoting, marketing, or demonstrating the APIs you are using and the associated Digital Miracles products, Digital Miracles may produce and distribute incidental depictions, including screenshots, video, or other content from your API Client, and may use your company or product name. You grant us all necessary rights for the above purposes.

PRIVACY AND COPYRIGHT PROTECTION

DIGITAL MIRACLES PRIVACY POLICIES

By using our APIs, you agree that Digital Miracles can use submitted information in accordance with our privacy policies, such as <http://www.digit-eyes.com/privacy.html>

DIGITAL MIRACLES DMCA POLICY

We provide information to help copyright holders manage their intellectual property online, but we can't determine whether something is being used legally or not without their input. We respond to notices of alleged copyright infringement and terminate accounts of repeat infringers according to the process set out in the U.S. Digital Millennium Copyright Act. If you think somebody is violating your copyrights and want to notify us, please write to support@digit-eyes.com

TERMINATION

TERMINATION

You may stop using our APIs at any time. If you want to terminate these terms, you must provide Digital Miracles with 7 days prior written notice and upon termination, cease your use of the applicable APIs. Digital Miracles reserves the right to terminate these terms or discontinue the APIs or any portion or feature for any reason and at any time without liability or other obligation to you.

YOUR OBLIGATIONS POST-TERMINATION

Upon any termination of these terms or discontinuation of your access to an API, you will immediately stop using the API, cease all use of the Digital Miracles Features, and delete any cached or stored content that was permitted by the cache header. Digital Miracles may independently communicate with any account owner whose account(s) are associated with your API Client and developer credentials to provide notice of the termination of your right to use an API.

Surviving Provisions

When these terms come to an end, those terms that by their nature are intended to continue indefinitely will continue to apply.

LIABILITY FOR OUR APIS

WARRANTIES

Neither Digital Miracles nor its suppliers or distributors make any specific promises about the APIs. For example, we don't make any commitments about the quality of the APIs or the content accessed through the APIs, their reliability, availability or ability to meet your needs. The APIs and content accessed through the APIs are provided "as is". Some jurisdictions provide for certain warranties, like the implied warranty of the merchantability, fitness for a particular purpose and non-infringement. To the extent permitted by law, we exclude all implied warranties.

LIMITATION OF LIABILITY

When permitted by law, Digital Miracles, and Digital Miracles' suppliers and distributors, will not be responsible for lost profits, revenues, or data, financial losses or indirect, special, consequential, exemplary, or punitive damages. To the extent permitted by law, the total liability of Digital Miracles, and its suppliers and distributors, for any claim under these terms, including for any warranties that may not legally be excluded, is limited to the amount you paid us to use the APIs (or, if we choose, to supplying you the APIs again) during the six months prior to the event giving rise to the liability. Nothing in these terms limits your responsibility for infringement of intellectual property rights. In all cases, Digital Miracles, and its suppliers and distributors, will not be liable for any loss or damage that is not reasonably foreseeable.

INDEMNIFICATION

You agree to hold harmless and indemnify Digital Miracles, and its subsidiaries, affiliates, officers, agents, and employees, or partners, from and against any third party claim arising from or in any way related to:

- your misuse or your end user's misuse of the APIs; or

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- your violation or your end user's violation of these terms,

including any liability or expense arising from all claims, losses, damages (actual and consequential), suits, judgments, litigation costs and attorneys' fees, of every kind and nature. In such a case, Digital Miracles will provide you with written notice of such claim, suit or action.

GENERAL PROVISIONS

MODIFICATION

We may modify these terms or any additional terms that apply to an API occasionally, for example, to reflect changes to the law or changes to our APIs. We'll post notice of modifications to these terms or the additional terms within the documentation of each applicable API. Changes are effective seven (7) days after they are posted. However, changes specific to new functionality for an API or changes made for legal reasons will be effective immediately. You agree that your continued use of the API constitutes an acceptance of the modified terms.

GENERAL LEGAL TERMS

These terms control the relationship between Digital Miracles and you. They do not create any third party beneficiary rights. If you do not comply with these terms, and Digital Miracles does not take action right away, this does not mean that Digital Miracles is giving up any rights that it may have (such as taking action in the future). If it turns out that a particular term is not enforceable, this will not affect any other terms. The laws of California, U.S.A., excluding California's choice of law rules, will apply to any disputes arising out of or related to these terms or the services. All claims arising out of or relating to these terms or the services will be litigated exclusively in the federal or state courts of Tarrant County, Texas, USA, and you and Digital Miracles consent to personal jurisdiction in those courts.

APPENDIX B: A FEW USEFUL FACTS ABOUT UPC / EAN CODES

The Universal Product Code (UPC) is a barcode symbology (i.e., a specific type of barcode) that is widely used in North America, the United Kingdom, Australia, New Zealand and in other countries for tracking trade items in stores. Its most common form, the UPC-A, consists of 12 numerical digits, which are uniquely assigned to each trade item. Along with the related EAN barcode, the UPC is the barcode mainly used for scanning of trade items at the point of sale, per GS1 specifications.¹ UPC data structures are a component of GTINs (Global Trade Item Numbers). All of these data structures follow the global GS1 specification which bases on international standards. Some retailers (clothing, furniture) do not use the GS1 System but use other bar code symbologies such as code 128 or code 39 and other article number systems. Other retailers use the EAN/UPC bar code symbology but without using a GTIN (for products brands sold at such retailers only)².

The UPC/EAN numbers are managed worldwide by GS1, an international not-for-profit association with member organizations in most countries³. The codes in the US are issued by GS1 US.

The UPC/EAN does not identify the maker of the product (as many people believe), but identifies the party that has trade responsibility of the item and also uniquely identifies the item. While these are often the same party, this is not necessarily always the case.

UPC/EAN codes are divided into several sections, each of which is useful. Consider this code: 080480280024



- The above is actually a 13-digit version of a full 14-byte GTIN number 000 80408 28002 4;
- The first three digits tell you which country (in this case, **000** is the US). A complete list of code ranges and their assignments is in Appendix C.
- The value **80480** indicates who the party is within the address space of the US numbers who have trade responsibility for the item. In this case, it is *Bacardi U.S.A., Inc. 2701 South Le Juene Road, Coral Gables FL, 33134, US*⁴
- The number **28002** is the stocking number for the item.
- The last number, **4**, is a check digit for the preceding numbers.
- Looking the entire number up in the database, you'll find that it is Grey Goose Vodka. Cheers!
<http://digit-eyes.com/cgi-bin/digiteyes.fcgi?upcCode=00080480280024&action=lookupUpc>

¹ EAN/UPC <http://www.gs1us.org/resources/standards/ean-upc>

² Universal Product Code, Wikipedia http://en.wikipedia.org/wiki/Universal_Product_Code

³ Overview of GS1, GS1, <http://www.gs1.org/>

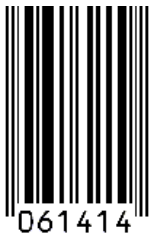
⁴ For a useful source of such information: <http://gepir.gs1.org/v32/xx/gtin.aspx?Lang=en-US>

Calculating the check digit for a UPC is simple and should be routinely performed as part of scanning to ensure the scan occurred correctly.

- The check digit is calculated by taking the base number without the check digit: 008048028002 and adding a leading zero if it is necessary to pad the number to an odd number of digits. Starting little-endian numbering of the digit positions at 0,
 - the digits in the even numbered positions are added and the sum multiplied by 3;
 - The digits in the odd-numbered positions are added;
 - The sum of the two operations is divided by 10 and the remainder subtracted from the next highest multiple of 10;
 - If the answer is 10 (because the remainder is zero), the check digit is 0;
 - Given a 14-byte array named @parts with individually-addressible bytes numbered 0-13:
$$\text{checkDigit} = (10 - (((@parts[0] + @parts[2] + @parts[4] + @parts[6] + @parts[8] + @parts[10] + @parts[12]) * 3) + (@parts[1] + @parts[3] + @parts[5] + @parts[7] + @parts[9] + @parts[11] + @parts[13])) \% 10));$$
- In the case above:
 - zero pad to the left 0008048028002 to create a 13-byte root;
 - Remove the existing check digit (4)
 - Perform the following calculation to determine whether the check digit is correct
0008048028002
$$\text{checkDigit} = (10 - (((0+0 + 8 + 2 + 0 + 2) * 3) + (0 + 8 + 4 + 0 + 8 + 0)) \% 10));$$
$$\text{checkDigit} = (10 - ((12 * 3) + 20) \% 10));$$
$$\text{checkDigit} = (10 - ((36 + 20) \% 10));$$
$$\text{checkDigit} = (10 - (46 \% 10));$$
$$\text{checkDigit} = (10 - 6);$$
$$\text{checkDigit} = 4;$$
 - the 14-digit GTIN number is 000 80480 28002 4
 - the number that will probably appear on this item in the us is 0 80480 28002 4

Some UPC/EAN codes have special meaning and will not be in the database:

- Codes that start with "02" or "2" are for private use. They are locally-assigned codes that the stores used for conveying price and/or weight information. This means anybody (typically a retailer) that needs to assign a UPC to an item that doesn't already have one, can use any number system 4 UPC and be sure that it won't conflict with one assigned formally. So, such a UPC can and does mean something different depending on who you ask, and there's no reason to try to keep track of what products these correspond to. Typical examples would be random-weight packaged meat or produce.
- Codes that start with "4" are also locally-assigned codes and typically indicate a product that the store has on temporary special, where the store wants to override the public code or which has, for some reason, no public code at all. Examples might be in-store-produced sandwiches.
- Codes that start with "05" are for coupons. It is not uncommon that the balance of the code indicates the product to which the coupon applies, but this is by no means certain.



As a parenthetical note, some UPC/EAN codes are compressed and have to be unpacked before use. These are typically located in very small spaces and may consist of as few as 5 digits.

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The digit in the last position indicates where zeros are to be interpolated into the number and how many zeros should be interpolated. The code, once expanded, is the same as any other UPC/EAN code in format.

APPENDIX C: UPC/EAN COUNTRY CODES

Beginning	End	Country Name or Usage
0000000000000	0190000000000	United States
0200000000000	0290000000000	Restricted distribution (MO defined)
0300000000000	0390000000000	United States
0400000000000	0490000000000	Restricted distribution (MO defined)
0500000000000	0590000000000	Coupons
0600000000000	1390000000000	United States
2000000000000	2990000000000	Restricted distribution (MO defined)
3000000000000	3790000000000	France
3800000000000	3800000000000	Bulgaria
3830000000000	3830000000000	Slovenia
3850000000000	3850000000000	Croatia
3870000000000	3870000000000	Bosnia and Herzegovina
3890000000000	3890000000000	Montenegro
4000000000000	4400000000000	Germany
4500000000000	4590000000000	Japan
4600000000000	4690000000000	Russian Federation
4700000000000	4700000000000	Kyrgyzstan
4710000000000	4710000000000	Taiwan
4740000000000	4740000000000	Estonia

Beginning	End	Country Name or Usage
4750000000000	4750000000000	Latvia
4760000000000	4760000000000	Azerbaijan
4770000000000	4770000000000	Lithuania
4780000000000	4780000000000	Uzbekistan
4790000000000	4790000000000	Sri Lanka
4800000000000	4800000000000	Philippines
4810000000000	4810000000000	Belarus
4820000000000	4820000000000	Ukraine
4840000000000	4840000000000	Moldova
4850000000000	4850000000000	Armenia
4860000000000	4860000000000	Georgia
4870000000000	4870000000000	Kazakstan
4880000000000	4880000000000	Tajikistan
4890000000000	4890000000000	Hong Kong
4900000000000	4990000000000	Japan
5000000000000	5090000000000	United Kingdom
5200000000000	5200000000000	Global Office
5280000000000	5280000000000	Lebanon
5290000000000	5290000000000	Cyprus
5300000000000	5300000000000	Albania

Beginning	End	Country Name or Usage
5310000000000	5310000000000	Macedonia
5350000000000	5350000000000	Malta
5390000000000	5390000000000	Ireland
5400000000000	5490000000000	Belgium
5600000000000	5600000000000	Portugal
5690000000000	5690000000000	Iceland
5700000000000	5790000000000	Denmark
5900000000000	5900000000000	Poland
5940000000000	5940000000000	Romania
5990000000000	5990000000000	Hungary
6000000000000	6010000000000	South Africa
6030000000000	6030000000000	Ghana
6080000000000	6080000000000	Bahrain
6090000000000	6090000000000	Mauritius
6110000000000	6110000000000	Morocco
6130000000000	6130000000000	Algeria
6150000000000	6150000000000	Nigeria
6160000000000	6160000000000	Kenya
6180000000000	6180000000000	Côte D'Ivoire
6190000000000	6190000000000	Tunisia

Beginning	End	Country Name or Usage
6210000000000	6210000000000	Syria
6220000000000	6220000000000	Egypt
6240000000000	6240000000000	Libya
6250000000000	6250000000000	Jordan
6260000000000	6260000000000	Iran
6270000000000	6270000000000	Kuwait
6280000000000	6280000000000	Saudi Arabia
6290000000000	6290000000000	U.A.E.
6400000000000	6490000000000	Finland
6900000000000	6950000000000	China
7000000000000	7090000000000	Norway
7290000000000	7290000000000	Israel
7300000000000	7390000000000	Sweden
7400000000000	7400000000000	Guatemala
7410000000000	7410000000000	El Salvador
7420000000000	7420000000000	Honduras
7430000000000	7430000000000	Nicaragua
7440000000000	7440000000000	Costa Rica
7450000000000	7450000000000	Panama
7460000000000	7460000000000	Dominican Rep.

Beginning	End	Country Name or Usage
7500000000000	7500000000000	Mexico
7540000000000	7550000000000	Canada
7590000000000	7590000000000	Venezuela
7600000000000	7690000000000	Switzerland
7700000000000	7700000000000	Colombia
7730000000000	7730000000000	Uruguay
7750000000000	7750000000000	Peru
7770000000000	7770000000000	Bolivia
7790000000000	7790000000000	Argentina
7800000000000	7800000000000	Chile
7840000000000	7840000000000	Paraguay
7860000000000	7860000000000	Ecuador
7890000000000	7900000000000	Brazil
8000000000000	8390000000000	Italy
8400000000000	8490000000000	Spain
8500000000000	8500000000000	Cuba
8580000000000	8580000000000	Slovakia
8590000000000	8590000000000	Czech Rep.
8600000000000	8600000000000	Serbia
8650000000000	8650000000000	Mongolia

Beginning	End	Country Name or Usage
8670000000000	8670000000000	Korea, Peoples Rep
8680000000000	8690000000000	Turkey
8700000000000	8790000000000	Netherlands
8800000000000	8800000000000	KOREA, Rep. Of
8840000000000	8840000000000	Cambodia
8850000000000	8850000000000	Thailand
8880000000000	8880000000000	Singapore
8900000000000	8900000000000	India
8930000000000	8930000000000	Vietnam
8960000000000	8960000000000	Pakistan
8990000000000	8990000000000	Indonesia
9000000000000	9190000000000	Austria
9300000000000	9390000000000	Australia
9400000000000	9490000000000	New Zealand
9500000000000	9500000000000	Global Office
9550000000000	9550000000000	Malaysia
9580000000000	9580000000000	Macau
9770000000000	9770000000000	Serial publications (ISSN)
9780000000000	9790000000000	Bookland (ISBN)
9800000000000	9800000000000	Refund receipts

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Beginning	End	Country Name or Usage
9810000000000	9820000000000	Common Currency Coupons
9900000000000	9990000000000	Coupons