# GS1 Digital Link URI Syntax
## Fact Sheet

GS1 Digital Link standards bring the World Wide Web (WWW) and the GS1 system of identify, capture, and share, together. In simple terms, GS1 Digital Link URI Syntax standard provides a standard way of expressing GS1 keys and attribute data in a format that can be used on the web. That means that GS1 identifiers, such as the GTIN, are now a gateway to consumer information that strengthens brand loyalty, improved supply chain traceability information, business partner APIs, patient safety information and more.

GS1 Digital Link enables connections to all types of business-to-business and business-to-consumer information.

**Currently GS1 Digital Link standard is only approved for Retail POS and consumer interaction. GS1 is working towards a future where it can be used in other environments and sectors.**

The GS1 Digital Link standard is made up of many layers, this factsheet will focus on the first, and most basic layer which is the GS1 Digital Link URI syntax.

## What is a syntax?

A syntax is how things are arranged in a specific way to have meaning. GS1 currently has 4 different syntaxes which define how data is encoded into various data carriers. GS1 Digital Link URI syntax, the latest syntax, expresses data in a format that also can point to one or multiple resources on the internet. This makes it a useful syntax for web-based applications.

## Application Identifiers

Just like a phone number's area code, which is used to identify which state you are calling from; Application Identifiers are prefixes used in barcodes to define the meaning and format of the data that is following it. For example: AI (01) denotes Global Trade Item Number (GTIN) and has a fixed length of 14 numbers (data format n14). It would look like this:

```
(01)  09312345000005
```

There are over 300+ Application Identifiers and the full list can be viewed here.

GS1 Digital Link URI syntax uses the application identifiers in a web friendly format. It would look like this:

```
https://example.com/01/09312345000005
```

# Key Components of GS1 Digital Link URI syntax

## Scheme

The scheme indicates the protocol and is always http:// or https:// (use of HTTPS is more secure and is therefore recommended as best practice)

## Hostname

The hostname is typically a registered Internet domain name or a subdomain of such a registered domain name (e.g., example.com/ or id.gs1.org/). Some recommendations when deciding on the domain name are as follows:

1) **Use your brand's own internet domain**
   It is recommended that you build your GS1 Digital Link URIs using a domain name you own.

   **For example**: `https://www.example.com/01/09312345678907`

   The benefits of your own brand domain name include:
   - Consumers will be confident that the URL their mobile phone displays is owned by your brand and more likely to trust the link.
   - You will have direct access to, and ownership of any analytics captured by the website associated with your domain name, such as the frequency and locations at which the 2D barcode is being scanned.

   Your domain name is a brand asset that can be transferred if your brand is sold or acquired. This means that 2D barcodes containing your GS1 Digital Link URI would not have to be reprinted.

   There are solution providers that can take care of some of the more technical aspects of implementing GS1 Digital Link. Be aware of who is the owner of the data captured and who the owner is of the domain. When you want to switch to another solution provider's platform it is recommended to keep the same domain name if possible. This way the syntax, inside 2D barcodes, does not need to be updated.

2) **Set up a subdomain**
   It is also recommended setting up a subdomain wherever possible.

   A subdomain lets you separate portions of your site that warrant their own dedicated file structure, preventing you from having to set up a new site with a new domain that could result in confusion visitors. This would also reduce the risk of causing any disruption to your existing website.

   When creating a subdomain, it is recommended that you add an 'id' or similar prefix to your existing domain name to show this subdomain is about identification.

   **For example**: `https://id.example.com/01/09312345678907`

![GS1 Australia logo]

### 3) Keep it short

The shorter the GS1 Digital Link URI, the smaller the 2D barcode can be.

**For example**:
`https://id.example.com/gs1digitallink/productname/01/09312345678907`
is valid. This is because everything to the left of the actual GS1 identifiers is not part of the identification of the trade item, however, it will create a large 2D barcode.

It is recommended to add additional data such as expiry date, batch/lot code, etc. which can add value to your business case, instead of using a long domain name.

## Path information

After the domain, the remainder of the web URI is case sensitive.

1) **Primary Identification Key:** The next crucial element of your GS1 Digital Link URI is the GS1 Identification Key also called as the Primary identification key. Most products will already have GTINs allocated, a significant portion of which will be encoded in EAN/UPC barcodes that are printed on the product itself. This same GTIN needs to be encoded in the 2D barcode using GS1 Digital Link URI syntax.

For example: When your product is identified with the GTIN 9312345678907 the GS1 Digital Link URI syntax will look like `https://id.example.com/01/09312345678907`.

*Note: A GTIN expressed in a GS1 Digital Link URI will always start with application identifier 01 following the GTIN expressed in a 14-digit format. A GTIN-8, GTIN-12 and GTIN-13 should have leading zeros.*

You can have your GS1 Digital Link with just the GS1 Identification key only. When your business case requires additional information about the product to be encoded you can add them as described below.

2) **Key qualifiers:** These refer to those attributes such as batch/lot, serial number, consumer product variant that are designated for use as part of a compound key. They follow a specific sequence such that the specificity increases from left to right.

**Examples**:

`https://id.example.com/01/09312345678907/10/ABCD`

`https://id.example.com/01/09312345678907/10/ABCD/21/12345678`

The last examples show that first comes the identification key (GTIN), which is the class, followed by the batch/lot which is the sub-class and then the instance of the item which is the serial number.

3) **Data Attributes:** After the key qualifiers comes the data attributes such as expiry date, production date, count, price, net weight etc. These are added as query string in a URL. The order of the attributes does not matter.

**For example**:

`https://id.example.com/01/09312345678907/10/ABC123/21/456789A?3103=000195&3922=0299&17=201225`

## Summary

To summarise the structure of the GS1 Digital Link URI syntax is as follows:

`https://id.example.com/01/09312345678907/10/ABCDE?17=270905`

| Scheme | Subdomain/ | GS1 Primary Keys and | Attributes |
|---|---|---|---|
| | Domain name | Key qualifiers (in order) | (in any order) |

## Use re-direction

Another recommendation in terms of best practices is to use "redirection".

If you as the brand owner already have a webpage created for a particular product, and when you are adding a 2D barcode with GS1 Digital Link on the product. You don't need to create another webpage with the URL in the 2D barcode, you can simply redirect to the existing page. When the main website is changing you can easily change the redirection without changing the syntax in the barcode.

For example: `https://id.example.com/01/09312345678907` can be redirected to

`https://www.example.com/brand/productx/productinfo.html`

*Note*: The example.com domain name is used in the example as a place holder for any domain name.

## Scan this QR Code with GS1 Digital Link URI

When you scan this QR Code it will take you to a fictious product created by GS1.

## Resources

[GS1 Digital Link URI Syntax](GS1 Digital Link URI Syntax)