



dmreader

Data Matrix Reader for JavaScript Integration

Evaluation / Demo Version

Data Matrix Reader for JavaScript Integration - evaluation version-

Thank you for interest in our Data Matrix Reader Software Solution.

The Ufo Data Matrix Web Package : Reader is a software module that will empower your site or rich web application with the possibility of decoding 2D Data Matrix codes inside an online in browser environment.

Before using our Software, please read the instructions carefully and follow the examples to obtain the best results.

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KEY FEATURES

- decodes 2D Data Matrix square codes;
- embeddable in a HTML/JavaScript browser environment;
- JavaScript communication interface;
- offers methods and properties for starting and stopping the decoding stream;
- returns the decoded string through a JavaScript function call;
- provides an interface for Javascript calls/call-backs;
- comes as a SWF compliant file
- runs under the Adobe Flash Player 10 Run-time;
- detects 1x1 Data Grid ECC200 Data Matrix markers.
- decodes error corrected ASCII, C40, Text (Encoding Schemes) encoded information.
- accompanied by usage examples or public method and property specification documents
- accepts size, camera, timing, smoothing public parameters



TARGET SYSTEM RECOMMENDATIONS

These system specifications are recommended in order to build up a strong end-user experience for applications embedding "Ufo DM Web Package Reader" component. They do not represent a minimal requirements specification.

- Adobe Flash Player 10 Run-Time, with support and permissions for camera access.
- webcam supporting a resolution of 640 x 480 at 30 FPS.
- 1.6 GHz "Core" Class CPU.
- minimum 1GB System Memory (RAM).

HTML / JAVASCRIPT EMBEDDING

Working with the JavaScript interface implies a `barcodeRead(code)` callback function called by the Flash component. If this function isn't defined or doesn't return the "ok" string JavaScript interface calls shall be stopped for the duration of the decoding session. The other two functions (`StopDecoder()` and `StartDecoder()`) are calls from JS to Flash which can be used to obtain the desired behavior from the Reader component.

These function can be defined in a JavaScript file which is imported in the HTML page (`<script src= "./scripts/dmreader.js" type = "text/javascript"> </script>`) or which can be directly defined in the HTML page inside the `<script>` tag.

`barcodeRead(code)` - this is a JS call function from Flash. The function is called whenever a code is detected. Once a code is detected, the Flash decoder waits for `jsi` seconds (default 2000ms) before making another call (only when a code is continuously found). This function must return "ok" in order to have a call confirmation. Optionally, in this time interval the `StopDecoder` function could be called or the decoder can be unloaded/hidden/destroyed/etc.

```
function barcodeRead(code)
{
    document.getElementById("codearea").innerHTML = code;
    return "ok";
}
```



StopFlashDeccoder() - this is a JS callback function JS -> Flash. It puts the decoder on hold without destroying it. It only works after the user allows the camera to capture from Flash (Adobe Flash Player settings -> allow). The decoder is started automatically once webcam rights are granted.

```
function StopFlashDecoder()
{
    GetSwfDecoder("dmreader").StopDecoder();
}
```

StartFlashDeccoder() - this is a JS callback function JS -> Flash. It starts the decoder if it was put on hold by StopDecoder. It only works after the user allows the camera to capture from Flash (Flash Player settings -> allow).

```
function StartFlashDecoder()
{
    GetSwfDecoder("dmreader").StartDecoder();
}
```

GetSwfDecoder() - gets the embedded element object. Useful function to get an swf object.

```
function GetSwfDecoder(swfName)
{
    if (window.document[swfName])
        return window.document[swfName];

    if (navigator.appVersion.indexOf("MSIE")!==-1)
        return document.getElementById(swfName);

    return document[swfName];
}
```

DATA MATRIX READER – PARAMETERS

| Parameter | Default Value (units) | Description |
|----------------|-----------------------|--|
| cw | 640 (pixels) | Camera Width |
| ch | 480 (pixels) | Camera Height |
| cfps | 30 (fps) | Camera Frames Per Second |
| capi | 40 (ms) | Video Stream Capture Interval |
| jsi | 2000 (ms) | JavaScript Code Refresh Interval |
| vmi | 1000 (ms) | View Marker Interval |
| color | 13434624 (24 bit rgb) | Marker Overlay Color |
| visible | true | Show Detected Code Over Marker Overlay |
| smooth | false | Displayed Video Stream Smoothing |



All parameters can be set when embedding the object in a HTML page. They are passed through the string that sets the value of the `<param>` tag with `name="movie"` and the `src` property or the `<embed>` tag. The string is formatted in the following way:

```
"DMReaderSwfURL?parameter01=value01&parameter02=value02 ..."
```

DMReaderSwfURL refers to the address where the Ufo DM Web Package Reader is on the server. The possible parameters, alongside their default values (when they are not explicitly set) are defined in the previous table. The Flash Component runs under remote Security SandBox type, so it will not run locally. **Testing and using the Reader requires a server type environment.**

The **Camera Width** and **Height** have a major impact in decoding accuracy (the bigger the resolution, the better the detection) but also affects the overall performance of the application, as a larger image has to be processed. By setting the camera resolution you set the actual resolution used in the detection process; the cam resolution can differ from the one displayed in the actual Reader. The **Camera FPS** is usually set to 30 fps, but this property is highly dependent on the actual hardware properties of the webcam (most webcams have support for 30fps at 640x480). If the camera doesn't have support for the set fps at the used resolution the value for the fps will automatically be reduced.

The **Video Stream Capture Interval** is an important parameter in the overall performance of the application (lower means more fps and smoother detection, but only on capable hardware) and is given in milliseconds (at 40ms the reader tries to detect at 25FPS = 1000ms / 40ms); for machines with lower or average specs it is recommended to increase the value. When setting this parameter you should keep in mind the target user's hardware, decreasing the camera resolution you process/detect at higher FPS (lower capture intervals).



JavaScript Code Refresh Interval refers to the minimum interval (in milliseconds) between two consecutive JavaScript calls for the same detected code. This means that if the same code is found let's say 60 times in 3 seconds (at 20 fps detection - capi=50) the reader executes only 2 JavaScript calls (at jsi =2000) to the detection function. The main purpose behind this feature is to not uselessly overload the server with navigateToURL calls, which are slow.

The **Marker** refers to the color quadrilateral drawn over the found code. **Marker Overlay Color** can be set as a 24 bit integer (ex: 13434624 = #CCFF00 in hex). The **View Marker Interval** refers to how long will the marker be shown after a detection, this offers a more continuous visual experience (if one or two frames are dropped at a 25fps detection, the end user shall not feel this, as the marker is drawn even during these frames). Over the Marker the detected code is also drawn, if you do not wish for the user to see this code set the **visible** parameter to false. Setting this parameter to false will also hide the decoded text from the transparent bar at the bottom of the Reader.

The **smooth** parameter affects the quality of the shown video stream and has no effect on the quality of the detection. Setting this parameter to true will also affect the overall performance of the application (it uses quite a lot of the CPU capabilities). We recommend it when using a lower camera resolution displayed at higher one (cam capture at 320x240 shown in browser at 640x480) or when the target machine disposes of enough hardware capabilities.



The **width** and the **height** of the actual Reader shown in browser are set as properties of the `<object>` and `<embed>` tags. Camera capture image is scaled and cropped automatically to fit into the displayed size (e.g. if you have set a camera resolution of 640x480 and a display size of 320x120, the actual decoding will be made on a resolution of 640x240 and shown in 320x120).

Here is a simple HTML embedding example setting a few parameters.

```
<object classid = "clsid:d27cdb6e-ae6d-11cf-96b8-444553540000"  
        width = "640"  
        height = "360"  
        align = "middle">  
  
    <param name = "quality"           value = "high" />  
    <param name = "scale"             value = "noscale" />  
    <param name = "salign"            value = "lt" />  
    <param name = "bgcolor"           value = "#000000" />  
    <param name = "allowScriptAccess" value = "always" />  
    <param name = "movie"  
        value = "../reader/dmreader.swf?cw=320&ch=240&deti=20"/>  
  
    <embed src = "../reader/dmreader.swf?cw=320&ch=240&deti=20"  
          bgcolor = "#000000"  
          width = "640"  
          height = "360"  
          quality = "high"  
          align = "middle"  
          type = "application/x-shockwave-flash"  
          allowScriptAccess = "always"  
          pluginspage="http://www.macromedia.com/go/getflashplayer"/>  
</object>
```



DATA MATRIX READER – NOTES

The actual intervals may vary due machine, browser and run – time environment issues.

By adjusting the parameters you can get a smooth user experience even on slower machines

Decoding accuracy is highly dependent: on image or video quality under specific lighting conditions, on marker printing quality, positioning and on camera capabilities.

If you encounter any issues in using our software please feel free to contact us.

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Tags Republic
Ufo Media Design SRL
contact@tagsrepublic.com
www.tagsrepublic.com

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