

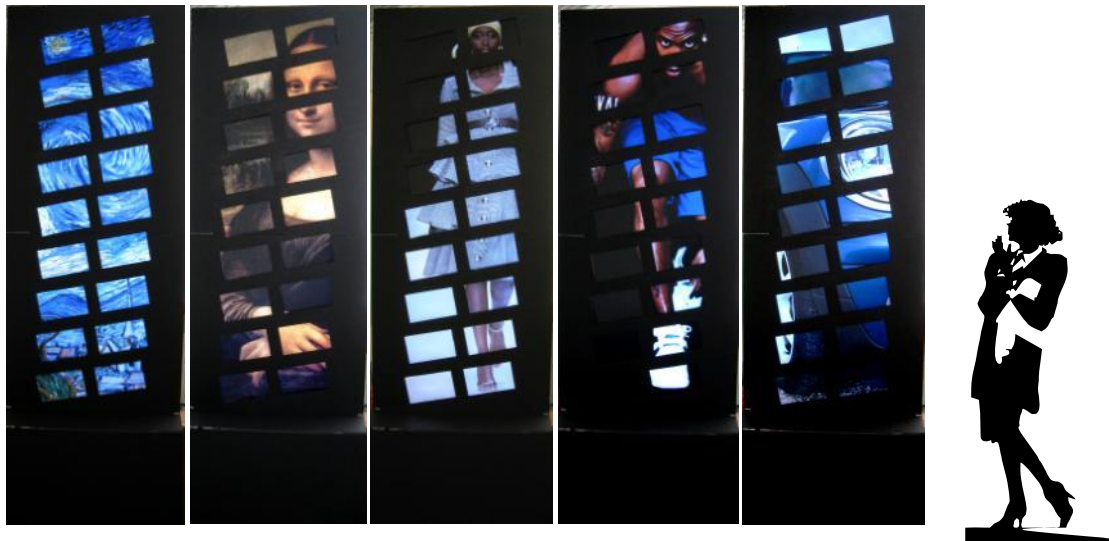
Digital Signwall Construction Guide

An Application Note

IAdea Corporation

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What is a Signwall?



Actual photo shots (lady silhouette to scale)

The IAdea Digital Signwall is a system comprising of an arbitrary number of individual IAdea Digital Signboards to create an immersive still image viewing experience and great visual impact.

The signboards making up the signwall system can be synchronized to flipping static images to within +/- 1 second, allowing showing larger-than-life graphics. Individual signboards can be placed in any arrangement (size and shape) to create the desired visual effect. There is no technical limit to the number of screens that can be used.

In this document we describe the construction of a Digital Signwall in the 9x2 array arrangement.

The 9x2 Signwall

The 9x2 Signwall as shown in actual photos at the top measures 34' (260 cm) tall, 10.5' (80 cm) wide and 6.5' (50 cm) deep. The display area has its long diagonal measuring 71' (180 cm). It is ideal for placing on vertical columns in open space (such as shopping malls, retail stores, galleries, restaurants, etc.).

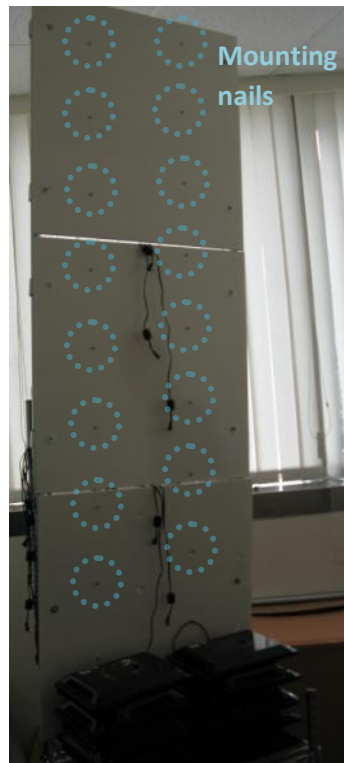
Construction

Bill of Material

- IAdea XDS-101/104 Digital Signboards x 18
- Back panel (180 cm x 60 cm), capable of holding 25KG of weight x 1
- Stand, capable of holding 25KG of weight x 1
- Front panel (200 cm x 80 cm), light weight (e.g., foam core material) x 1
- Nails x 18
- WiFi router x 1
- Power strips
- Adhesives

The Making

1. Fix nails on the back panel so the nail would hang each individual signboard to form the 9x2 arrangement with each screen optionally tilted at an angle (for aesthetics only);
2. Mount all signboards. Apply adhesives if necessary to fix each signboard at the desired angle (never support the weight of the signboard solely with the adhesives);



3. Plug each power adapter into the individual signboards before mounting the front panel. Arrange power cords so the power adapters can be connected into power strips at the end;
4. Mount the front panel over the signboards;
5. Connect power, WiFi, and voila! Done!

Theory of Operation

Each signboard has a built-in RTC (real-time clock) that is synchronized with an HTTP server each time the player updates its playlist (SMIL script). Within the SMIL script, playback is synchronized to the “wall clock” time which is referenced from the RTC, thereby synchronizing the slideshow.

Why the +/- 1 Second Discrepancy

The player uses the HTTP “Date” response header (mandatory for all web servers) to set its RTC. It has a resolution of 1 second. Also due to server load conditions there can be delays between when the server generates the Date header and when the response actually gets sent to the player.

Sample SMIL Playlist

The following SMIL shows a “synchronized” loop of 6 JPEGs in a slide show, each displayed for 10 seconds.

```
<smil>
  <head>
    <meta http-equiv="Refresh" content="300" />
  </head>
  <body>
    <par>
      <seq repeatCount="indefinite">
        <ref dur="60s" />
        <prefetch src="S0_R5C0.jpg" />
        <prefetch src="S1_R5C0.jpg" />
        <prefetch src="S2_R5C0.jpg" />
        <prefetch src="S3_R5C0.jpg" />
        <prefetch src="S4_R5C0.jpg" />
        <prefetch src="S5_R5C0.jpg" />
      </seq>
      <excl dur="indefinite">
        <priorityClass peers="stop">
          <seq begin="wallclock(R/00:00:00.000/PT60S)" dur="indefinite">
            
          </seq>
          <seq begin="wallclock(R/00:00:10.000/PT60S)" dur="indefinite">
            
          </seq>
          <seq begin="wallclock(R/00:00:20.000/PT60S)" dur="indefinite">
            
          </seq>
          <seq begin="wallclock(R/00:00:30.000/PT60S)" dur="indefinite">
            
          </seq>
          <seq begin="wallclock(R/00:00:40.000/PT60S)" dur="indefinite">
            
          </seq>
          <seq begin="wallclock(R/00:00:50.000/PT60S)" dur="indefinite">
            
          </seq>
        </priorityClass>
      </excl>
    </par>
  </body>
</smil>
```

```
</body>  
</smil>
```

Content Generation

Before each signboard can play its correct portion of the “larger picture,” the graphics must be cut into smaller JPEGs in 800x480 resolution and rotated to the angle matching each signboard placement. Photo editing tools such as Adobe Photoshop can be used. Also IAdea supplies the optional “IAdea Signwall Controller” software that allows fast generation of the JPEGs.

Advanced Usage: Combining Videos

In the SMIL sample above, each tag can be replaced with a <video> tag to play a video during the time slot. However, several issues exist when playing videos on the digital signboard:

- Due to the signboard’s very low-power CPU, it can take anywhere from 2 to 5 seconds for a video to start
- It can take another 2 to 7 seconds for a video to properly stop
- In short, do not count on the videos to be synchronized to each other, and
- Leave plenty of “black filler” at the end of each video time slot to buffer for the unpredictable delays.