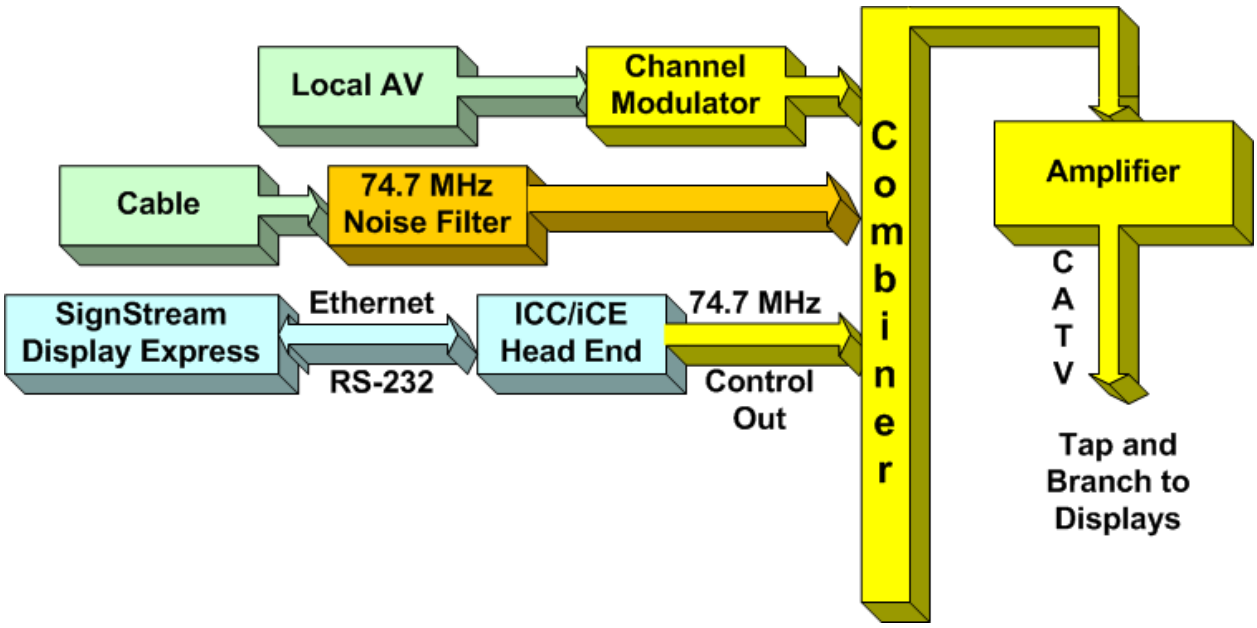
RF Display Control Tips

RF Design and Installation



The architecture of a Contemporary Research SignStream Media Express or Display Express display control system follows the same design as a standard RF local insertion system. A key aspect of the system is that the underlying iC-Net technology is compatible with most existing RF systems, and control channels used for display operation will not conflict with current TV channels or sub-channels.

- Local AV, including:
  - AV sources, digital cable or satellite recievers feeding analog modulators
  - Off-air HDTV channels inserted as digital QAM channels
  - HD sources feeding HD cable modulators
  - SignStream HDTV channels
- Cable Feed, using a noise filter, if needed
- SignStream or Display Express control, inserted as micro control channel

Local Sources and SignStream Server

Each local AV source feeds an RF modulator. Analog video sources, such as DVD players, or a PC that runs standard 4:3 digital media such as digital videos or a PowerPoint information channel, feed the AV output of the source to an analog channel modulator. It's best to use an agile modulator, so you can set the channel as needed for the installation.

A SignStream server can have up to 6 internal channel modulator card, each broadcasts a digital HDTV ATSC channel, as well as a simultaneous analog TV channel.

There are many ways to balance the channels, depending on the design of the system. Obviously, the output of some channels will be reduced, while others are amplified.

Display Control Software

There are several ways that CR display networks can be controlled:

- Display Express software connected to an ICC-HE Head End. The Web-based control software can be accessed anywhere on a network, usually located adjacent to Head End.
- SignStream Media Player connected to the ICC-HE Head End via RS-232 (It's usually in the same rack as the Head End)
- Custom software, running on an AMX, Crestron, or other control system, often connected to an ICE-HE Ethernet Head End over a network.

ICC Head End

The Display Control software communicates with the displays through the same RF coax wiring that carries the TV channels. An iC-Net Head End receives commands via RS-232 or Ethernet and broadcasts the data as a small control channel between Channel 4 and 5, at 74.7 MHz. As we note below, the RF output of the Head End will need to be trimmed to match the other RF sources.

Combining Outside and Local Sources

The Cable/Antenna feed, and the in-house channels connect to an RF Combiner, which merge all the outputs into a single combined RF output. The key design element in combining channels is that the output level of each the RF feed needs to be the same. Typical RF levels include:

- RF Modulator – 45-55 dBmV
- Cable Feed – 15 dBmV
- iC-Net Head End – 50 dBmv
- SignStream Card – 22 dBmV

1-way and 2-way Control Options

A majority of Contemporary Research installations are 1-way control systems. In this application, the control software sends out commands, but never seeks a response. The iC-Net RF control structure is highly reliable, so status checks are rarely required.

iC-Net can also be configured as a 2-way network, often required for educational media systems that respond to interactive classroom control commands. For those systems, a Sub-CATV Diplexer is inserted after the system amplifier. This component passes the TV channels and control commands forward, and diverts status feedback from iC-Net controllers back to the iC-Net Head End. The Head End then passes the information back to the control application for processing.

Display Controllers

After the RF amplifier, the RF coax system branches out to the displays in the facility. Most RF systems are designed so that each TV receives an RF level of about 10-12 dBmV for proper channel tuning. Because the control signal is a micro-channel with far less information than a TV channel, the controllers often work even if the display can't effectively tune channels.

Display Controllers are identified on the RF network by unique addresses. There are 4,000 possible addresses, divided into 15 zones. All the controllers within the same zone respond immediately to a single zone command. Some systems use a simple architecture, using the same address for all controllers in the same zone. As control for specific controllers may be needed in the future, it's usually a good practice to assign each a unique address.

iC-Net Zones

Zone	Address	Zone	Address	Zone	Address
1	256	6	1536	11	2816
2	512	7	1792	12	3072
3	768	8	2048	13	3328
4	1024	9	2304	14	3584
5	1280	10	2560	15	3840
All	4095				

Bang, then Hang

Integrators will often have one team install all the displays, leaving all the device setup work for the follow-up team. Not the best plan for display control systems, where displays can be mounted in hard-to-reach locations and controllers can be hidden behind the displays.

Plan your address scheme and set controller numbers before installation. Use a label to mark the location and address of the controller. It's also a good idea to test a sample display/controller combination to cross-check settings and cable wiring.

Setting DIP Switches

Most display control systems employ the ICC1-232 or ICC1-IR for display control. There are two sets of DIP switches on the bottom of each controller. They are used to set the device number (network address) or control code type. In most cases, CR has already set the control code type, or you can define through Display/Media Express software – so most installers will use the switches for setting the address only.

Generally speaking, the second set of switches (S2) set the Zone address for zones 1-15. The top switches (S2) set the unique address of the controller. If the system will always use Zone commands for displays, you may never need to set the individual address.

S1	Off Value	On Value
1	0	1
2	0	2
3	0	4
4	0	8
5	0	16
6	0	32
7	0	64
8	0	128
S2		
1	0	256
2	0	512
3	0	1024
4	0	2048
5		
6	**Device Mode**	
7		
8		

Device Number Setting

Zone Switch Settings

To define the controller's Zone, use the following pattern of switches ON for the S2 DIP.

Zone	Value	1	2	3	4
		256	512	1024	2048
1	256	X			
2	512		X		
3	768	X	X		
4	1024			X	
5	1280	X		X	
6	1536		X	X	
7	1792	X	X	X	
8	2048				X
9	2304	X			X
10	2560		X		X
11	2816	X	X		X
12	3072			X	X
13	3328	X		X	X
14	3584		X	X	X
15	3840	X	X	X	X

Controller Switch Settings

The unique address of the controller is the combination of the values of the Zone (S2) and Unit (S1) switches. For example, the first controller in Zone 1 would be set to Zone 1 (256) in S2 and 1 (1) on S2, or 257. To control all the displays in Zone one, Display Express sends a command to device 256. To control just the first unit, create a Preset addressed to 257.

Installation Process and Documentation

Most dealers will pre-configure the controller's address before hanging displays. After setting the address, use a label that states the unit's address and location. Some use this method:

Room 305 - 515 - 12/2

The first identifies the location/name of the display. The second shows the specific address. The last set shows the switches in S1/S2 that are set to ON.

It's a good idea to define all this first in a spreadsheet, with the columns defining the name, address, S1 and S2 ON settings. Then, one person can set up all the controllers and label them.

Once the controller is configured and labeled, it's easier for less-trained installers to Velcro the controller on the back of the display, provide power, and hang the displays.

It's much easier to pre-configure ahead of time than perform the task once the displays are installed.