

Resource – TV Solutions – Integrated TV including IPTV

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The purpose of this resource will be to gain a basic understanding of Integrated TV systems including IPTV solutions.

Identify the TV Type

The first step in troubleshooting TV issues should always be to identify what type of TV the customer has. Each TV system we offer is very different and the troubleshooting does not directly apply from one system to another.

For Integrated TV and IPTV - the Serial Number prefix (product code) from the console will help to determine what type of integrated TV it has. See the [tuner descriptions](#) below once the console type has been identified.

Integrated TV (Matrix and Vision)

Integrated TV means the TV picture is shown on the same screen as the workout information. Examples of units with this TV option are Matrix 7XE/7XI & Touch/Touch XL consoles. The console has a TV Tuner inside of it. A TV tuner receives the TV signal via a Coax cable and sends the image to the console's screen. It works much like your home television. On the console there is an app that is selected to display the TV picture.



Vision 600E consoles are sold with the option to purchase a TV tuner which would enable the console to display integrated TV. The tuner used is referred to as the US5 tuner. This tuner is for encrypted and unencrypted signals. Analog Specifications: NTSC. Digital Specifications: ATSC (QAM), Pro:Idiom. The NTSC/ATSC/QAM signals and Pro:Idiom signal both use coax cable for distribution.



Tuner Descriptions

MX Touch/Touch XL Tuners

Tuner Name	Function	Note
US4	Pro: Idiom encrypted, signal input - Ethernet	Discontinued
US5	ATSC, Pro: Idiom encrypted, signal input - Coax	
US6	ATSC/NTSC, signal input - Coax	
US7	Pro: Idiom encrypted, signal input - Ethernet	Used in Touch/XL Base only
US8	Pro: Idiom encrypted, signal input - Ethernet	Replaced US4

MX Legacy Console Tuners

****Coming soon****

Vision Tuner

Tuner Name	Function	Note
US5	ATSC, Pro: Idiom encrypted, signal input - Coax	

Signal Meanings

Pro: Idiom is a brand of encryption. Encryption refers to a security method for Internet connection generally used by hotels to prevent the theft of data. Systems will either be encrypted (Pro: Idiom) or unencrypted (non-Pro: idiom).

ATSC (Advanced Television Systems Committee) standards are an American set of standards for digital television transmission over terrestrial, cable and satellite networks.

NTSC (National Television System Committee) is the first American standard for analog television and later adopted the digital television transmission over terrestrial, cable and satellite networks.

QAM (quadrature amplitude modulation) is a method of combining two amplitude modulation (AM) signals into a single channel. This approach helps double its effective bandwidth.

Tuner

The tuner is the device that takes the information from the coax cable and sends the image to the screen on the console and the audio to the earphone board in the console. The tuner is where the coax cable screws into. It is inside the console so it is easily identified by the coax cable going into it. Every TV has a tuner even home televisions have tuners. Every tuner has a specification for what the signal strength is that they are able to use.



The tuner has a coax cable port to bring the signal in. On the US5, and US6 tuner shown above there are USB & HDMI ports that can be used to bring the signal to the UCB. Some tuners appear different, but there will always be a coax cable to bring the signal into the tuner.

The HDMI port is an “OUT” port only. You cannot plug an HDMI from a cable provider’s set top box into this port. The HDMI coming out of this port must go directly into the UCB.

Coax Cable

The coax cable is where the audio and video signal travel. It comes on a roll and is run throughout the facility to everywhere where a TV will be. This is part of the facilities structure and is not our responsibility to support, but because it is a critical component, we occasionally need to troubleshoot it to confirm if it is good or bad. There is a short length of coax cable inside the frame that travels up to the tuner inside the console. This is the only coax cable that Matrix is responsible for.



There are different levels of quality of coax cable and connectors. For our TV’s we require Dual-Shielded RG-6 coax with F-Type compression fittings. More information on this can be found in the *Power and Technology Requirements* document in the TV Cabling and Signal Requirements section.

Helpful Resources - Integrated TV

The first helpful resource are the titles found in Order View for MX consoles. Using these titles combined with your Serial Number prefix will help you to determine which type of TV the console has. Perhaps it is IPTV. Checking this first will eliminate any room for error.

Order View

[TM756D Touch US6 \(std NA\)](#)
[TM756C Touch US5 \(ProCoax2\)](#)
[TM756B Touch US4 \(ProIPTV\)](#)
[TM756H\(2108 & Before\) Touch US4 \(ProIPTV\)](#)
[TM756I Touch Console US5 \(ProCoax2\)](#)
[TM756J Touch Console US6 \(std NA\)](#)
[TM756U Touch US8 \(ProIPTV\)](#)

Troubleshooting – *IPTV & TV Tuners* is an expansive troubleshooting document which can be found in the Troubleshooting Guides section of the product page.

Troubleshooting Guides

[Digital Products \(NB-1911008\)](#)
[IPTV & TV Tuners](#)
[Master Error Code List \(NB-1903010\)](#)
[Touch / Touch XL Console](#)
[Touch / Touch XL Software Improvements \(NB-2108004\)](#)
[Touch/XL Console TV & CAB](#)
[Power and Technology Reqs \(NB-2012006\)](#)
[TV Picture Issues](#)

TV Menu / Channel Scanning – See the Service Guide (Legacy) or Troubleshooting Guide on the console's product page.

Signal and hardware requirements – See the *Power and Technology Requirements* document in the Troubleshooting Guide section on the consoles product page.

600E tuner installation – See the video in Online Remedy and work instructions on the product page.

600E troubleshooting - Review the *600E Console TV & CAB* document as well as the *TV Picture Issues* on the product page in Online Remedy.

Frequently Asked Questions – Integrated TV (Coax Distribution)

What is a signal?

- A TV signal is simply the transmission of data from one end of a coax cable to the other.

What is the source of the signal?

- The source of the signal comes from a cable provider. They bring the source from a nearby telephone pole or ground level box. Because of this the cable company/ TV provider is only responsible for the signal getting to the perimeter of the building.

How does the signal get split for multiple TVs within the building?

- Another part of the coax cable infrastructure is devices called taps and splitters. These devices will divide the signal from one line to 2,4,6 or more lines. In addition to creating additional pathways for the signal to travel it will also weaken the signal strength.

Can a signal be too weak or too strong?

- Yes, a signal can be too weak or too strong. If the signal is too weak it can cause issues of no image, no audio or poor image or audio quality. If a signal is too strong it can cause the tuner to prematurely fail due to the excess of signal going into the tuner.

How is a signal measured?

- The standard for measuring signal strength is called dBm. This is a measurement of the power of the signal. It can be measured using a generic Television signal meter.

Where do you measure the signal strength?

- The signal strength gets weaker and the dBm will decrease as it travels from the source through long coax cables. Because of this drop in signal the only place to measure that is reliable is directly before the coax enters the unit.

Can you raise signal strength?

- Signal strength can be raised by using devices known as amplifiers, but because of the use of taps and splitters to divide the signal the amplifier must be placed prior in line to the splitters and taps so that it can raise the signal strength evenly for all TV's.

How often is the TV provider responsible for signal strength issues?

- The TV provider is never responsible for signal strength issues. The only issue that may be experienced due to a provider issue is a complete outage. They will have no TV throughout their entire facility and neighboring buildings will also lose television. This is uncommon.

How often do tuners go bad?

- Tuners rarely go bad especially if the signal being fed to them is within specifications. The exact specifications can be found in Power and Technology Requirements Document in the TV Cabling and Signal Requirements section.

How often is the issue due to the facilities coax cable infrastructure?

- This is the single most common cause of television issues. It is important to test signal strength at the tuner and if signal strength is not meeting the specifications set by Power and Technology Requirements Document in the TV Cabling and Signal Requirements section we advise the customer to make these improvements.

Is there a way to prove to the customer that the issue is not our equipment?

- A reliable way of proving to the customer that the issue is not the fault of the equipment is to do a "Home-Run" Which means the technician will unhook the line going into the amplifier if one is installed / or to the first splitter / tap if they do not have an amplifier and disconnect all other tv's from the infrastructure and run one long line of coax cable to one single unit. Eliminating all amplifiers, splitters, taps and potential defects to their existing coax cable. If the units TV functions as normal we have effectively proved that the unit is operational.

IPTV

IPTV stands for **I**nternet **P**rotocol **T**ele**v**ision, which is a system that streams the TV channel through a wired Internet connection. It uses a special tuner to decode the signal and stream it to the console. IPTV works by taking a signal from the television provider and converting it into digital data, which is then transmitted over the internet. A channel list provided by the customer is programmed into the console. The data is then decoded by the tuner connected to the console.

Ethernet Cable

The Ethernet cable is where the audio and video signal travel. It comes on a roll and is run throughout the facility to everywhere where a TV will be. This is part of the facilities structure and is not our responsibility to support, but because it is a critical component, we occasionally need to troubleshoot it to confirm if it is good or bad. There is a short length of Ethernet cable inside the frame that travels up to the tuner inside the console. This is the only ethernet cable that Matrix is responsible for.



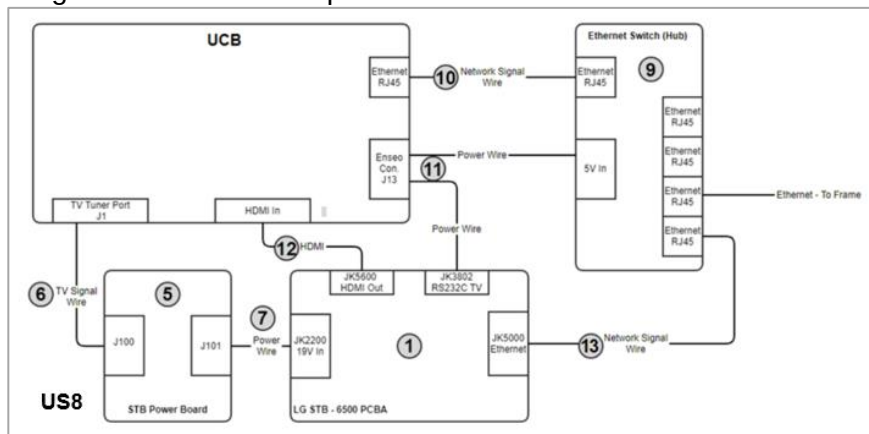
Note: US5 tuner uses coaxial cable for signal distribution for Pro: Idiom IPTV signal.

Tuner / Set Top Box (STB)

The tuner, sometimes referred to as a Set Top Box, is the component that decodes the programming signal. There are a variety of these tuners available depending on the type of signal and type of cable used in the customer's infrastructure. The console serial number will tell what type of tuner is inside the console. In some cases, the tuner is supported by auxiliary components such as an ethernet switch and/ or power converter. because these components are adapted to fit into the console based on the customers' needs and the current available technology.

Additional components will be part of the facilities infrastructure and therefore the customer's responsibility to set up, troubleshoot and maintain.

Below is the US8 tuner components inside a console. Components may not in the location shown however, the image shows where components connect.





US4, US7, US8



US5, US6

Channel Import

US4, US7, US8 and Unencrypted IPTV tuners need to have the customers channel list imported into the console. If a customer changes their channel lineup, a new file will need to be created and imported into each console.

See *SOP – Customer Service – Matrix Customer IPTV Channel List* for details on how to create the import file.

Helpful Resources - IPTV

Determining tuner type - The first helpful resource are the titles found in Order View. Using these titles combined with your serial number prefix will help you to determine which type of integrated TV / IPTV the console has installed.

Order View

TM756D Touch US6 (std NA)
TM756C Touch US5 (ProCoax2)
TM756B Touch US4 (ProIPTV)
TM756H(2108 & Before) Touch US4 (ProIPTV)
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Troubleshooting - IPTV & TV Tuners document is an expansive troubleshooting document which can be found in the Troubleshooting Guides section of the product page.

Marriott IPTV Console Solutions

What	SAP	Tuner Type	Signal Distribution
MX Touch	MTM1635-00US	US5	Coaxial
MX Touch XL	MTM1638-00US	US5	Coaxial
MX Touch	MTM1634-00US	US4/US8	Ethernet
MX Touch XL	MTM1637-00US	US4/US8	Ethernet
2020 TV-15.6" Matrix MYE	ZMD4009918	Pro:Idiom chip tuner	Coaxial

At times, Marriott will have quotes for consoles that are given. Before the quotes move to a sales order, the location changes their signal distribution. If the client wires IPTV for US4/US8 and somehow purchases Pro:Idiom COAX (US5) consoles, inform them to contact their GRE provider (GuestTek, Sonifi, Enseo, or WorldCinema) about this solution: **QAM 14 card to duplicate 40 HD channels (which converts IP to Coax).**

Frequently Asked Questions - IPTV

What is a Set Top Box and why are some inside the console and some outside of the console?

- A set top box is a device that can receive and decode digital television signals. When the set top box is located **inside** the console it is often referred to as a tuner and will be used in an IPTV setup. Set top boxes located **outside** of a console are cable set top boxes and will be used in a non-IPTV system. These boxes are provided and maintained by the cable television provider.

What is Encrypted vs. Unencrypted and how is that different from Pro: Idiom?

- Pro: Idiom is a brand of encryption. Encrypted refers to a security method for Internet connection generally used by hotels to prevent the theft of data. Systems will either be encrypted (Pro: Idiom) or unencrypted (non-Pro: idiom).

How often do tuners go bad?

- Tuners rarely go bad especially if the signal being fed to them is within specifications. The exact specifications can be found in Power and Technology Requirements document in the TV Cabling and Signal Requirements section.