

Televes®



coax
DATA
1Gbps

Ref.7689/768973
Coaxdata™ 200Mbps

Ref.769201/769202/769203
Coaxdata™ 1Gbps

EN Application Notes for Coaxdata™

**Collective Installation
Certification**

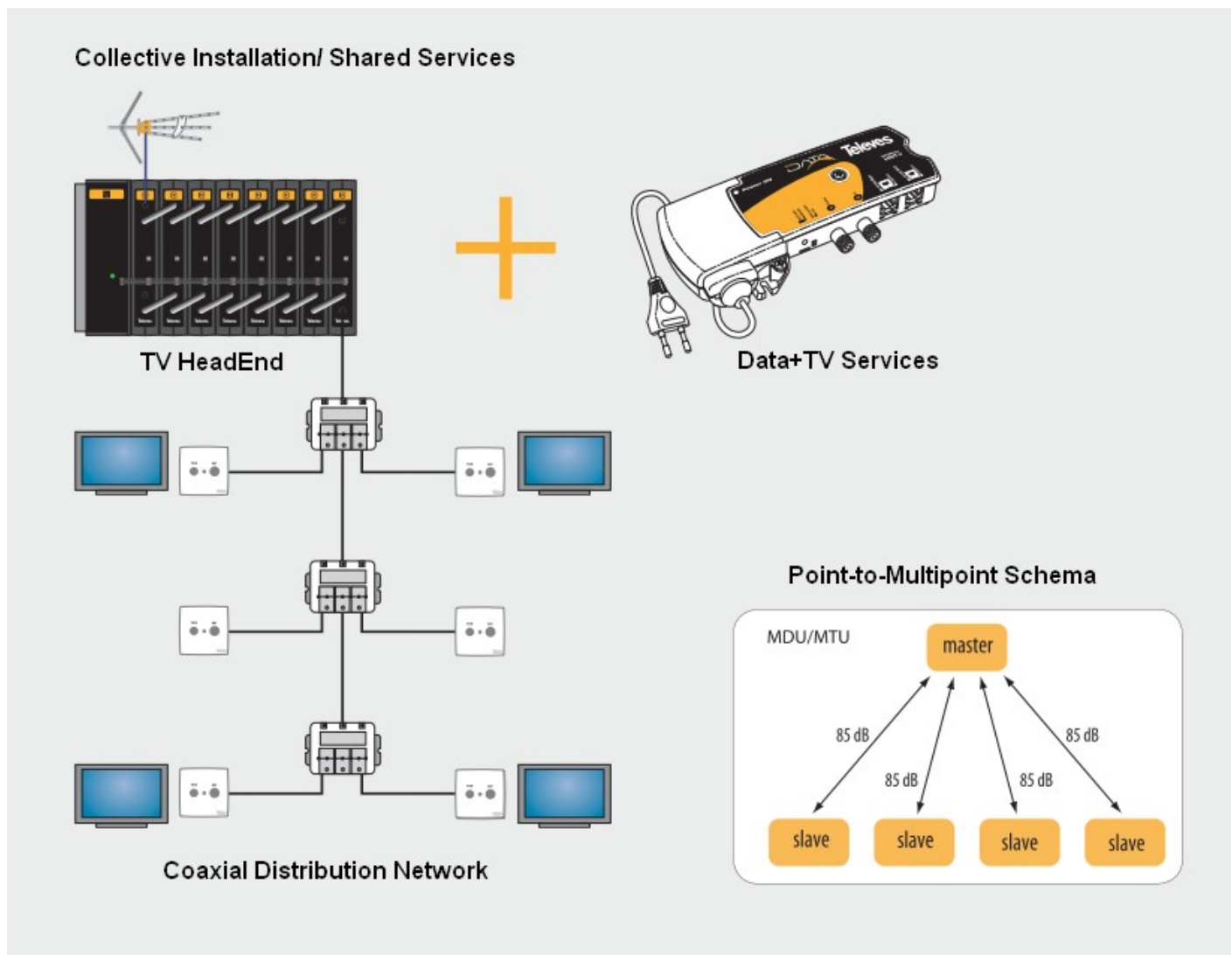
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Introduction

This manual describes the steps that would be necessary to undertake a possible collective installation with CoaxData product ranges. For networks Collective (MxU) means those installations in buildings made for TV distribution shared among several users, and where the network meets the following characteristics:

- The network is composed of a header providing TV services.
- There is a network of distributors and taps that carry the signal to the sockets.
- The attenuation between the header and the outlets of the installation must be less than 85 dB.
- There is no limit to the attenuation between different shots (coaxial Only Mode Hidden Node).



In these cases, you can undertake the installation to service data on the existing coaxial infrastructure. To ensure the installation and to certify this document proposes a number of steps before installation, and upon completion, a number of software measures (CoaxManager), certifying the possible installation.

Analyze coaxial network and Measurement Equipment

To perform the measures should be have the following elements:

- Field Meter: H45/H60 Series
- **Coaxdata 1Gbps**: Gaussian noise generator Ref.5930, Diplexer Filter 1-68MHz/ 87-2150MHz Ref.769220
- **Coaxdata 200Mbps**: Return Path Channel Simulator Ref.7637; Diplexer Filter 1-40MHz/ 47-2150MHz Ref.7654.
- Software Application CoaxManager™ for Windows XP/7/8.

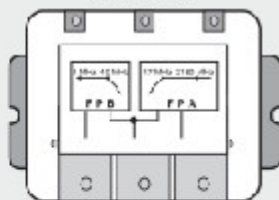
Collective Installation. Equipment necessary for measuring.

Coaxdata 200Mbps

Return Channel Simulator (5-30MHz)
Ref.7637



Diplexer Filter
1-40MHz/47-862MHz
Ref.7654



Field Meter
H60 Series

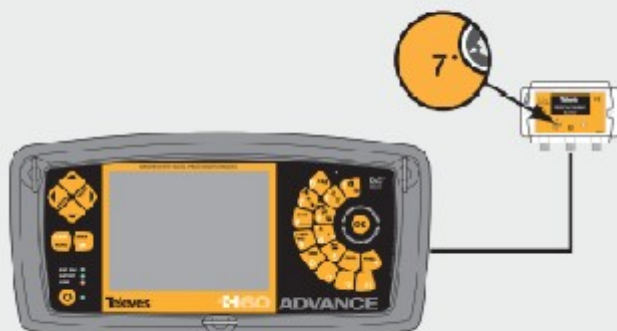
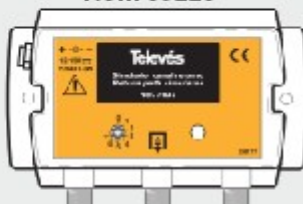


Coaxdata 1Gbps

Gaussian Noise
Meter Ref.5930



Diplexer Filter
1-70MHz / 88-2150MHz
Ref.769220



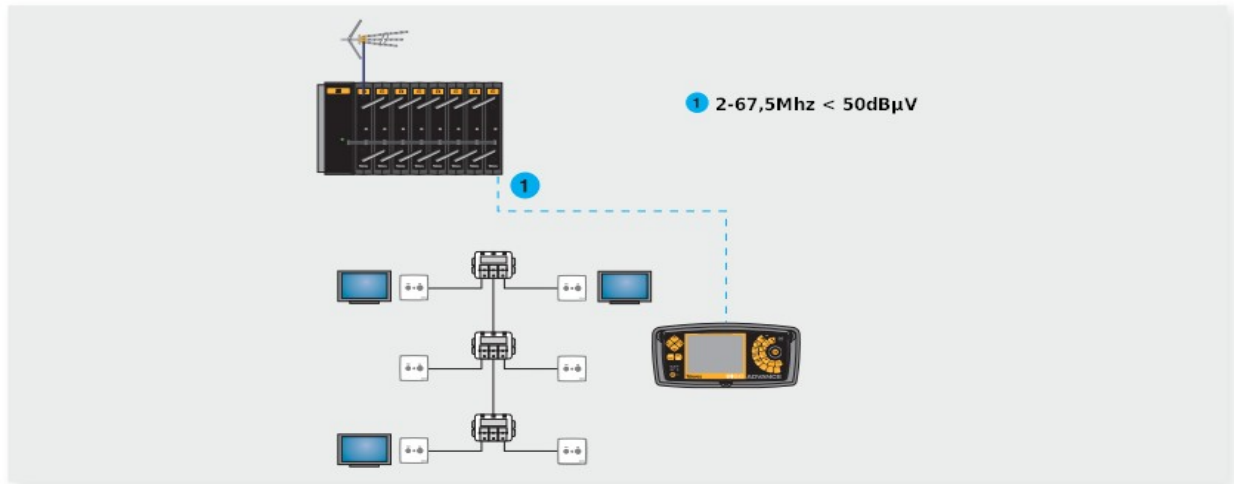
Record return channel simulator output, with field meter to keep it as a reference

It is important to record the output of the return channel simulator to have a reference value in order to calculate the attenuation in the coaxial outlets.

Certification Parameters

Noise from TV Headend

Disconnect the head of TV distribution network and proceed to connect Field Meter as shown in figure below. Through the meter to perform a measurement of the return channel being from 2 to 67.5 MHz in the output of the header devices.



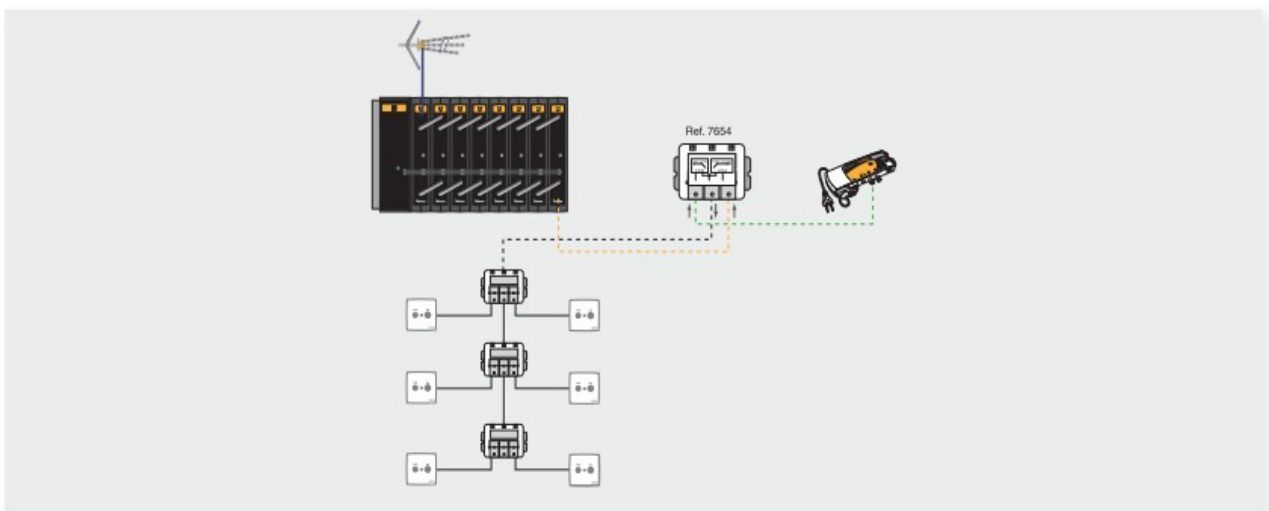
The maximum noise level in the measurement point should not exceed 50 dBuV in the return channel 2 to 67.5 MHz

Noise Causes:

- Noise from 2 to 67.5 MHz generated by the electronic devices present in the header.

Solutions:

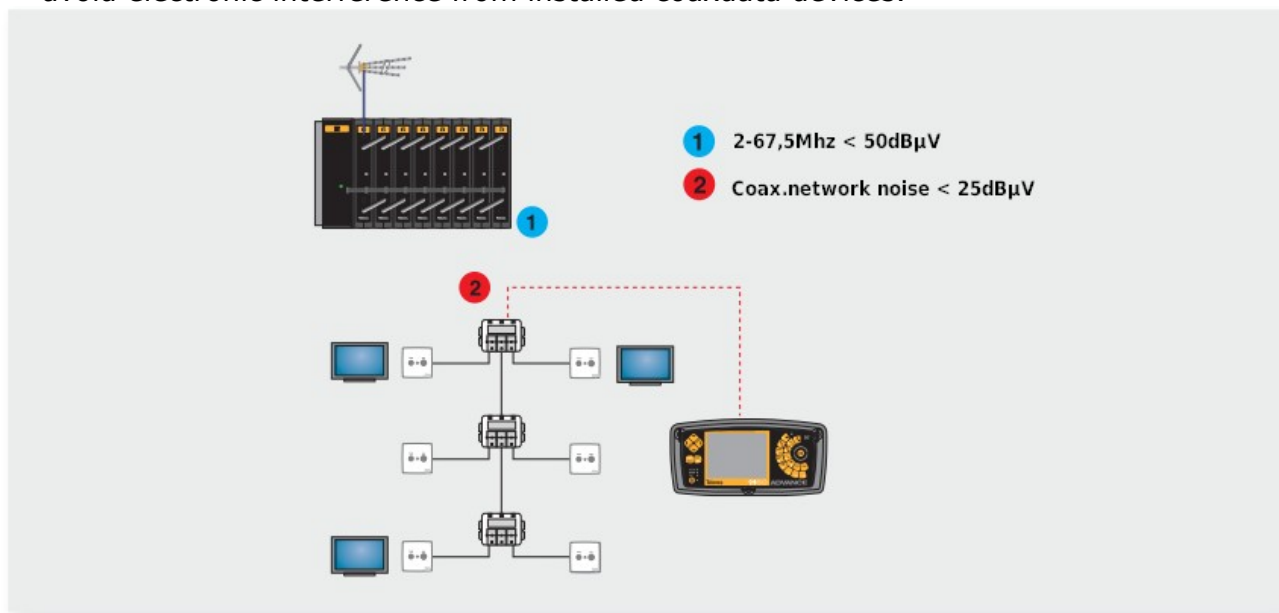
- Install diplexer filter Ref.7654 (CoaxData 200Mbps, 2-30Mhz) or Ref.769220 (CoaxData 1Gbps, 2 to 67.5 Mhz), so that the noise present in the return channel is filtered before mixing signal header with CoaxData system, passing only the frequencies of TV:



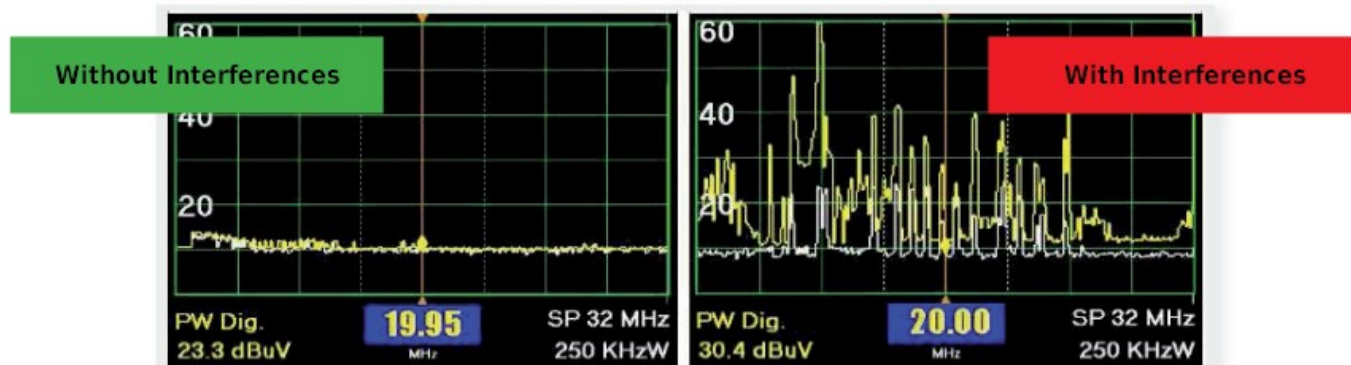
Noise form coaxial network

Use Field meter in order to measure return channel 2 to 67.5 MHz in the entrance of the TV distribution network, as illustrated in Figure.

- Note: Turn off all possible coaxdata modems on outlets were installed for measurement to avoid electronic interference from installed coaxdata devices.



The maximum level of interfering carriers at the point of measurement should not exceed 25 dBuV in the return channel 2 to 67.5 MHz



Noise Causes:

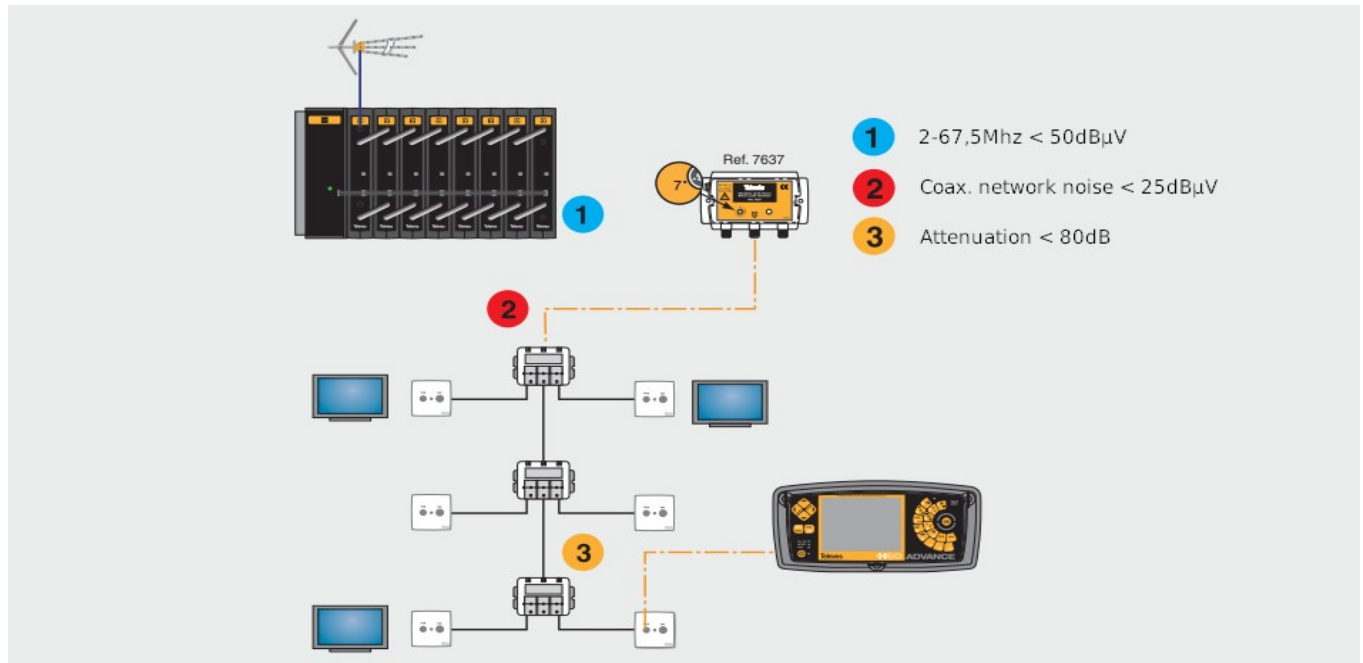
- Noise is generated from one of the outlets of the installation. Any device connected to the network that is generating noise in the return channel.
- Existence of a bad connection in the distribution network. The connections must be properly made live and ground. If the ground of one of the connections is not correct the coaxial antenna suffers an effect caused by the presence of interfering signals in the header.

Solutions:

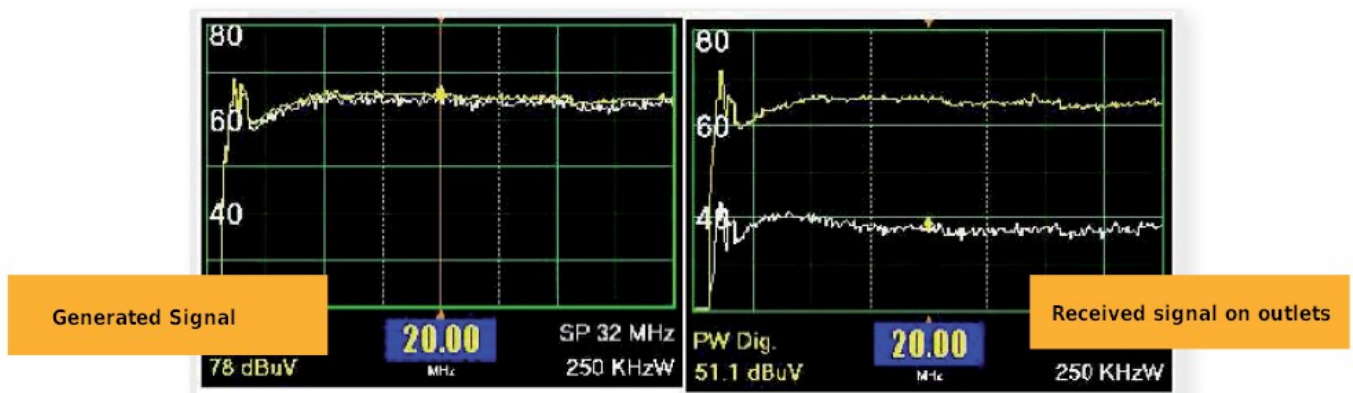
- Try to find out what the source of the noise in the distribution network. Once identified this source should be filtered to not interfere in the communication with the shots the rest of the installation.

Attenuation between headend and outlets

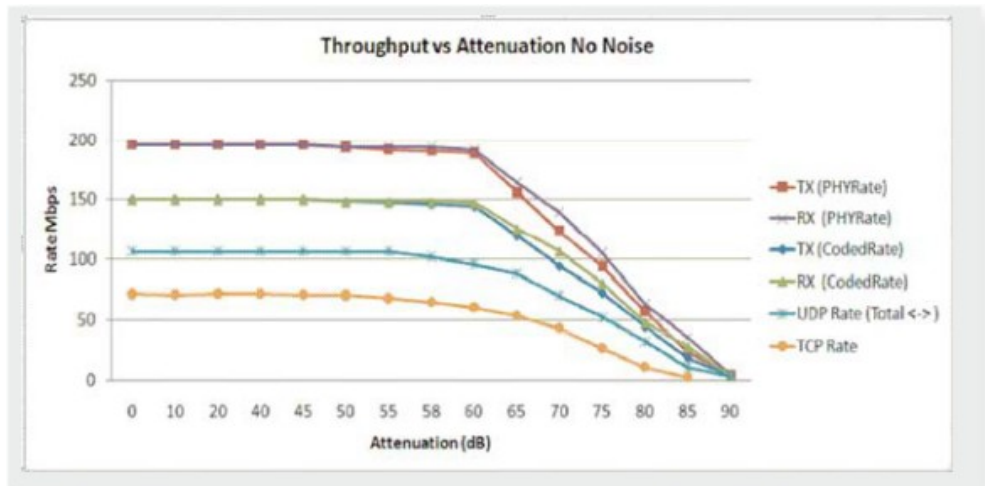
By 7637 Ref noise generator (Mode 7, Sweep Return Channel) in the entrance of the TV distribution network, as illustrated in the figure, and the field meter into the outlet, which should be measured is the loss of the signals generated. This tells us which is the measure of the attenuation between header and decision, and the channel transfer function between 2 to 67.5 MHz



The following example shows the response of a distribution network with about 25 dB of attenuation between header and socket and has a flat response.



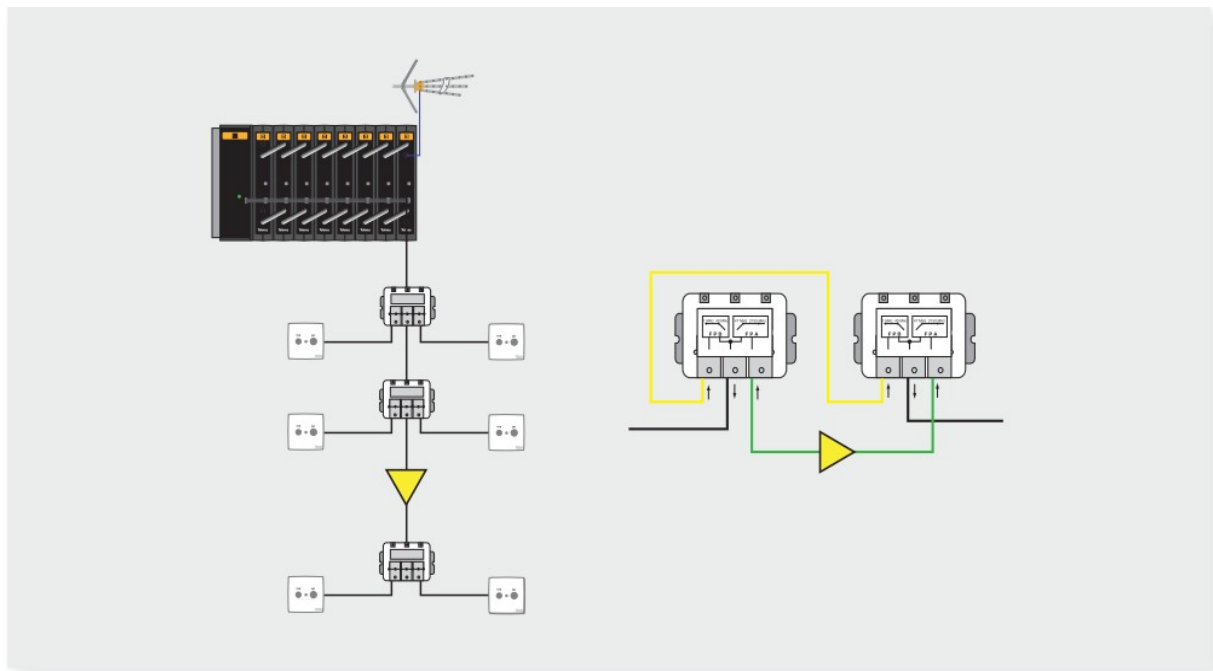
The behavior of the Ref 7689 (HomePlug AV) with attenuation is illustrated in the following figure, for a return channel with a background noise under 25 dBuV. As noise increases, the range of attenuation decreases.



- Figure shows the attenuation value compared to the rate available on the device. This measure may also be performed with the application software finally CoaxManager to comment further.

Causes

- Some elements used in the distribution network or coaxial outlet, don't support return channel path or has excessive attenuation.
- Some Line amplifiers in the coaxial network avoid transmission of the return signal to the sockets. Remember that if you have amplifiers in the backbone network, it is necessary to install a diplexer filter Ref.7654/Ref.769220 that allows the return channel or install into line amplifier if supports that feature.



- If no line amplifiers on coaxial and all elements support return channel path (2 to 67.5 MHz) then attenuation between header and outlets, is excessive beyond the limits of the system.

Solutions

- If the problem is excessive attenuation due to distribution network elements with excessive losses, replace with a more suitable element that supports the return channel with lower attenuation.
- If the attenuation of the distribution exceeds the system limit or system have intermediate amplifier elements, one solution is to allow the pass of the return channel via diplexer Ref.7654/Ref.769220 or turn on return path channel on the amplifier if it had this feature.

Line Amplifiers. Scenarios and Solutions.

Line amplifiers can have the functionality to support or not the pass of the return channel, and can do so actively or passively:

- **Passive return channel:** Enable passive return channel amplifier line, if you have this functionality. Thus, return channel is visible from master to end slave. It is important the attenuation of passive filter on amplifier is as low as possible.

1. Canal Retorno Pasivo, interno en el Amplificador

- Realizar Medidas.

- Comprobar mediante CoaxManager.

RF IN MATV < 100 dBμV

Si el amplificador tiene la capacidad de poner el Canal de Retorno pasivo, no habría nada que implementar en este sentido.

Manual de instrucciones 5335, 533501

- 1.- Entrada alimentación red (196-264V~ / 50-60 Hz)
- 2.- Conexión para toma de tierra
- 3.- LED de encendido
- 4.- Entrada FI + MATV. Salida canal de retorno
- 5.- Test entrada FI + MATV
- 6.- Test salida FI + MATV
- 7.- Salida FI + MATV. Entrada canal de retorno
- 8.- Atenuador señal MATV
- 9.- Ecualizador señal MATV
- 10.- Switch configuración amplificador canal principal
- 11.- Switch configuración amplificador canal principal
- 12.- LEDs de estado. Encendido indica presencia de señal.
- 13.- Switch configuración amplificador canal retorno
- 14.- Atenuador canal retorno
- 15.- Atenuador FI
- 16.- Switch configuración amplificador canal retorno
- 17.- Ecualizador FI
- 18.- Atenuador señal MATV
- 19.- Ecualizador señal MATV

Características técnicas	5335 / 533501			
	Principal MATV	Retorno		FI
		Activo	Pasivo	
Canales	47 - 862 (ref. 5335) 87 - 862 (ref. 533501)	5 - 30 (ref. 5335) 5 - 65 (ref. 533501)	950 - 2150	
Margen de frecuencia (MHz)				
Garantía (dB tip.)	40 - 53 (selec.)	20	-4	42
Tensión máxima de salida (DIN 45004B) (dBμV tip.)	124	115	-	121 ¹⁸⁾
Tensión máxima de salida (EN 50083/MD3) ¹⁹⁾ (dBμV tip.)	119	113	-	115
Tensión máxima de salida (IMD2) ¹⁹⁾ (dBμV tip.)	114	92	-	115
Tensión máxima de salida CTB, CSO, XMOO ¹⁹⁾ (dBμV tip.)	106	-	-	-
Figura de ruido (dB tip.)	10	10	-	13
Pérdidas de retorno (dB tip.)	10	10	10	6
Margen de atenuación (dB tip.)	0 - 18	-	-	0 - 12
Margen de ecualización (dB tip.)	0 - 10	0 - 20	-	0 - 18
Margen de regulación (dB tip.)	0 - 10	-	-	-
Margen de preacentuación (dB tip.)	0 - 10	-	-	-

- **No return channel or active return channel:** If the line amplifier does not have return channel functionality, you need diplexing with Ref.7654/Ref.769220, so you can bypass the amplifier and enable return channel, as illustrated in the following Figure. If you have an active amplifier, you also need diplexer because amplification is unidirectional and don't allow return channel pass from master to slaves. Remember, communication is bidirectional between master and slaves.

2. By-Pass pasivo con Filtros Diplexores Ref. 7654

- Realizar Medidas.

- Comprobar mediante CoaxManager.

- Aislamiento Entrada/Salida del Amplificador.

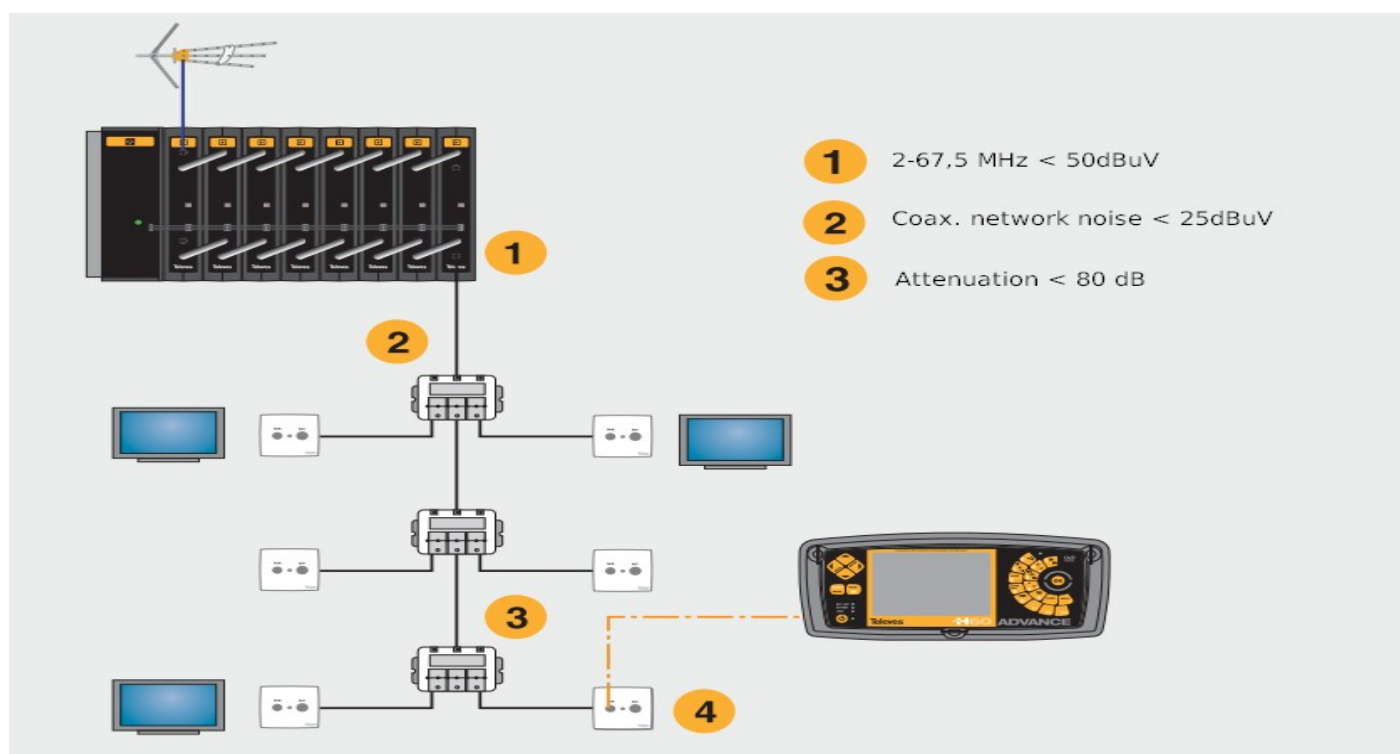
RF IN MATV
< 100 dBμV

Con esta solución, se mantiene la estructura Maestro-Eslavos y la posible gestión remota.

Eslavo final, perteneciente al maestro de Cabecera.

Signal noise on outlets

By field meter, measure the noise level in the return channel (2 to 67.5 MHz) at the outlet where you are installing the CoaxData.





Possible causes of noise:

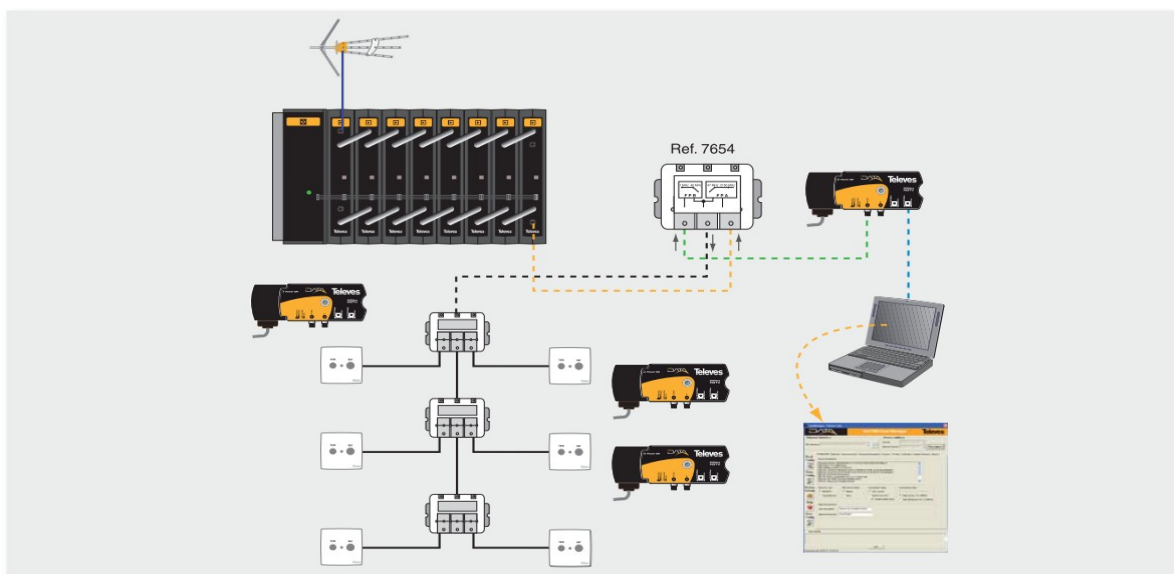
- Noise from the header (not met point 1)
- Noise from other outlet (not met point 2).
- Bad connection on conductor and/or mesh of coaxial cable, on any distribution element or outlet.

Solutions:

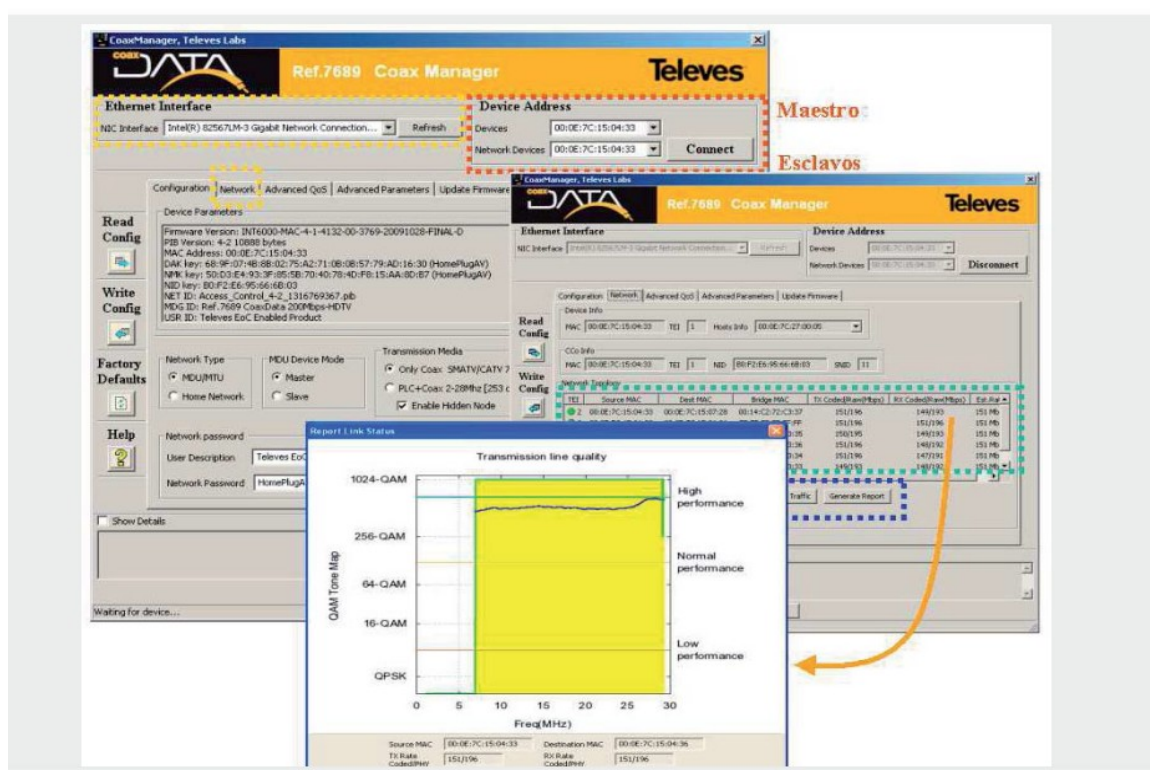
- Identify source of the noise that appears in the field meter.
- Make sure all connections are well made installation.

Software Tool: CoaxManager™

By CoaxManager™ you have the possibility of generating a collective Installation Report, its a software certification of CoaxData behavior in existing return channel. To do this it is necessary to have a PC with CoaxManager installed the latest version and connect to the Master (in the final phase of the installation once you have passed the above points), and run it.



After running CoaxManager you need select Master dipositive to connect and select network tab. Tool shows existing links with channel estimated. You must select generate traffic button and generate report in PDF.



Steps shown in the following figure:

Device Info

MAC: 00:0E:7C:15:04:33 TEI: 1 Hosts Info: 00:0E:7C:28:00:01 Ethernet Link: On

CCo Info

MAC: 00:0E:7C:15:04:33 TEI: 1 NID: B0:F2:E6:95:66:6B:03 SNID: 7

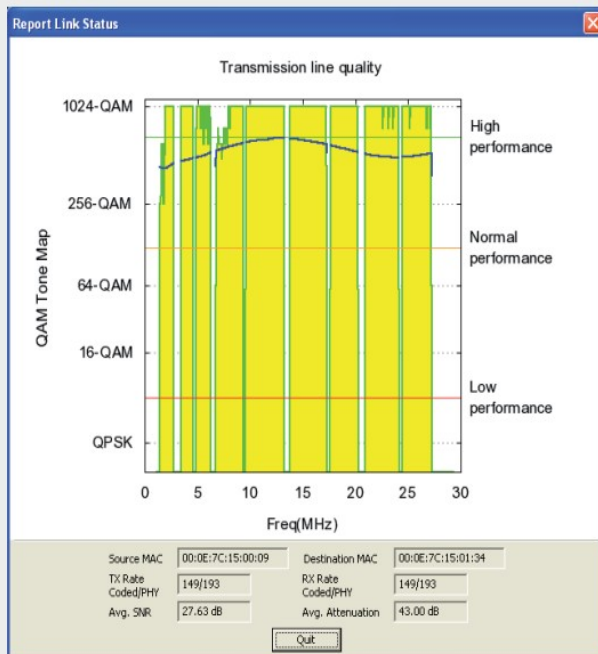
Host Info: Shows users connect to device by Ethernet interface

Network Topology

TEI	Source MAC	Dest MAC	Bridge MAC	TXCoded/Raw(Mbps)	RXCoded/Raw(Mbps)
2	00:0E:7C:15:04:33	00:0E:7C:15:05:8F	FF:FF:FF:FF:FF:FF	0/0	0/0
3	00:0E:7C:15:04:33	00:0E:7C:15:0A:86	FF:FF:FF:FF:FF:FF	0/0	0/0
4	00:0E:7C:15:04:33	00:0E:7C:15:07:27	FF:FF:FF:FF:FF:FF	0/0	0/0
5	00:0E:7C:15:04:33	00:0E:7C:15:03:D5	FF:FF:FF:FF:FF:FF	0/0	0/0
6	00:0E:7C:15:04:33	00:0E:7C:15:07:22	FF:FF:FF:FF:FF:FF	0/0	0/0
7	00:0E:7C:15:04:33	00:0E:7C:15:04:3E	FF:FF:FF:FF:FF:FF	n/n	n/n

Permite verificar el estado de los enlaces.

- Link operates at maximum rate
- Link operates at medium rate
- Link operates at low poor rate



CoaxManager, Televes Labs

Ref.7689 Coax Manager

Ethernet Interface

NIC Interface: Intel(R) I218GM Gigabit Network Connection

Device Address

Devices: 00:0E:7C:15:04:33

Network Devices: 00:0E:7C:15:04:33

Disconnect

Read Config

Device Info

MAC: 00:0E:7C:15:04:33 TEI: 1 Hosts Info: 00:0E:7C:28:00:01 Ethernet Link: On

Write Config

MAC: 00:0E:7C:15:04:33 TEI: 1 NID: B0:F2:E6:95:66:6B:03 SNID: 7

Network Topology

TEI	Source MAC	Dest MAC	Bridge MAC	TXCoded/Raw(Mbps)	RXCoded/Raw(Mbps)	Est.R.
2	00:0E:7C:15:04:33	00:0E:7C:15:05:8F	FF:FF:FF:FF:FF:FF	0/0	0/0	100
3	00:0E:7C:15:04:33	00:0E:7C:15:0A:86	FF:FF:FF:FF:FF:FF	0/0	0/0	100
4	00:0E:7C:15:04:33	00:0E:7C:15:07:27	FF:FF:FF:FF:FF:FF	0/0	0/0	100
5	00:0E:7C:15:04:33	00:0E:7C:15:03:D5	FF:FF:FF:FF:FF:FF	0/0	0/0	100
6	00:0E:7C:15:04:33	00:0E:7C:15:07:22	FF:FF:FF:FF:FF:FF	0/0	0/0	100
7	00:0E:7C:15:04:33	00:0E:7C:15:04:3E	FF:FF:FF:FF:FF:FF	n/n	n/n	n/n

Check Devices Generate Traffic Make Report

Show Details

Connected with 00:0E:7C:15:04:33

Quit

00:0E:7C:15:04:33.pdf - Foxit Reader : [00:0E:7C:15:04:33.pdf]

CoaxDATA Certification Report

Televes Labs, I+D.

Report Data

This report have been generated by automated by CoaxDATA Applications and contains info about CoaxDATA Network

SW Build Version: 3.06 (Build n°52, Build Date: Fri Dec 9 10:46:47 UTC 2011)

If you need assistance send this report mail@coaxdata.com. Please attach project details like project location, description of installation and any relevant parameters

Report Generate on: Tue Dec 13 14:37:15 2011

List of Devices reported:

Device 00:0E:7C:15:04:33: PII Parameters Device Info

Device 00:0E:7C:15:07:27: PII Parameters Device Info

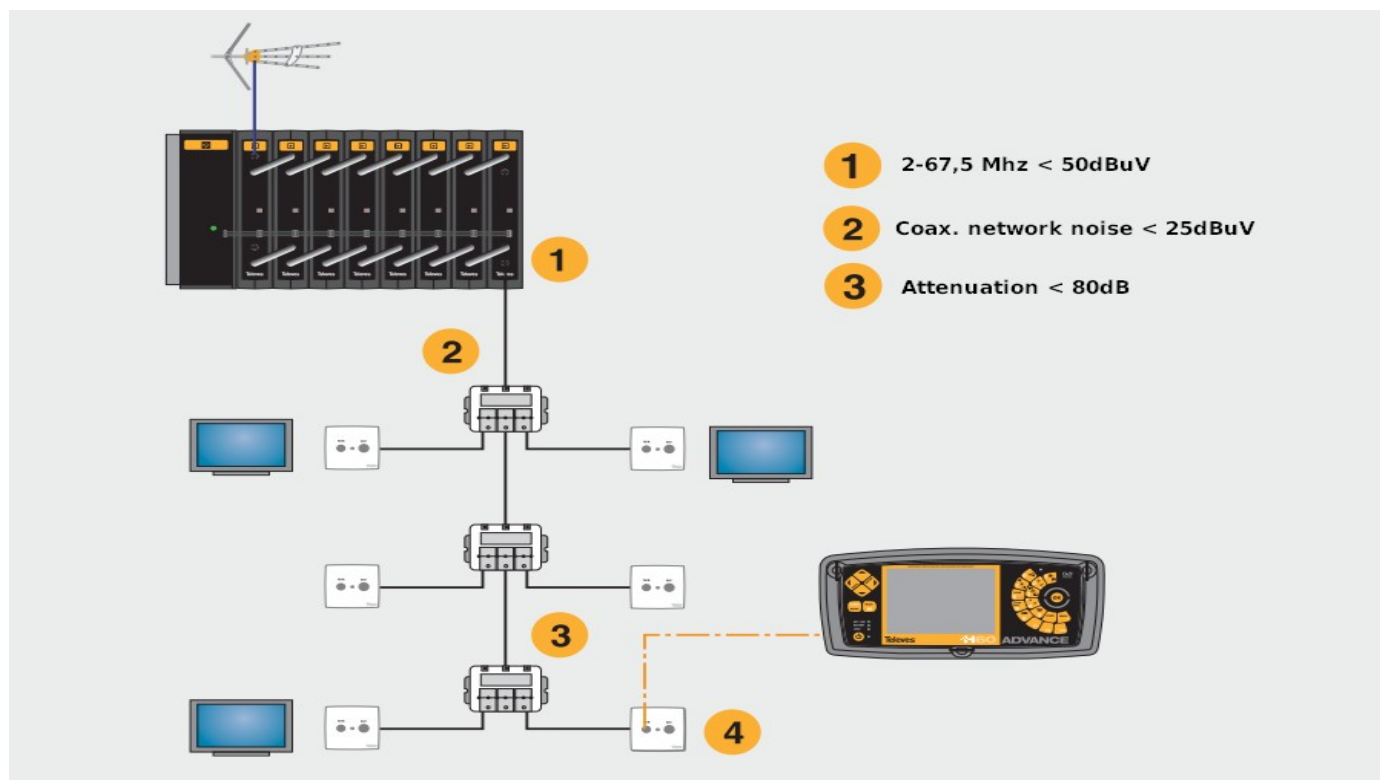
Ready 1 (1/25) 98.92% Size: [8.65 * 11.42 m]

Clicking on existing links you can have a more parameters like channel coding, attenuation and SNR of links between Master and slaves.

- Note: Any doubt CoaxManager Management Software, refer to the User Manual.

Certification Table

In order to clarify all steps and measures to be implemented, we propose the following measurement chart following the scheme proposed



Measurement Description	Measurement Point	Frecuencies Range	Minimum-Maximum Values	Measured Value
Check output level of Path Channel Simulator Ref.5930/Ref.7637.	--	2-30 Mhz/ 2-67,5 Mhz	90dBuV	
1. Noise from headend.	1	2-30 Mhz/ 2-67,5Mhz	50dBuV	
2. Noise from coaxial network.	2	2-30 Mhz/ 2-67,5Mhz	25dBuV	
3. Attenuation between headend and outlets. (with return path Simulator, choose the worst cases).	3	2-30 Mhz/ 2-67,5Mhz	85dB	
4. Noise floor on Outlet.	4	2-30 Mhz/ 2-67,5Mhz	0-25dBuV	

Certification Report Example

The following is an example of the report generated by both the CoaxManager as AccessControl. It is a pdf file that must accompany all completed installation for your records.

CoaxDATA Certification Report

Televes Labs, I+D.

Report Data

This report have been generated by automated by CoaxManager Application and contains info about CoaxDATA Network.

If you need assistance send this report info@televes.com. Please attach project details like project location, description of installation and any relevant parameters

Report Generate on: Mon Sep 26 12:16:45 2011

List of Devices reported:

Device 00:0E:7C:15:04:33: [Firmware Parameters](#) [Device Info](#)

Device 00:0E:7C:15:07:28: [Firmware Parameters](#) [Device Info](#)

Device 00:0E:7C:15:02:84: [Firmware Parameters](#) [Device Info](#)

Device 00:0E:7C:15:07:2A: [Firmware Parameters](#) [Device Info](#)

Device 00:0E:7C:15:04:2F: [Firmware Parameters](#) [Device Info](#)

Device 00:0E:7C:15:07:2D: [Firmware Parameters](#) [Device Info](#)

Device 00:0E:7C:15:04:36: [Firmware Parameters](#) [Device Info](#)

CoaxDATA Certification Report

1

Device 00:0E:7C:15:04:33

Firmware Parameters

00:0E:7C:15:04:33 Firmware Parameters	
MAC Address	00:0E:7C:15:04:33
Network ID	Accron_Control_4-2_1316769367.plb
Manufacturer ID	Ref 7689 CoaxData 200Mbps-HDTV
User ID	Televes EoC Enabled Product
Firmware Version	INT6000-MAC-4-1-4133-00-3769-20091028-FINAL-D
Firmware Mode	MDU Master
Transmission Media	Only Coax 7.5-30MHz
Hidden Node	Enabled
AVLN NMK Key	50 D5 E4 93 7F 85 5B 70 40 78 4D F8 15 AA 8D B7

Packet Counters and Ethernet State

00:0E:7C:15:04:33 State&Counters	
MPDU Transmit Packets	1528708
MPDU Transmit Error Rate	0.00%
MPDU Receive Packets	981805
MPDU Receive Error Rate	0.00%
Ethernet Link Status	On (Speed=100Mbps,Duplex=Full)

Device Hosts

00:0E:7C:15:04:33 Ethernet Hosts	
Hosts	
Device 00:0E:7C:15:04:33	2

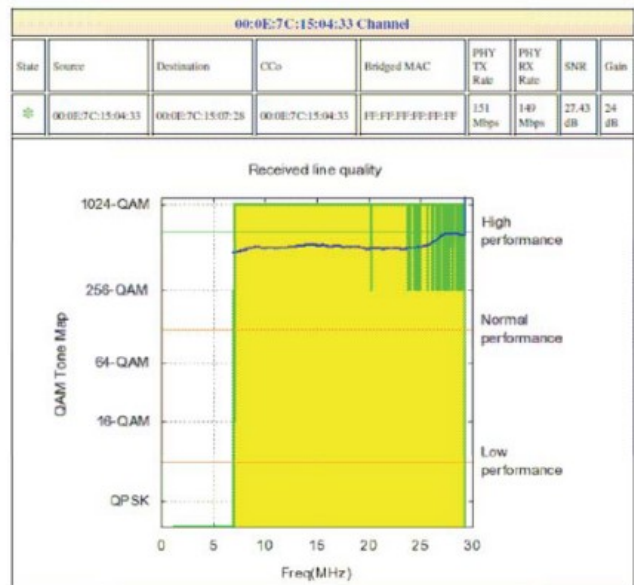
MAC Addresses:

00:15:00:3D:63:BD 00:0C:29:B3:85:F9 00:13:21:C1:EA:DB 00:0F:FE:76:DE:58 2C:27:D7:1D:E4:20 00:25:64:AC:A7:78
00:19:21:68:99:CF 00:24:81:22:14:50 00:00:AA:81:AD:AE 78:AC:C9:BE:4C:7F 00:0F:FE:91:06:F8 00:0F:FE:76:DE:00
00:0C:29:62:C8:F1 00:23:7D:80:3C:43 00:1F:29:88:D5:74 9C:8E:99:3D:46:AB 00:1A:4E:13:BB:A2 00:23:24:17:1E:E3
00:10:40:C1:0D:3B 00:50:04:49:0E:C6 00:0C:29:56:89:54 00:0F:FE:89:87:24 00:0C:12:00:FC:62 00:3C:48:23:5A:8F
52:54:00:58:C2:27 00:24:21:01:55:00:0C:29:45:2E:AE 00:24:81:22:14:86 00:0F:FE:74:4C:C3 00:0A:B8:D9:ED:80
00:15:70:3D:B3:CB 00:D0:24:01:B0:CB 00:0E:8C:BA:63:CF 00:16:E6:55:3B:96 00:0F:FE:89:7C:54 00:0F:FE:89:7D:B4
00:16:E6:62:46:96 00:01:F4:CB:9D:D8 00:20:4A:81:20:80 00:1B:53:58:91:D0 00:00:0C:07:AC:96 00:0C:29:16:3D:1E
00:0F:FE:19:7E:62 00:0F:FE:9D:00:2A 00:90:FB:52:14:CF 00:0F:FE:89:7D:AE 00:0E:0C:72:8C:A5 00:1E:C9:DA:65:DE
F4:CE:46:15:D1:B8 00:21:85:D0:76:2F 00:14:85:CB:C8:D7 00:0F:FE:89:7D:E6 00:0D:61:3A:6D:74 00:06:93:42:33:F8
00:0C:29:CF:6F:0B 00:1C:06:00:86:DC 00:23:F8:C2:11:5A 00:0D:61:C1:89:2A 00:50:DA:C3:DB:61 00:0F:FE:74:4B:5B
00:15:70:3D:B3:D3 00:00:0C:07:AC:64 70:5A:B6:91:46:AA 00:0F:FE:89:74:78

Device Hosts

3

Device Channel



Device Channel

4

European technology **Made in**  **EU**rope