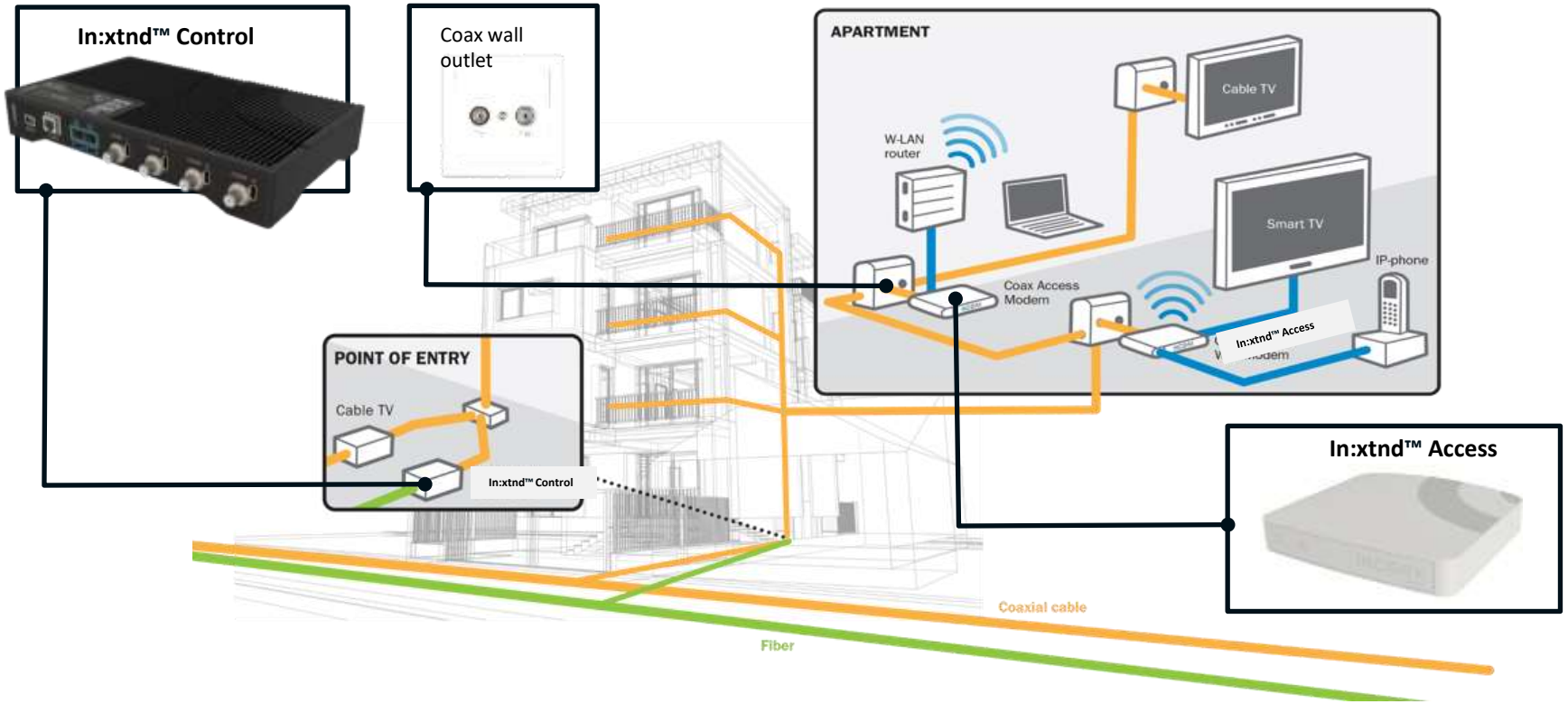
The Fiber Extension Company
Fiber-to-the-coax (FTTC)
PROFiber
2018-09-03

The solution: fiber extension over coax

- Coaxial cabling is capable of up to 100 Gbps throughput.
- Coax is available in most homes, apartments, commercial buildings and hotels.
- New InCoax product family based on MoCA Access™ 2.5 offers:
  - Symmetrical gigabit speeds with high QoS.
  - Use of existing in-building coax as fiber extension for FTTB.
  - Easy installation. Simply plug in the modem in the apartment once the control unit has been installed in the basement.

Intruducing: in:xtnd™



MoCA Access 2.5™

- Transparent IEEE802.3 bridge
- MAC speed up to 2.5Gbps (DL:2.5/UL:2.0)
- Configurable DL/UL ratio
- Profiles for 1.0 /1.5/2.0 or 2.5Gbps MAC rates
- MAC using time division multiple access (TDMA)
- Supports up to 512 multicast addresses and full VLAN range
- Shaping and QoS up to eight classes
- Low latency
- Max MTU size 2k
- Client node with three power states
- Frequency range 400-1675MHz
- Profile C 225MHz/profile D 300,400 or 500MHz bands with channel bonding
- P2PM up to 63 modems
- PHY using time division duplexing (TDD) and OFDM modulation
- Up to 1024QAM
- Packet error rates < 10^{-6} or 10^{-8}
- Supports multicast over a coax link
- 5 pre-defined bands for AL-IP or co-exist TV services
- AES cryptographic algorithm with 128-bits key with AATEK refreshment within six hours
- Three power contours with 45dB, 55dB or 65 dB link budget

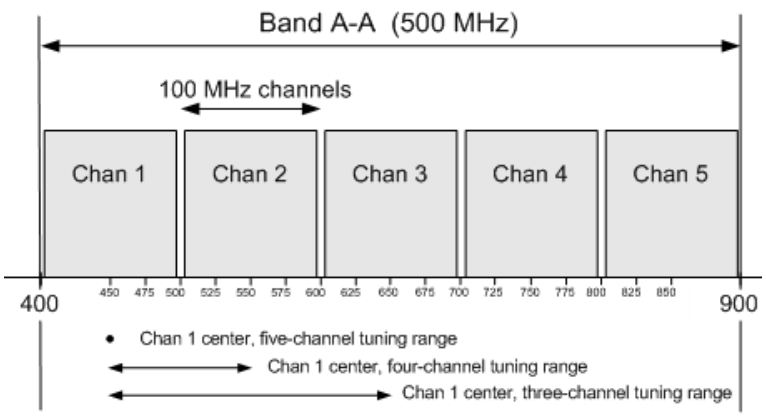
In:xtnd™ I Control I MA 2.5 4

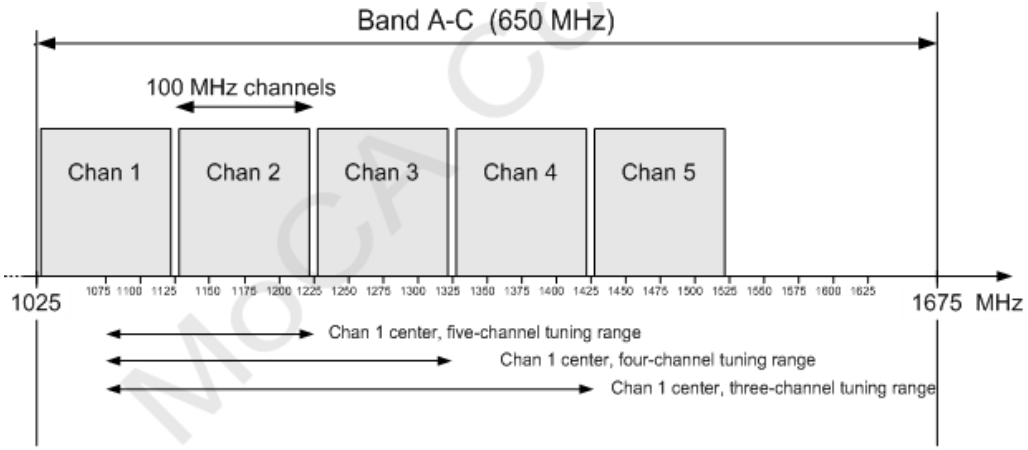
In:xtnd™ I Control I MA 2.5 4 is a broadband over coax access node, capable of 2.5 Gbps per RF-port, a total of 10 Gbps. In:xtnd™ CONTROL communicates with In:xtnd™ ACCESS. Products using MoCA Access™ 2.5 standard. The In:xtnd™ Control 4 ports supports up to 124 In:xtnd Access™ modems.

In:xtnd™ I Access I MA 2.5 2 Ethernet

In:xtnd™ I Access I MA 2.5 2 Ethernet is a cost-efficient Coax to Ethernet Media Converter – 2x1 Gbps. In:xtnd™ Access 2 Ethernet communicates with In:xtnd™ CONTROL 4 port. Products using MoCA Access™ 2.5 standard.

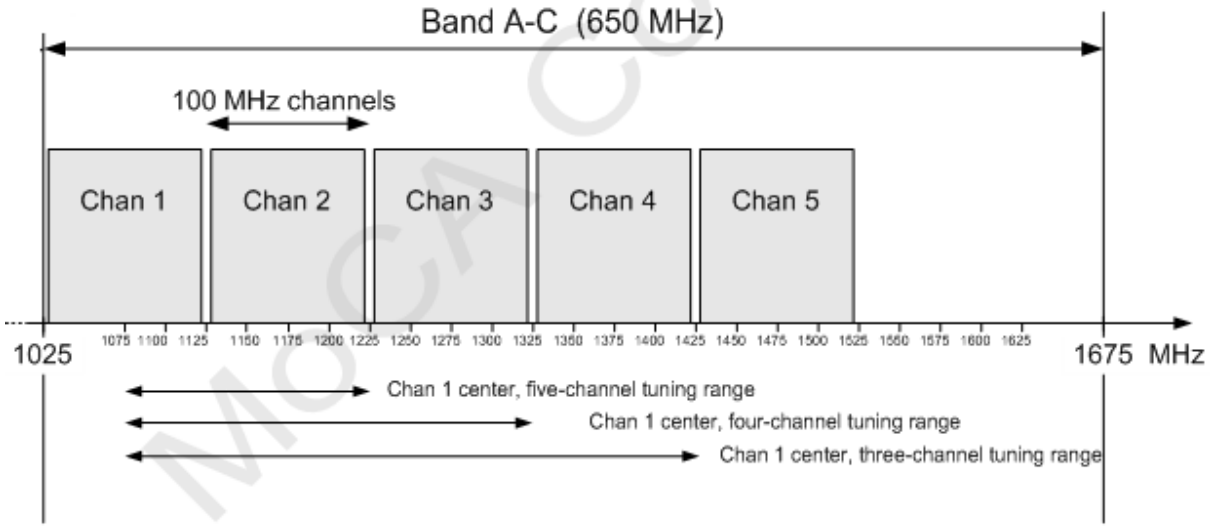
Coax Use Case 1: All-IP using full Spectrum





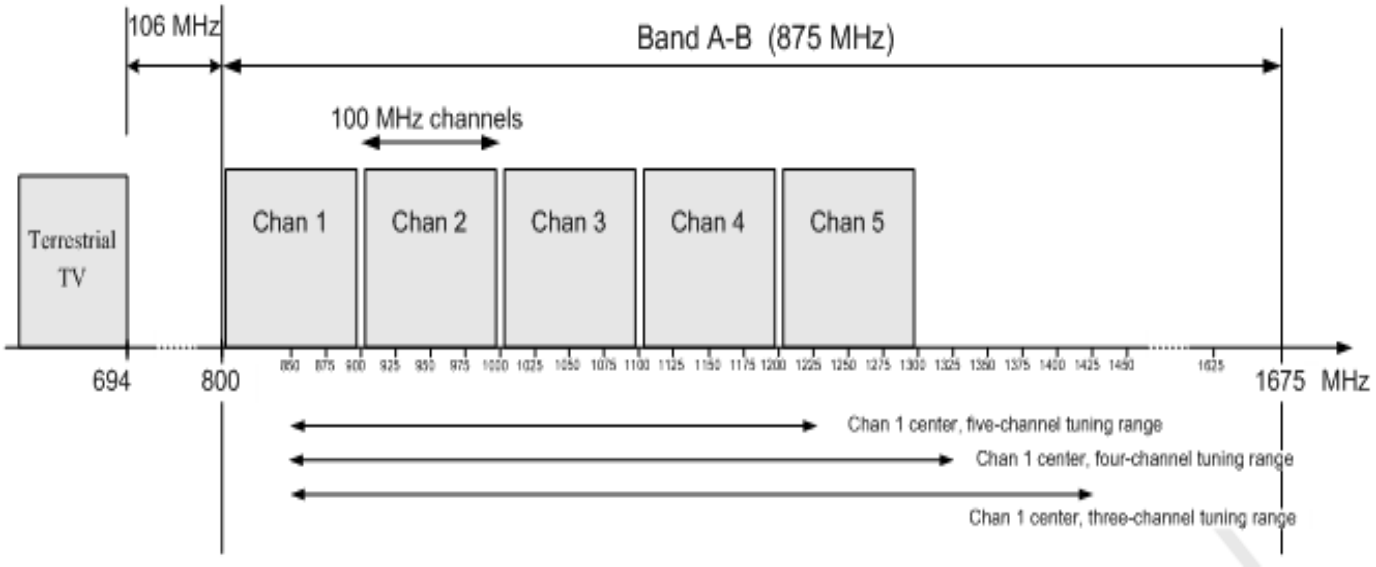
- Using 400-900 and 1025-1675 MHz spectrum
- Providing 2 x 2.5 Gbps over each coax loop
- Max number of 126 modems on each coax loop

Coax Use Case 2: Co-existence with terrestrial TV



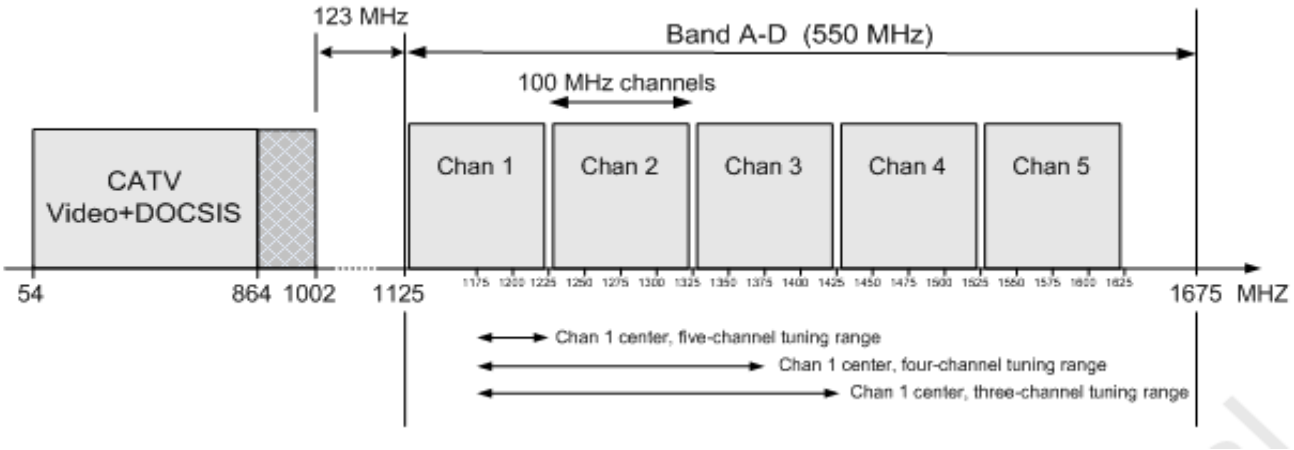
- From now to 2020
- Using 1000-1675 MHz spectrum
- Providing 2.5 Gbps over each coax loop
- Max number of modems: 63 on each coax loop

Coax Use Case 3: Co-existence with terrestrial TV



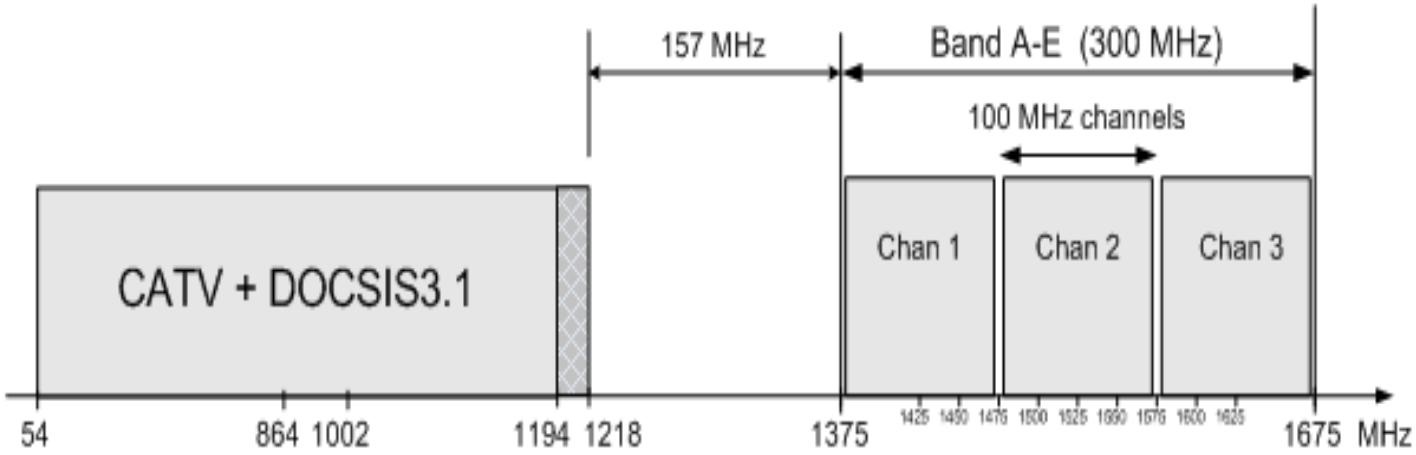
- After 2020 (or now?)
- Using 800-1675 MHz spectrum
- Providing 2.5 Gbps over each coax loop
- Max number of modems: 63 on each coax loop

Coax Use Case 4: Co-existence with DOCSIS 3.0



- Using 1125-1675 MHz spectrum
- Providing 2.5 Gbps over each coax loop
- Max number of modems: 63 on each coax loop

Coax Use Case 5: Co-existence With DOCSIS 3.1



- Using 1375-1675 MHz spectrum
- Provides 1.5 Gbps over each coax loop
- Max number of modems: 63 on each coax loop

Access technologies/standards over coax

	G.fast 106 MHz	G.fast 212 MHz	ITU-T G.hn	MoCA Access 2.5	DOCSIS 3.0	DOCSIS 3.1
Maximum aggregated MAC data rate	900 Mbps	1800 Mbps	1700 Mbps	2500 Mbps	1216 Mbps	7298 Mbps
Typical download MAC data rate	Up to 100 Mbps – 400 meter	Up to 300 Mbps – 300 meter	1000 Mbps – 400 meter	1000 Mbps – 240 meter	500 Mbps – 300 meters	1000 Mbps – 300 meter
Typical upload MAC data rate	Up to 50 Mbps – 400 meter	Up to 100 Mbps – 100 meter	700 Mbps – 400 meter	1000 Mbps – 240 meter	100 Mbps – 300 meters	200 Mbps – 300 meter
Modulation Scheme	DMT	DMT	OFDM 4096 QAM	OFDM 1024 QAM	256 QAM	OFDM 4096 QAM*
Roundtrip Latency	<20ms	<20ms	<5ms	<6ms	<6ms	<6ms
TDD or FDD	TDD	TDD	TDD	TDD	FDD	FDD
Channel size	106 MHz	212 MHz	200 MHZ	5 x 100 MHz channels	192 channels	768**
Channel location	0-17,644 MHz	0-35,3 MHz	0-200 MHz	400-1675 MHz	54-1002 MHz	54-1218 MHz***
Vectoring required/used? (Y/N)	Y	Y	Y	N	N	N
Supports how many clients?	1	1	Up to 250	63	Load dependent	Load dependent
Point to Multi Point (Y/N)	N	N	N	Y	Y	Y
QoS levels supported	No QoS	No QoS	8	8	5	5
Security / Privacy	No encryption	No encryption	AES 128bit key	AES 128bit key	AES 128bit key	AES 128bit key