

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Evolution Broadband, LLC's Request for Waiver of Section 76.1204(a)(1) of the Commission's Rules	)	CSR-7902-Z
	)	
Implementation of Section 304 of the Telecommunications Act of 1996 Commercial Availability of Navigation Devices	)	CS Docket No. 97-80
	)	

**OPPOSITION TO PETITION FOR RECONSIDERATION**

**I. Introduction**

Evolution Broadband, LLC ("Evolution"), a small equipment vendor and recipient of a waiver<sup>1</sup> of the Integration Ban for low-cost, limited-capability set-top boxes, files this *Opposition to the Petition for Reconsideration*<sup>2</sup> filed by Public Knowledge and others.<sup>3</sup> The Commission should reject the *Petition for Reconsideration* for the following reasons:

- The Commission correctly concluded that the waiver for Evolution's low-cost, limited-capability set-top boxes would not undermine CableCARD support or other common reliance technologies.

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<sup>1</sup> *Evolution Broadband, LLC's Request for Waiver of Section 76.1204(a)(1) of the Commission's Rules; Implementation of Section 304 of the Telecommunications Act of 1996; Commercial Availability of Navigation Devices*, Memorandum Opinion and Order, CS Docket 97-80, FCC 09-46 (rel. June 1, 2009) ("*Evolution Order*").

<sup>2</sup> *In the Matter of Evolution Broadband, LLC's Request for Waiver of Section 76.1204(a)(1) of the Commission's Rules, Implementation of Section 304 of the Telecommunications Act of 1996 Commercial Availability of Navigation Devices*, CSR-7902-Z, CS Docket No. 97-80 (filed Jun. 29, 2009) ("*Petition for Reconsideration*").

<sup>3</sup> Public Knowledge, Free Press, Media Access Project, New America Foundation, Open Technology Institute, and U.S. PIRG (collectively, "Petitioners").

- The Commission articulated ample factual, legal, and policy justifications for granting Evolution's waiver petition.
- The Commission properly interpreted precedent, concluding that past orders adopted a low-cost, limited-capability standard for set-top box waivers.
- The Evolution set-top boxes at issue will always be one-way devices incapable of being upgraded to provide any kind of advanced functionality.

In short, Petitioners' arguments for overturning the *Evolution Order* lack any basis in fact, law, or policy, and must be rejected.

## II. *Petition for Reconsideration*

### A. **The Commission correctly concluded that the waiver for Evolution's low-cost, limited-capability set-top boxes would not undermine CableCARD support or other common reliance technologies.**

Petitioners argue that the filing of waiver applications by four set-top box manufacturers after the release of the *Evolution Order* constitutes a "flood of applications," and somehow establishes that the Commission committed reversible error.<sup>4</sup> Petitioners erroneously conclude that the Commission significantly underestimated the impact of the *Evolution Order* on CableCARD support and the development of other common reliance technologies.<sup>5</sup> Contrary to Petitioners' claims, the *Evolution Order* promotes CableCARD support and the development of other common reliance technologies.

**CableCARD Support.** The *Evolution Order* does not undermine CableCARD support. As the Commission noted in the *Evolution Order*, cable operators remain obligated to offer and support CableCARDS for the vast majority of set-top boxes, as

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<sup>4</sup> *Petition for Reconsideration* at 4.

<sup>5</sup> *Id.*

well as to make CableCARDs available for use in digital-ready devices that are purchased in the retail market.<sup>6</sup> Nothing in the *Evolution Order* changes that.

Evolution fully endorses CableCARD technology, and, in anticipation of increased consumer demand for CableCARD-compliant set-top boxes, Evolution plans to bring higher-end CableCARD-compatible set-top boxes to the marketplace. To that end, Evolution is currently working with CableLabs to certify a CableCARD based on Conax Conditional Access security, which Evolution uses in its set-top boxes.<sup>7</sup>

As the Commission noted, Evolution's set-top boxes accelerate cable systems' transition to all-digital, promote the development and deployment of advanced services and technologies, and encourage consumer demand for CableCARD-compliant set-top boxes. Petitioners offer no evidence rebutting the Commission's well-reasoned analysis and conclusions.

**Development of other "common reliance" technologies.** Petitioners' then present a parade of horrors as to how the *Evolution Order* will destroy the "development of other common reliance technologies."<sup>8</sup> Their claimed fears provide no basis for the reconsideration of the Commission's conclusions.

As noted above, the Evolution set-top boxes are equipped with Conax Conditional Access ("Conax") security. Conax is an open standard conditional access technology currently licensed to over 200 set-top box manufacturing companies, including a number of prominent Consumer Electronics Association members (e.g.,

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<sup>6</sup> *Evolution Order*, ¶12.

<sup>7</sup> In its capacity as the exclusive distributor of Conax Technology in the United States, Evolution is assisting Conax in acquiring CableLabs certification for a CableCARD based on Conax Conditional Access security. This card works in any CableLabs certified advanced two-way set-top box or retail "Digital Cable Ready" device.

<sup>8</sup> *Petition for Reconsideration* at 4.

Samsung Electronics Co. Ltd., Motorola Ltd.). Currently deployed in over 300 systems worldwide, the use of Conax provides system operators with the flexibility to choose from hundreds of set-top box manufacturers.<sup>9</sup>

Conax is also fully compliant with DVB SimulCrypt, a non-proprietary, open standard platform, which allows the co-existence of different security and conditional access systems on one cable system.<sup>10</sup> This allows cable operators to purchase, deploy and use set-top boxes from multiple vendors within a single cable system. To date, Conax has been deployed with over 20 system operators running multiple conditional access systems on the same network.<sup>11</sup>

With over 200 set-top box manufacturers licensing Conax, SimulCrypt is the perfect solution for opening the marketplace to multiple set-top box suppliers and increasing competition. As Cisco/Scientific Atlanta's Chief Scientist Tony Wasilewski has written, "operators can derive more leverage by introducing a second [conditional access system] to their networks, thus spurring competition not only for receiving devices but also for the separable security modules themselves."<sup>12</sup> In order to achieve this, Mr. Wasilewski wrote, "a method is needed to allow CableCARDs...from different [conditional access systems] to work in harmony on the same content streams...[and] Simulcrypt provides an answer in this area."<sup>13</sup>

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<sup>9</sup> See *Exhibit 1* (Letter from Geir Bjørndal, EVP Sales and Marketing, Conax AS, to Federal Communications Commission (Jul. 9, 2008)).

<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

<sup>12</sup> Tony Wasilewski, *Simulcrypt: May They Live Happily Ever After*, May 29, 2008, available at [http://blogs.cisco.com/sp/comments/simulcrypt\\_may\\_they\\_live\\_happily\\_ever\\_after/](http://blogs.cisco.com/sp/comments/simulcrypt_may_they_live_happily_ever_after/) (last visited Jul. 8, 2009).

<sup>13</sup> *Id.*

The Evolution set-top boxes at issue are distinctly different from the waiver applications filed by other manufacturers seeking similar waivers.<sup>14</sup> Based on Evolution's information and belief, these manufacturers employ a security technology based on a rudimentary "privacy mode" version of the Motorola and Cisco proprietary conditional access systems.<sup>15</sup> Evolution's use of the Conax open standard, non-proprietary conditional access technology in their set-top boxes – and its compliance with SimulCrypt – not only furthers the development of common reliance technologies, but it also increases competition in the navigation device marketplace. Petitioners' claim that the *Evolution Order* will somehow undermine the development of other common reliance technologies lacks any basis in fact, and provides no grounds for a reversal of the Commission's conclusions.

**B. The Commission articulated ample factual, legal, and policy justifications for granting Evolution's waiver petition.**

Petitioners' claim that "waivers are no longer necessary to provide low cost devices to consumers," and, as a result, "the Commission has provided no valid justification for granting [the Evolution] waiver."<sup>16</sup> Petitioners support their conclusion by referencing a Comcast Corporation Earnings Conference Call in April of this year,

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<sup>14</sup> For example, Cisco/Scientific Atlanta and Motorola fully support the SimulCrypt open standard in other parts of the world, and their headend equipment could facilitate the interoperability of multiple conditional access vendors on their existing networks. But the set-top boxes for which they seek a waiver use proprietary conditional access security technology that is not open to market competition (see *Exhibit 2* and *Exhibit 3*, respectively).

<sup>15</sup> Michael Harris, *The Comcast DTA Dance*, Sept. 12, 2008, available at [http://www.lightreading.com/document.asp?doc\\_id=163600](http://www.lightreading.com/document.asp?doc_id=163600) (last visited Jul. 8, 2009).

<sup>16</sup> *Petition for Reconsideration* at 5.

where a Comcast representative stated that the set-top boxes in their system cost “roughly \$30.”<sup>17</sup>

According to Petitioners, this presents irrefutable evidence that the need to provide low-cost devices to consumers “is no longer characteristic of the market.”<sup>18</sup> In making this assertion, Petitioners ignore substantial evidence in the record supporting the Commission’s conclusion that waivers remain necessary to provide low-cost devices to consumers. This is manifestly true in small markets and rural areas served by small and medium-sized cable operators. For example, in support of Evolution’s petition for waiver, the American Cable Association noted “the critical need for the continued availability of low-cost integrated set-top boxes in lower-density and rural markets.”<sup>19</sup> Baja Broadband commented that “cable operators serving low-density and rural markets find it difficult to increase digital penetration due to the high cost of non-integrated set-top boxes.”<sup>20</sup> And Frankfort Plant Board commented that it was “unable to lower the price of its digital offering because the least expensive digital set-top box available...costs Frankfort Plant Board \$209 per unit...”<sup>21</sup>

Further, it is Evolution’s belief and understanding that Comcast deploys their “roughly \$30” digital terminal adapters (DTA) without any form of content protection.<sup>22</sup>

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<sup>17</sup> *Petition for Reconsideration* at 5 (citing Thomson Financial, Transcript of Q1 2009 Comcast Corporation Earnings Conference Call, Apr. 30, 2009, p. 6).

<sup>18</sup> *Petition for Reconsideration* at 5.

<sup>19</sup> Letter from Matthew M. Polka, President, American Cable Association, to Kevin J. Martin, Chairman, Federal Communications Commission at 1 (filed Jun. 11, 2008).

<sup>20</sup> Letter from Steve Delgado, Chief Operating Officer, Baja Broadband, to Kevin J. Martin, Chairman, Federal Communications Commission at 1 (filed Jun. 11, 2008).

<sup>21</sup> Letter from Hance Price, General Counsel, Frankfort Plant Board, to Kevin J. Martin, Chairman, Federal Communications Commission at 1 (filed Jun. 11, 2008).

<sup>22</sup> Michael Harris, *The Comcast DTA Dance*, Sept. 12, 2008, available at [http://www.lightreading.com/document.asp?doc\\_id=163600](http://www.lightreading.com/document.asp?doc_id=163600) (last visited Jul. 8, 2009).

Evolution firmly believes that a high level of content protection is required on all digital devices in order to allow operators to meet their contractual obligations with the content providers, and ensure that theft of service can be minimized or eliminated.

The foregoing and the record in this proceeding overwhelmingly support the Commission's conclusions that waivers continue to be necessary to provide low-cost devices to consumers, and Petitioners' claims to the contrary must fail.

**C. The Commission properly interpreted precedent, concluding that past orders adopted a low-cost, limited-capability standard for set-top box waivers.**

Petitioners claim that the *Evolution Order* misinterpreted precedent and failed to conduct an appropriate public interest determination.<sup>23</sup> Petitioners argue that the Commission erred in declaring that its *2005 Deferral Order*<sup>24</sup> set a waiver standard for certain low-cost, limited-functionality set-top boxes.<sup>25</sup> Petitioners state that the Commission must now determine "whether low-cost, limited capability boxes should be subject to the integration ban or whether cable operators should be permitted to offer such low-cost limited capability boxes on an integrated basis."<sup>26</sup>

As summarized below, the Commission fully described and analyzed the public interest benefits of waivers for low-cost, limited-capability set-top boxes in the *Evolution Order*. The Commission even took measures to ensure that a competitive market for

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<sup>23</sup> *Petition for Reconsideration* at 6.

<sup>24</sup> *Implementation of Section 304 of the Telecommunications Act of 1996: Commercial availability of Navigation Devices*, 20 F.C.C.R. 6794, 6814-15 (2005) ("*2005 Deferral Order*").

<sup>25</sup> *Petition for Reconsideration* at 6-7. (Specifically, Petitioners contend that the Commission ignored its *2005 Deferral Order's* promise to make a determination on (i) whether it would serve the public interest to grant any waivers of the Integration Ban, including for low-cost, limited-capability set-top boxes; and (ii) whether such waivers would undermine the development of an innovative and competitive market for cable set-top boxes.)

<sup>26</sup> *Petition for Reconsideration* at 7.

these devices exists. Here, again, Petitioners claims ignore the record and the Commission's well-reasoned analysis therein.

**Public interest benefits.** The *Evolution Order* specifically referred to the *2005 Deferral Order* and its attempt to "strike the proper public interest balance" to address the specific government interest in "preserving a low-cost set-top box option for subscribers that allows them to view digital cable programming on analog television sets."<sup>27</sup> The Commission also affirmed the *2005 Deferral Order's* conclusion that the availability of low-cost, limited-capability set-top boxes furthers the cable industry's migration to all-digital networks by freeing up spectrum and increasing the availability of high-definition television.<sup>28</sup>

Petitioners erroneously claim that "there is no evidence that any of the benefits the Commission tentatively identified [in the *2005 Deferral Order*] remain compelling in June 2009."<sup>29</sup> As documented in Commission proceedings, the inability of small and medium-sized cable operators to purchase low-cost set-top boxes prevents many of them from transitioning their systems to all-digital and reclaiming valuable bandwidth. This, in turn, prevents these operators from providing more high-definition video programming, deploying advanced services such as Voice-over-Internet Protocol telephony, and providing faster broadband speeds – many consumers in rural and smaller markets lack access to such services. To conclude that there is no evidence that the benefits the Commission identified in its *2005 Deferral Order* remain compelling is, quite simply, preposterous.

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<sup>27</sup> *Evolution Order*, ¶12.

<sup>28</sup> *Id.*

<sup>29</sup> *Petition for Reconsideration* at 11.

**Competitive market for navigation devices.** The *Evolution Order* also reiterated that the availability of low-cost, limited-capability set-top boxes would not endanger the development of a competitive marketplace for navigation devices. The Commission emphasized that the more advanced devices offered by cable operators for primary home use would remain required to support CableCARD technology – just like the devices consumer electronics manufacturers offer in the retail market.<sup>30</sup>

While the Commission’s *Evolution Order* recognized “the potential competitive implications” of a general – as opposed to an operator-specific – waiver, the Commission created a streamlined and expedited process for future low-cost, limited-capability waiver petitions to “ensure that other manufacturers with similar devices can enter and compete as quickly as possible.”<sup>31</sup> The Commission therefore took steps to ensure a competitive marketplace for low-cost set-top boxes.

Petitioners’ claims are baseless in law and fact, as the Commission properly interpreted precedent in issuing the *Evolution Order*.

**D. The Evolution set-top boxes at issue will always be one-way devices incapable of being upgraded to provide any kind of advanced functionality.**

Petitioners claim that the Commission failed to take proper precautions to prevent manufacturers and cable operators from expanding the capabilities of set-top boxes deployed pursuant to the *Evolution Order*.<sup>32</sup> Petitioners’ concern is that devices receiving a low-cost, limited-capability waiver may later acquire additional flexibility

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<sup>30</sup> *Evolution Order*, ¶ 12.

<sup>31</sup> *Id.*, ¶ 15.

<sup>32</sup> *Petition for Reconsideration* at 12.

through cable operator hardware or software upgrades.<sup>33</sup> For example, Petitioners refer to a waiver petition application submitted to the Media Bureau by Motorola for a set-top box with “unspecified downloadable capabilities.”<sup>34</sup>

While Evolution cannot speak for other manufacturers or vendors, the Evolution set-top boxes for which the Commission granted a waiver **will always be one-way devices** – there is no electrical or mechanical interface available on the device that could change this specification. Moreover, there is no latent or dormant functionality in the Evolution set-top boxes that can be “awakened” or otherwise activated through either hardware or software upgrades. Consequently, the Evolution set-top boxes are truly low-cost, limited-capability boxes incapable of being upgraded to provide any kind of advanced functionality.

### **III. Conclusion**

Petitioners’ arguments for overturning the *Evolution Order* have no basis in law, fact, or policy. The Commission’s well-reasoned analysis appropriately recognized that consumers are the true beneficiary of low-cost, limited-capability waivers – especially those served by small or medium-sized operators in rural and smaller markets. For the reasons set forth herein, Evolution respectfully urges the Commission to deny Petitioners’ *Petition for Reconsideration*.

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<sup>33</sup> *Id.*

<sup>34</sup> *Id.*

Respectfully submitted,

By:



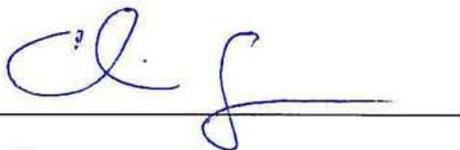
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July 9, 2009

Attorneys for Evolution Broadband, LLC

**DECLARATION OF CHRIS EGAN  
EXECUTIVE VICE PRESIDENT  
EVOLUTION BROADBAND, LLC**

1. I serve as the Executive Vice President of Evolution Broadband, LLC.
2. I have read the Opposition to the Petition for Reconsideration to which this Declaration is attached, and the facts contained therein are true and correct to the best of my knowledge, information, and belief.

A handwritten signature in blue ink, appearing to be 'CE', written over a horizontal line.

Chris Egan  
Executive Vice President

July 9, 2009

**EXHIBIT 1**

FCC  
Federal Communications Commission  
of United States

Vår ref./our ref.

Deres ref./Your ref.

Dato/date

July 09, 2009

### **MARKET MESSAGE – July 2009**

Conax Conditional Access (CA) is fully compliant with DVB Simulcrypt Open standards, and is currently deployed in over 300 systems worldwide with over 30 million smart cards in operation. In addition to the stand alone installations, the Conax CA system are deployed with over 20 system operators that are running multiple CA systems on the same network, in some cases, even with 3 or more. This allows the operator full flexibility to choose from literally hundreds of set-top box manufacturers.

Conax has licensed over 200 set-top box manufacturing companies with Conax Conditional Access licenses, and of which a number are members of the Consumer Electronics Association. Conax strongly believe that the best way to ensure large scale transition to all-digital networks in North America, is to ensure a competitive environment with vendors competing on an Open Standard basis. This has proven very successful in many markets worldwide.

Conax is open to working with Motorola and Cisco, to provide a seamless transition to a Simulcrypt environment, for those US cable operators looking to source low cost set-top alternatives. Conax is also fully supportive of the FCC's separable security Cablecard Initiative, and has developed a MCard which is currently in the certification process with Cablelabs.

Best Regards,

  
Mr. Geir Bjørndal  
EVP Sales and Marketing  
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**EXHIBIT 2**

**Subscriber Networks**

## **Model D-PCG1000™ PowerKEY® CAS Gateway**

### **Description**

The Model D-PCG1000™ PowerKEY® Conditional Access System Gateway (PCG) performs real-time PowerKEY entitlement control message (ECM) generation and distribution. The PCG operates within the DVB® Simulcrypt headend reference model. The PCG acts as an Entitlement Control Message Generator (ECMG) that uses the standard ECMG-to-Simulcrypt Synchronizer (SCS) interface. Optionally, the PCG can also perform Event Information Scheduler (EIS) functions using the EIS-to-SCS interface.



By using these standard interfaces, the PCG can be integrated with headend equipment from multiple vendors. Using the PCG allows you to run PowerKEY Conditional Access along with other conditional access systems in a mixed environment.

The Digital Network Control System (DNCS) configures the PCG and manages sessions on the PCG in much the same way as on QAM devices. However, unlike the QAM devices, a single PCG device can provide ECM generation for all digital broadcast sessions in a cable system.

The PCG is a PC-based product (preloaded with Red Hat Linux OS.) A 1U rack-mounted PC is used, appropriate to a cable headend environment. Two Ethernet connections are available.

### **Features**

- Creates Integrated PowerKEY Conditional Access ECMs
- Complies with the Simulcrypt 3.0 Interface
- Supports 250 Broadcast Sessions at a 4-second Cryptocycle
- Reports all DVB ECMG-to-SCS and EIS-to-SCS errors using alarms to the DNCS. An alarm is generated if the SCS stops requesting new ECMs
- Contains two 10/100/1000BaseT network interfaces for remote provisioning, control, status monitoring, and alarms

# Model D-PCG1000™ PowerKEY® CAS Gateway (PCG)

## Back Panel Connectors



## Specifications

### PowerKEY Specifications

ECM Generation	Supports 250 broadcast sessions at a 4-second cryptocycle
PowerKEY ECM/EMM Handling	As per PowerKEY Book 1 Specifications
MSK/ISK Decryption Rate	Up to 10 per second (RSA 1024-bit private operation)
Maximum Session Set-Up Rate	10 sessions/second
ECMG-to-SCS Interface	<ul style="list-style-type: none"><li>• Per DVB Simulcrypt specification (ETSI TS 103 197: Digital Video Broadcasting, Headend implementation of DVB SimulCrypt)</li><li>• Multiple SCS connections allowed supporting distributed SCS and redundancy</li><li>• SCS IP address configurable using the DNCS</li></ul>
EIS to SCS Interface	Per DVS-278 specification (SCTE DVS/278: Head-end Implementation of OpenCAS)
PowerKEY Conditional Access System	Secures digital services using symmetric encryption algorithm for content protection and strong authentication and digital signature for entitlement delivery

### Connector Specifications

Ports	<ul style="list-style-type: none"><li>• Two 10/100/1000BaseT network interfaces</li><li>• One PS2 keyboard port</li><li>• One VGA video port</li><li>• Two USB 2.0 ports</li></ul>
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### Electrical Specifications

Powering	90 VAC to 253 VAC 50/60 Hz
Power Consumption	345 Watts
Electrostatic Shock	No damage from five discharges of 15 KV IEC electrostatic discharge model [150 Pico-Farad (pF) + 150 ohm] to all exposed connections
RFI/EMI Emission	<ul style="list-style-type: none"><li>• FCC part 15 sub part B class A</li><li>• EN50083-2</li></ul>

# Model D-PCG1000™ PowerKEY® CAS Gateway (PCG)



## Environmental Specifications

Temperature Range	32°F to 122°F (0°C to 50°C)
Cooling	Self contained fans provide sufficient cooling to operate in a 19-in. (483 mm) rack without the need for a 1 RU spacer between units
Storage Temperature	14°F to 158°F (-10°C to +70°C)
Operating Humidity	5% to 95% non-condensing

## Mechanical Specifications

Dimensions	<ul style="list-style-type: none"><li>• One rack unit</li><li>• 19 in. W x 1.75 in. H x 19 in. D 483 mm W x 44 mm H x 483 mm D</li></ul>
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## Regulatory Specifications

Safety	<ul style="list-style-type: none"><li>• UL 1419 Listed</li><li>• UL 60950-1 Listed</li></ul>
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## Ordering Information

Contact your Sales Representative for product availability in your area.

Description	Part Number
Model D-PCG1000 PowerKEY Conditional Access System Gateway (PCG)	4019240



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Part Number 7011535 Rev A  
April 2007

**EXHIBIT 3**

# APEX1000

## All-Purpose Edge QAM



### Physical Chassis

1 RU chassis with support for up to 48 DRFI-compliant QAM channels, up to three removable and hot-swappable QAM modules per chassis (two block upconverted RF ports per QAM module)

### QAM Modules

Available in 2x4 configuration (up to four QAM channels per port), 2x8 configuration (up to eight QAM channels per port), and a QAM module software upgrade to field-convert a 2x4 module to a 2x8 module

### Power Consumption

Extremely low power consumption (<4.5 W/QAM channel when fully loaded, 216 W typical)

### GigE Interface

Four GigE interfaces (SFP slots) with support for IGMPv3 and transport stream redundancy

### Power Supplies

Supports up to two hot-swappable redundant load-sharing power supplies (system can operate with either one or two); supports two AC, two DC, or either 1 AC or 1 DC

### Encryption and Conditional Access

- Supports full MediaCipher® encryption and conditional access as well as CTE for VOD scrambling in both MediaCipher and SCTE-52 modes
- Software upgradeable to CSA and AES encryption; capable of supporting third-party encryption through DVB Simulcrypt

### Full Video EQAM Feature Set

- De-jittering of CBR and VBR input streams
- Receive either MPTS or SPTS
- Transmit MPTS
- Support for MPEG remultiplexing, PID remapping, PSI generation, and PSI monitoring
- Software upgradeable to support PSIP fixing and SCTE-18 EAS
- Supports SNMP for configuration, control, alarms, and traps

### SDV and VOD Standards

Supports the NGOD and TWC specifications

### M-CMTS Standards

Software upgradeable to support the M-CMTS interfaces, including DTI, DEPI, and ERMI

The APEX1000 offers cost-effective and power-efficient multiplexing, encryption, and QAM/RF upconversion in a high-density platform.

### High-Density EQAM for Full-Featured, Cost-Effective Video and Data Services

The APEX1000, Motorola's next-generation all-purpose edge QAM, provides flexibility, high availability, high QAM density, MediaCipher encryption, and low power in an extremely cost-effective 1 RU platform. Up to three removable and hot-swappable QAM modules can be installed in the chassis. Each module provides two RF ports, which support up to eight QAM channels each. Any of the 48 QAM channels available can be used for Video-on-Demand (VOD), Switched Digital Video (SDV), broadcast services, or DOCSIS® high-speed data (through support for the M-CMTS architecture).

The APEX1000 provides four SFP slots, allowing for up to four optical or electrical GigE inputs. This also allows the APEX1000 to support full transport stream redundancy covering all 48 QAM channels.

The APEX1000 supports the NGOD R6 and D6 interfaces as well as the TWC SDV interfaces, allowing it to function as an SDV edge QAM in any NGOD or TWC cable network.

In addition, the APEX1000 performs network de-jittering, MPEG multiplexing, message insertion, and PSI generation following MPEG-2 transport specifications.

## SPECIFICATION SHEET

### APEX1000

All-Purpose Edge QAM

#### MODULAR CHASSIS

Chassis Height	1 RU
Dimensions	1.7 in x 19.0 in x 24.9 in
Weight	23 lb (fully loaded)
QAM Modules	Up to three per chassis; purchase 2x4 or 2x8 modules; software upgrade 2x4 to 2x8
Hot-Swappable	Yes
RF Ports	Two per QAM module
QAM Channels per RF Port	
2x4 module	Up to four
2x8 module	Up to eight

#### POWER

Power Supplies	Up to two per chassis
Load Sharing	Yes
Redundant	Yes
Hot-Swappable	Yes
Configurations	One or two AC One or two DC
AC Power Supply	100 to 240 VAC, 50/60 Hz
DC Power Supply	-40 to -75 VDC
Power Consumption	<4.5 W/QAM channel fully loaded (216 W typical)

#### ENVIRONMENTAL

Operating Temperature	0 °C to 40 °C
Storage Temperature	-40 °C to 70 °C
Cooling	Five fans, front-to-back airflow
Operating Humidity	5% to 95%

#### FEATURES

Broadcast Video	Supported
VOD/SDV	NGOD, TWC, and UDP port mapping configurable on a per-QAM-channel basis
M-CMTS	DEPI, DTI, ERM1
Encryption and CA	MediaCipher and SCTE-52, Broadcast and CTE (for VOD); upgradable CSA and AES encryption and DVB Simulcrypt
Configuration/Control	Element Manager (SNMP), Motorola SDM (SNMP), console port (RS-232)

#### GIGABIT ETHERNET INPUT/OUTPUT

GigE MPEG Data	Receive only
Physical Ports	Four SFP slots
IGMPv3	Supported
Optical SFP Support	850, 1310, 15xx nm
Electrical SFP Support	1000Base-T

#### FAST ETHERNET INPUT/OUTPUT

Physical Ports	Two RJ-45 Ethernet
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#### RF OUTPUT

ITU J.83 Annex A, B, C; DRFI	
QAM Constellations	256 QAM and 64 QAM
Center Frequency Range	57 to 999 MHz
Carrier Frequency Step Size	250 KHz
RF Level Step Size	0.2 dB
Maximum RF Output Level (software version 2.1.0 or higher)	
One active channel	62 dBmV
Two active channels	58 dBmV
Four active channels	54 dBmV
Six active channels	52 dBmV
Eight active channels	51 dBmV
Input Impedance	75 Ω

Individual Components		
Component	Description	Part Number
APEX1000 Chassis	QAM modules and power supply modules sold separately	540274-001
QAM Module (2x4)	Two RF ports per module enable up to four QAMs per port	540273-001
QAM Module (2x8)	Two RF ports per module enable up to eight QAMs per port	540273-002
Power Supply Module (AC)	AC power supply	540272-001
Power Supply Module (DC)	DC power supply	540271-001
Set Configurations		
APEX1000 V48 AC	Includes one APEX chassis, one AC power supply module, three 2x8 QAM modules	541928-001
APEX1000 V48 DC	Includes one APEX chassis, one DC power supply module, three 2x8 QAM modules	541928-002
APEX1000 V24 AC	Includes one APEX chassis, one AC power supply module, three 2x4 QAM modules	541928-003
APEX1000 V24 DC	Includes one APEX chassis, one DC power supply module, three 2x4 QAM modules	541928-004
QAM Upgrade		
QAM Module Upgrade	Field-convert a 2x4 QAM module to a 2x8 QAM module	540400-001



# MOTOROLA

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## CERTIFICATE OF SERVICE

I, Alma Hoxha, paralegal in the offices of Cinnamon Mueller, certify that a true and correct copy the Evolution Broadband Opposition to the Petition for Reconsideration, served on the following individuals by first class mail on July 9, 2009:

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