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# **CABOVISÃO S.A.**

## **Data Services Interface – Cable Modem (CM)**

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## 1 INTRODUCTION

The purpose of this document is to define Cabovisão's data networks subscriber interfaces, based on the CM (Cable Modem) device.

The following circuits are available:

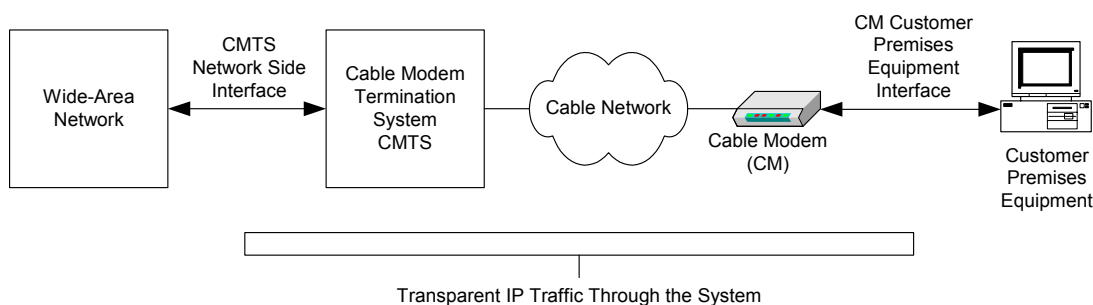
- One RJ-45 Ethernet port 10/100BaseT and one USB 1.1 port, for high-speed data connectivity;
- One female "F" type connector, for RF network connectivity.

## 2 STANDARDS AND RECOMMENDATIONS

The CMs are DOCSIS 2.0 (Data-Over-Cable Service Interface Specifications) compliant.

## 3 CABLE MODEM (CM)

The intended service will allow transparent bi-directional transfer of Internet Protocol (IP) traffic, between the cable system head-end and customer locations, over an all-coaxial or hybrid-fiber/coax (HFC) cable network. This is shown in simplified form in Figure 1.



**Figure 1 – DOCSIS 2.0 Reference Architecture**

The transmission path over the cable system is realized at the head end by a Cable Modem Termination System (CMTS) and at each customer location by a Cable Modem (CM). At the head end (or hub), the interface to the data-over-cable system is called the Cable Modem Termination System - Network-Side Interface (CMTS-NSI). At the customer locations, the interface is called the cable-modem-to-customer-premises-equipment interface (CMCI).

The CMCI interface can be either external or internal to the CPE.



### 3.1 CM Functional Requirements

There are other functional requirements placed on the cable modem beyond transparency to IP traffic, including the following:

- The cable modem must be capable of filtering all broadcast traffic from the local LAN, with the exception of DHCP (as identified by the destination port number in the UDP header) and ARP packets. This filtering function should be SNMP configurable as described in the DOCSIS Radio Frequency Interface (RFI) specifications;
- The ICMP packets must be passed upstream, unless they are required to be discarded according to filtering rules;
- Cable modems designed to support LAN segments containing other bridges should employ the Spanning Tree Algorithm and Protocol per ISO/IEC 10038 (ANSI/IEEE Std 802.1D): 1993, with modifications as described in the DOCSIS Radio Frequency Interface (RFI) specifications.

## 4 CM POWER REQUIREMENTS

### 4.1 Power Considerations

The basic method to power the CM is local. Local power refers to utilizing the subscriber's home AC utility power as the supply for the CM. Input should be 220-240 VAC at 50 Hz.

### 4.2 CM Average Power Requirements

The average CM power consumption should be less than or equal to 5 VA. The average power consumption refers to the typical long-term average consumption of the device. Note that an average power consumption of 5 VA is considered achievable in the near future as chip and CM designs become more integrated. Furthermore, less than or equal to 5 VA goals (approaching 3 VA) are achievable longer term without requiring changes in DOCSIS.

### 4.3 Service Requirements under AC Fail Conditions

Since data traffic is not considered a primary line service, data service may be deactivated immediately under local AC power fail conditions.



## 5 RF DOWNSTREAM

The RF downstream interface is DOCSIS 2.0 compliant:

Frequency Range	88 MHz to 860 MHz
Modulation	64-QAM or 256-QAM
Data Rate (Max.)	30,34 Mbps for 64-QAM 42,88 Mbps for 128-QAM
Bandwidth	6 MHz
RF Input Sensivity Level	-15 dBmV to +15 dBmV
Input Impedance	75 $\Omega$

## 6 RF UPSTREAM

The RF upstream interface is DOCSIS 2.0 compliant:

Frequency Range	5 MHz to 42 MHz
Modulation	QPSK 8-QAM, 16-QAM, 32-QAM, 64-QAM
Data Rate (Max.)	10,30 Mbps for QPSK 15,48 Mbps for 8-QAM 20,54 Mbps for 16-QAM 25,80 Mbps for 32-QAM 30,96 Mbps for 64-QAM
Bandwidth	200 kHz to 6,4 MHz
RF Output Level	+8 dBmV to 58 dBmV for QPSK +8 dBmV to 55 dBmV for QAM
Output Impedance	75 $\Omega$

## 7 REFERENCES

- [1] "Data-Over-Cable Service Interface Specifications – Version 2.0"  
Cable Television Laboratories Inc.  
Available at [www.cablemodem.com](http://www.cablemodem.com)