

Architecture Overview

The ARRIS C4[®] CMTS is a PacketCable™ 1.1/1.0, DOCSIS[®] 2.0, Euro-DOCSIS 2.0, DSG, and PCMM ready edge router that delivers unprecedented service availability and wire-speed performance under all operating demands. It enables operators to increase subscriber satisfaction and retention by providing 99.999% system availability and a design that sustains any system component failure without interruption of service. The C4 CMTS is engineered to support DOCSIS 1.1/2.0 and PacketCable features, providing operators with an unprecedented array of Quality of Service capabilities. Release 5.1 offers enhancement features to DOCSIS Channel Bonding operation by allowing multiple choices in bonding group size.

The C4 CMTS is built on a 21 slot chassis with a mid-plane based architecture designed for continuous system operation. This unique architecture allows the C4 CMTS to provide carrier-grade integrated Layer 3 edge routing and advanced CMTS functionality combined in a single chassis. Four types of active modules are included in a complete C4 CMTS system (SCM – System Control Module, FCM – Fabric Control Module, NAM – Network Access Module, and CAM – Cable Access Module) and each module resides in a front slot of the C4 CMTS chassis.

Wideband Application Enhancements

Release 5.1 builds upon the leadership established by C4 FlexPath™ software initially offered in Release 5.0.

Release 5.1 adds numerous deployment related enhancements that speed deployment and enhance subscriber experience with fewer changes to an MSO's existing systems. The C4 FlexPath software, in conjunction with the Touchstone[®] Wideband Modem WBM650 is now easily deployed in networks with bandwidth limitations. This is accomplished by allowing multiple bonding group sizes in both the upstream and downstream. Channel bonding of packets is now available in 4x4, 3x3, 2x2 and 4x Virtual1, providing very high data throughputs between the cable operator and the subscribers' premises. The Touchstone Wideband Modem WBM650 is a DOCSIS 2.0 or Euro-DOCSIS 2.0 (A-TDMA and S-CDMA) ready cable modem with speeds much faster than DSL service, and up to four times faster than regular DOCSIS high speed cable modems.



Superior Throughput and Availability

All modules in the C4 CMTS are designed for “hot-swap” operation and can be inserted or removed while the system remains powered and in operation. The C4 CMTS features a 6.4 Gbps hardware switch fabric capable of a sustained 6.28 Mpps forwarding rate even under fully loaded conditions. The programmable switch fabric design provides unique queuing and congestion control in hardware for wire-speed performance under 100% load conditions.

With “hitless” RF sparing, if a failure were to occur on any RF module all the devices connected to the failed module would immediately switch to a spare in the group. Up to seven sparing groups can be provisioned in the same chassis to allow an operator to “mix and match” sparing requirements of various sizes. In addition, the C4 CMTS with hitless software upgrade functionality can deploy new system releases without affecting subscriber services.

Superior Density & Scalability

The C4 CMTS supports data capacity of up to 4,500 cable modems per downstream (52,000 cable modems per chassis) or voice capacity of up to 1,800 lines per downstream (32,000 lines per chassis). The high-density DOCSIS 2.0 (2DX12U) RF module provides the industry's highest density in a 7' rack (96DX576U) with full flexibility of upstream/downstream mapping per CAM.



- **Meet subscriber demands for new Very High Speed Data (VHSD)**
- **Uncover new revenue opportunities in delivering differentiated and dynamic services such as streaming IP video**
- **Reduces operational costs while supporting advanced services with unmatched system scalability**
- **Increase subscriber satisfaction and retention with carrier-grade reliability and superior service performance**
- **Support DOCSIS 2.0, Euro-DOCSIS 2.0 and PacketCable 1.0/1.1 Standards**

Specifications

Visit www.arrisi.com for more information

Ordering Information

070622_C4_CMTS_release5_1.doc
Issue 2.0

ARRIS C4[®] Cable Modem Termination System Software Release 5.1



Installation Environment:	RF Interfaces External 'F' type connector Network Interface Dual RJ-45 Ethernet connections Network-side Interfaces . 10/100 BaseT Ethernet; Gigabit Ethernet Power..... Dual dc voltage mains: -48 V dc (-44 to -72 V dc) Optional ac power configuration Power Consumption..... 2800 W max at -48V dc.	C4 Chassis, 21 Slot Chassis Assembly 14RU Chassis, 3 high speed fans..... 713877
RF Downstream:	Frequency Range (MHz).....91-857 (DOCSIS 2.0); 112-858 (Euro-DOCSIS 2.0) Modulation (QAM)..... 64, 256 Data Rate (Mbps) (Max.) 30.34 – 55.62 RF Output Level (dBmV).....50-61	System Control Module II (SCM II) 718100 Physical Interface Card (PIC) for slot 19 For use w/ SCM w/ fan controller..... 708369 Physical Interface Card (PIC) for slot 20 For use w/ SCM w/o fan controller..... 708963 Physical Interface Card (PIC) for 8-Ethernet Port & 2 GBIC ports 710459 Fabric Control Module (FCM) 708367 Network Access Module (NAM) 4 x 10/100 Base T 708149 Gigabit Ethernet NAM w/ 1-Port LLX long haul GBIC Module (70km) 719151 Gigabit Ethernet NAM w/ 1-Port LX medium haul GBIC Module (10km) 719152 Gigabit Ethernet NAM w/ 1-Port SX short haul GBIC Module (550m) 719156 Gigabit Ethernet NAM w/ 1-Port TX electrical GBIC Module (100m) 719149 2Dx12U Cable Access Module (CAM) DOCSIS 2.0 719356 CAM Physical Interface Card (PIC) for even-slot position..... 710424 CAM Physical Interface Card (PIC) for odd-slot position..... 710425 CAM Physical Interface Card (PIC) for spare-slot position..... 710426
RF Upstream:	Frequency Range (MHz).....5-42 (DOCSIS 2.0); 5-65 (Euro-DOCSIS 2.0), or 5-55 Modulation QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM Data Rate (Mbps) (Max.) up to 30.72 Receive Input Level (dBmV) -16 to 29	
Physical:	Operating Temperature: Short Term °F (°C)..... +23 to +131 (-5 to +55) Long Term °F (°C) +41 to +104 (+5 to +40) Storage Temperature °F (°C)..... -40 to +158 (-40 to +70) Operating Humidity (Min.-Max.) 5-85% (Non condensing) Dimensions (H x W x D) in. (cm)..... 24.5 x 17.4 x 20.0 (62.2 x 44.2 x 50.8) Weight lbs. (kg) 150 (68)	
Software Support: Release 5.1	DOCSIS 2.0 Euro-DOCSIS 2.0 (A-TDMA & S-CDMA) PacketCable 1.0/1.1 DOCSIS Set-top Gateway (DSG) PacketCable Multimedia (basic) Support RIPv2 (RFC 1723), OSPFv2 (RFC 2328), BGP4, IS-IS DHCP Relay Agent (Option 82) ICMP (RFC 792) ECMP (Equal Cost Multipath Load Balancing) CIDR (Classless Inter-Domain Routing) (RFC 1519) PIM-SSM, IGMPv2, and multicast flows (RFC1112) Virtual Route/Forwarding Instances (VRFs) Subinterfaces 802.1Q VLAN tagging* FlexPath™ wideband channel bonding (up to 4 DS and 4 US) IEEE 802.1p priority bit mapping Interface Bundling across any number of RF interfaces Command Line Interface (CLI) SNMP v1, v2c and v3 DOCSIS MIBs and enterprise MIBs Dynamic Cable Modem Load Balancing Integrated Upstream Agility Lawful Intercept (SII Encapsulation) Flexible Full US to DS Mapping within CAM Telnet, SSH2, and SFTP IP DiffServ Advanced CM Config File Verification Cable Modem Proxy Extended ACLs, IGMP ACLs & Named ACLs * Optional Software Support – Licensed separately per C4 downstream	
Regulatory:	Designed to NEBS Level 3 Requirements Safety: UL [®] 60950, CSA C22.2 No. 950, IEC60950 EMC: GR-1089-CORE (ESD, Grounding Electrical Safety) FCC Part 15 Class A, EN300 386-2 (CISPR 22, Class A) Environmental: GR-63-CORE, ETS 300 019	

Software required for each CMTS:

C4 CMTS System Software Rel 5.1	
License per Downstream	721155

Optional Software:

C4 802.1Q VLAN Software Option Rel 5.1	
Licensed per Downstream.....	721157

Maintenance Plan (required):

Software Maintenance - Phone Plus Silver.....	708385
Software Maintenance - Phone Plus Gold.....	708387

Optional Items & Spares:

High Speed Fan Tray.....	713863
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