*The **Entra** SC-2D Access Node is a key component of the Entra unified cable access solution, a Distributed Access Architecture (DAA) that delivers significant performance gains, substantial savings on capital and operating expenses (CAPEX/OPEX), and enables an easy migration to an all-IP, all-fiber network. Configurable in software to function as either an R-PHY or R-MACPHY device, the SC-2D Access Node provides cable operators maximum architectural flexibility.*

The Entra SC-2D Access Node is an essential element of Entra's virtualized Distributed Access Architecture for cable networks. The Entra SC-2D Access Node performs cable-specific functions typically carried out in the Converged Cable Acess Platform (CCAP). It is "Flexible MAC Architecture (FMA) Ready," and can be software configured as either a Remote-PHY device, handling RF modulation, or a Remote-MACPHY device, performing RF modulation and DOCSIS processing.

It enables operators to cost effectively add DOCSIS channels, splitting nodes and service groups. Cable operators can deliver services to all customers without adding equipment in congested hubs and headends.

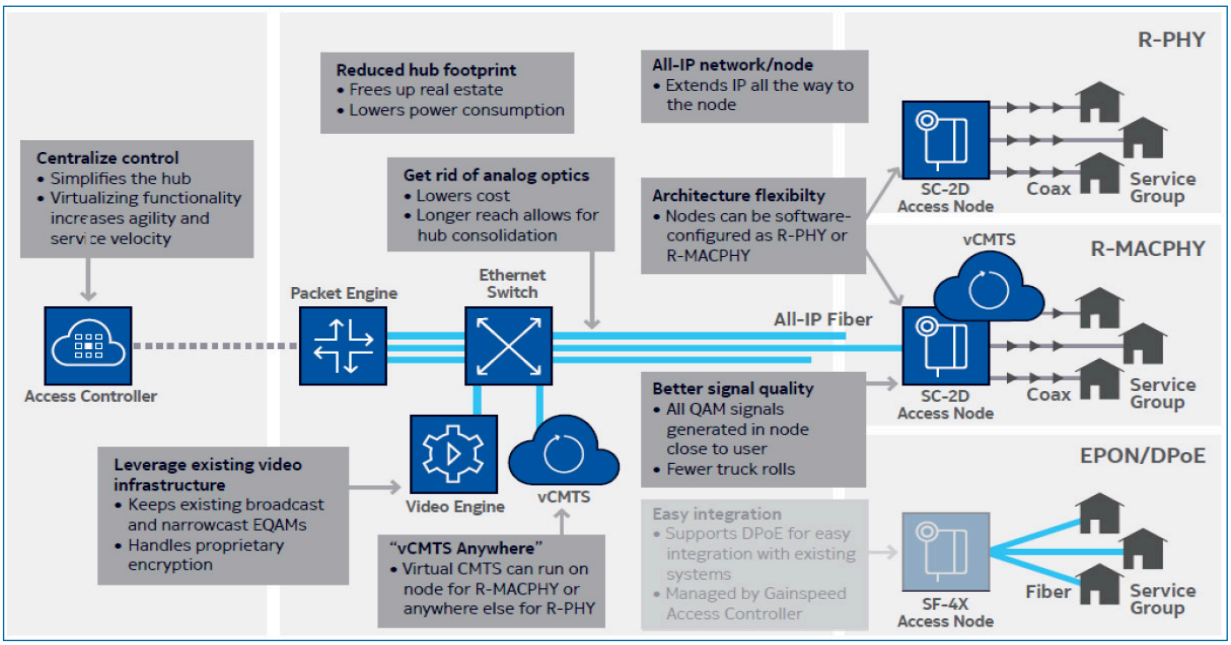
The Entra SC-2D Access Node supports full spectrum DOCSIS 3.1 and support for existing video services, making it ideal for high-capacity business and residential services. It features modular port configurations for 2 or 4 RF ports and is available with a variety of splits. The node also features a hot-swappable modular design for greater serviceability.

Housed in an aluminum alloy die-cast enclosure, the Entra SC-2D Access Node is designed to operate in harsh outdoor environments.

Entra SC-2D ACCESS NODE

Highlights

- Software-defined universal “R-PHY/R- MACPHY” access node
- Supports full spectrum DOCSIS 3.0 & 3.1
- Modular RF port configuration options (2- or 4-port) and up to two 10 GE SFP+ interfaces
- Supports up to 2 downstream and 2 upstream DOCSIS Service Groups/node
- Supports existing video services (broadcast, VoD, SDV, nPVR), Wideband Digital Forward to broadcast RF over IP, Up to 4 NDF/NDR/OOB/HMS, Optical Receiver (Video RF Overlay)
- Hot-swappable modular design; Field- replaceable components including amplifier modules, power supply unit and main processor module
- Hardened OSP enclosure, line-powered with strand and pedestal mount options
- Flexible architecture allows operators to deploy vCMTS as best-suited per use case
- Increased fiber capacity and management enables higher service tiers including gigabit services
- Centrally managed and controlled by Entra Access Controller as part of the unified cable access solution
- Digital hub-to-node link dramatically improves signal-to-noise ratio (SNR) and carrier-to-noise ratio (CNR)
- Support for video services preserves legacy EQAMs and installed set-top box base
- Remote configuration and management increases operational agility



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Technical specifications

Interfaces

Up to 4 RF ports (75 ohm)
2 ports of 10 GE
Service Groups & Ports : 2 forward x 2
reverse x 2 or 4 RF ports

Supported SFP+ Optical Modules

ER, LR, ZR, Bi-directional
CWDM
DWDM
10GPON*

Physical Dimensions

Height: 265mm (10.4in)
Width: 529mm (20.8in)
Depth: 280mm (11.0in)
Weight: 19.5kg (44lb)

Operating Environment

Temperature: -40°C to 60°C (-40°F to 140°F)
Relative humidity: 5% to 95% non- condensing
Altitude: -196 to 13,123 feet (−60 to 4,000 meters)

Storage Environment

Temperature: -40°C to 70°C (-40°F to 158°F)
Relative humidity: 5% to 95% non-condensing
Altitude: -196 to 13,123 feet (−60 to 4,000 meters)

Power Requirement

Consumption: 123W nominal with 2 coax ports active, 148W nominal with 4 coax ports active, 157W maximum
Input frequency: 50Hz/60Hz
Input voltage: 38 V to 90 VAC coax line power (quasi-squarewave)

Mounting Options

Aerial, pedestal
Wall, pole, rack mount with accessory bracket
Vertical or horizontal cooking

Regulatory, industry and standards compliance

Immunity

EN 61000-4-2 Electrostatic Discharges
EN 61000-4-3 Continuous Radiated Disturbances
EN 61000-4-4 Electrical Fast Transients
EN 61000-4-5 Surges
EN 61000-4-6 Continuous Conducted Disturbances
EN 61000-4-8 Power-frequency Magnetic Fields
EN 61000-4-11 Voltage Dips and Interruptions
IEEE C62.41/C62.45 Combination Wave Category B3
6kV / 3kA (Coax Ports)
IEEE C62.41/C62.45 Ring Wave Category B3 6kV / 500A (Coax Ports)
ITU-T K.45, K.44 Basic, Enhanced
ANSI/SCTE 82 2012

Safety

Evaluated to IEC 60950-1:2014 (Second Edition), Am1:2009 + Am2
UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements);
CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements);
IEC 60950-1, Second Edition, 2013-05-01;
EN 60950-1, 2013/10/01;
CSA C22.2 No. 60950-22, Edition 1, 2011/12/01;
UL 60950-22, Edition 1, 2011/12/19;
IEC 60950-22, First Edition, 2005/10/01;
EN 60950-22, 2008-01/01
CE, CB SchemeIP Rating : IP-68 Rated

Outdoor Use

Pollution Degree PD2
IEC 60950-22, First Edition, 2005/10/01;
EN 60950-22, 2008-01/01
IP68 rated

Emissions

FCC 15.109(b), Compliant with Class B limits
ICES-003
EN 55032
AS/NZS CISPR 32
VCCI-CISPR 32

Surge

ANSI/SCTE 81 2012
ITU-T K.45 Basic and Enhanced
IEEE C62.41 Cat B, Combination 6kV/3kA; Ring wave 6kV/500A

Industry Standards

CableLabs CM-TR-R-MACPHY Remote MAC-PHY
CableLabs CM-SP-FMA-D07 FMA System Specification
CableLabs CM-SP-FMA-MMI-D03 FMA MAC Manager Interface
CableLabs CM-SP-FMA-PAI-D04 FMA PacketCable Aggregator Interface
CableLabs CM-SP-FMA-OSSI-D01 FMA OSSI
Distributed CCAP Architecture (DCA) MHAv2 Specifications
CableLabs CM-SP-R-PHY Remote PHY Specification
CableLabs CM-SP-R-DEPI Remote Downstream External PHY Interface Specification
CableLabs CM-SP-R-UEPI Remote Upstream External PHY Interface Specification
CableLabs CM-SP-R-GCP Generic Control Plane Specification
CableLabs CM-SP-R-DTI Remote DOCSIS Timing Interface Specification
CableLabs CM-SP-R-OOB Remote Out-of-Band Specification
CableLabs CM-SP-R-OSSI Remote PHY OSS Interface Specification
CableLabs CM-SP-DRFI Downstream RF Interface Specification, Appendix D
ANSI/SCTE 46 2007
ANSI/SCTE 91 2015
ANSI/SCTE 02 2006
ANSI/SCTE 149 2013
MSA SFF-8432
MSA SFF-8431 Level III or higher
MSA SFF-8472

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Technical specifications

Quality

ISO 9001
TL 9000
ISO 14001
OHSAS 18001
ESD 20.20

Environmental

RoHS Directive 2011/65/EC
WEEE Directive 2012/95/EC

Reliability

Designed for five 9s of availability (99.999%)
Predicted MTBF > 327,866 hrs
Demonstrated MTBF > 750,000 hrs

RF Specifications

RF Ports

Up to 4 RF ports
Operational bandwidth : 5 MHz to 1,218 MHz

Splits

5 – 42 MHz / 54 – 1218 MHz
5 – 65 MHz / 85 – 1218 MHz
5 – 85 MHz / 102 – 1218 MHz
5 – 204 MHz / 258 – 1218 MHz

Downstream

Service Groups : Up to 2
Capacity : 2 X 160 D3.0 / 12 x 192 MHz D3.1
Channels : Up to 158 QAM J.83 Annex A/B/C; up to 6 OFDM per Service Group
Channel bandwidths: Up to 192 MHz OFDM

Output

Total Composite Power : Up to 71 dBmV
RF Output Level : 61 dBmV @ (virtual)
Up to 24 dB pluggable tilt (s/w readable ID)
MER : 46 dBmV typical
CTN : > 60 dBc
CIN : > 55 dBc

Out of band capabilities

Up to 4 channels of OOB, SCTE 55-1, SCTE 55-2, SCTE 25-1 HMS
Up to 160 CW pilot tones
Up to 2 leakage detection tags per Service Group
Viavi PathTrak support

Wideband digital forward

Up to 43 6MHz/32 8MHz channels of broadcast band transport over IP. Typical broadcast modulations 8VSB, PAL, FM, NTSC
CNR : 50 dB typical

RF impedence

75 ohm

Upstream

Service Groups : Up to 2
Capacity : 2X12 D3.0 / 4 x 96 MHz D3.1
Channels : Up to 12 QAM; up to 2 OFDMA per Service Group

Input

Input Levels: 27 dBmV to 7 dBmV
Isolation : > 65 dB
Rejection : > 65 dB

Diagnostics

Test Ports : -20 dB
Low RF level alarm per port
RF amplifier on/off controls per port
RF input on/off controls per port
Voltage and temperature monitoring

Optical Receiver Specifications

Optical Input

1260 – 1560 nm
2 to -6 dBm AGC Dynamic Range
SC-APC

RF Output

50 to 800 MHz
Flatness +/- 1 dB
CSO : 60 dB
CTB : 63 dB
Isolation : > 50 dB

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