1   GENERAL INFORMATION

1.1   Product description

The NCX device is a Network Audio Terminal which allow distribution of audio data ,over a standard Ethernet network. It can be managed by a single computer. Depending on the NCX model, each audio terminal can record/encode, play/decode, or is full duplex. Typical applications are:
- Corporate audio
- Listening stations/kiosks-music preview, education, libraries
- Public address, airport, train station
- Background, foreground music
- Informational, architectural audio, museum, theme park, zoo
- Others…

Depending of the application, different options are available:
- NCX200: 2 mono outputs
- NCX400: 4 balanced mono outputs
- NCX040: 4 balanced mono inputs (with mic/line level selection)
- NCX220: 2 mono in inputs (with mic/line level selection) and 2 mono outputs.

All options of NCX use the same printed circuit; Software is different, depending of the option.
All NCX comes with an external power supply block: Analog Vision PM1C050

Typical installation:
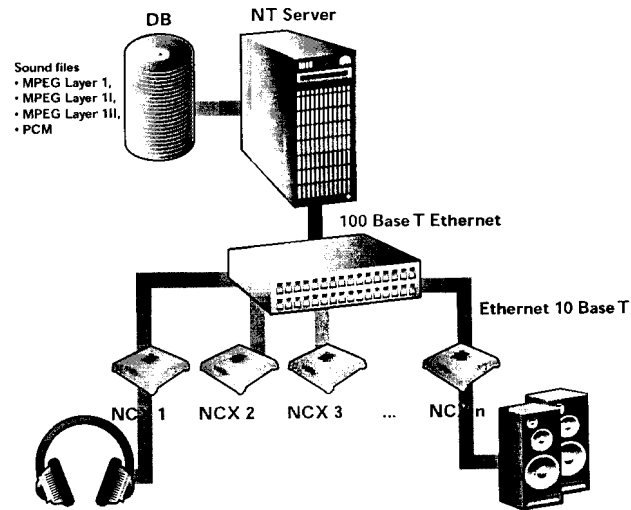
For more information, see product's data sheet at section 1.6.

1.2   Related Submittal(s) / Grant(s)

All host equipment used in the test configuration are FCC granted, when relevant.

1.3 Tested System Details

The FCC IDs for all equipment, plus description of all cables used in the tested system (including inserted cards, which have grants) are :

Trade Mark – Model Number (Serial number)	FCC ID	Description	Cable description
NCX220* (sn: 011900042)	IGTNCX	Audio terminal	All I/O cables are shielded except Cat5 Lan cable. Power supply block: PM1C050 (sn: 9900274)
HEWLETT PACKARD BRIO 6769A (sn: 28019902)	K4UVECTRAVL5	Personal computer	All data cables are shielded except power and Lan cables.
HEWLETT PACKARD D2846A (sn JP74001000)	D.O.C.	21" color monitor	Shielded video cable
HEWLETT PACKARD C4734 (sn: M97060579)	CIGE03614	Keyboard	Shielded cable
HEWLETT PACKARD C3751B (sn: LZA65353972)	DZL210582	Mouse	Shielded cable
Sennheiser HD435 (sn: none)	none	Headphone	Shielded cable

*Equipment Under Test

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-1992, CISPR22-1993/A1:1995 and EN55022:1994/A1:1995.
Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.5 Test facility

Tests have been performed on February 8th 2000.
The test facility used to collect the radiated and conducted data is the SMEE Actions Mesures facility, located ZI des Blanchisseries, 38500 VOIRON, France. This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4-1992 in a letter dated August 04, 1999 (registration number 94821).
This test facility has also been accredited by COFRAC (French accreditation authority for European union test lab accreditation organization), accreditation number 1-0844 as compliant with test site criteria and competence in EN55022/CISPR22 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.

1.6   Data sheet of the product

Specifications

NCX configuration

- Processors: Motorola 56303 at 80 MHz and AMD186ES.
- RAM: 256 kWords.
- The electronic components are housed into a metallic enclosure designed to comply with CE and FCC Class B electromagnetic compatibility requirements. This metallic enclosure is embedded into a plastic cover (flame retardant class UL V0).
- Audio output is currently provided on two phono (CINCH) connectors at line level and a 3.5 mm (mini) stereo jack at headphone level. A 15-PIN SUB-D connector is provided for balanced outputs and inputs.
- Overall dimensions (without power supply): 175 mm x 175 mm x 45 mm.
- Provided external power supply: 1.5 A, 5 VDC from 90 ~ 250 VAC. UL certified.
- Operating temperature/humidity (noncondensing): 0 to +50°C / 10 to 90%.

Ethernet network and server

- Standard 100baseT Ethernet IEEE803.3/ANSI 8802-3. A dedicated network is required that provides each NCX terminal having its own 10 Mbps link. To guarantee sound dropouts will not occur, a load factor of 30% of the total network bandwidth is used creating a data flow of up to 3 Mbps to each terminal.
- The use of a 100/10 Mbps Ethernet switch prevents collisions of messages intended for different NCX terminals.
- Each NCX terminal has a unique Ethernet ID. As the data path currently implemented is fully Ethernet, without bridges or routers, an IP address is currently not needed nor provided.
- Recommended application server specifications Pentium II / 400 MHz with 64 Mb RAM, EIDE or Ultra SCSI hard disk drives, Windows NT4, 100 BASE-T ethernet adaptor.

Ancillary communications and status

- Two RS-232 serial communications links appear on a 9-pin SUB-D connector to offer control flexibility. For example, one link can be used for a keypad/display and the other for a barcode reader. Models with four I/O connections may have each pair of connections controlled independently.
- A 15-pin SUB-D connector provides any combination of seven, user configurable TTL inputs and outputs for application and device control. In addition, 5 VDC is available on the connector (100mA max. internal fuse protection).
- LED indicators for power status, network activity and DSP status.
- Multiple, adjacent NCX audio terminals may share a common clock for sample accurate synchronization of the audio outputs.

Inputs/Outputs

- One stereo or two mono unbalanced outputs on phono (CINCH) connectors at line level. Maximum level +4 dBu.
- Balanced inputs and outputs on 15-PIN SUB-D connector. Maximum input/output levels: +10 dBu.
- Output level adjustment:
  +10dBu to -81.5dBu in 0.5 dB steps
  plus mute.
- Output impedance: < 100 Ω
- Input impedance: > 10 k Ω.
- Headphone output on 3.5 mm (mini) stereo jack. Source impedance: 600 Ω
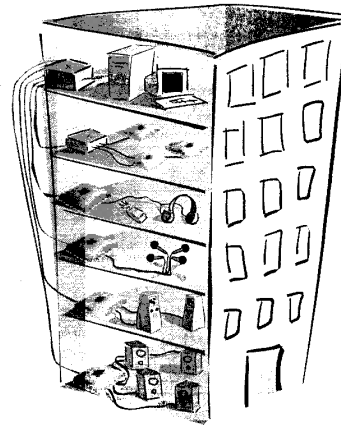
Network Audio Terminal
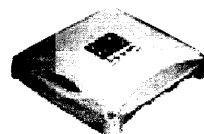
NCX
Network Audio Terminal

Audio specifications
- Sampling frequency from 8 kHz to 50 kHz in 0.5 % steps
- A/D and D/A converter resolutions: 24 bits (64-times oversampling, delta - sigma)
- Frequency response at 48 kHz (record + play): 20 Hz - 20 kHz ± 0.1 dB
- Signal to noise ratio (unweighted): > 92 dB
- Distortion + noise at 1 kHz (record + play): < - 88 dB (0.004%)
- Channel phase difference 20 Hz/ 20 kHz): 0.2°/2°
- Analog channel crosstalk (at 1 kHz): <-95 dB

System audio capabilities
- Real-time MPEG Layers I, II, and III decoding
- Real-time MPEG Layers I and II encoding
- Linear (uncompressed) audio capable.
- Maximum mono audio streams (play plus record) at 48 kHz that can be managed by a single NCX:
- Three PCM (16 bits) or 12 MPEG Layer II (128 kbps)
- System capacity is computed by calculating the bandwidth requirements of the total number of audio streams. As the NCX is an evolving product, please contact Digigram for the latest information.

Available models
- **NCX200** Dual channel (or stereo) playback
- **NCX400** Four channel (or dual stereo) playback
- **NCX040** Four channel (or dual stereo) record
- **NCX220** Dual channel (or stereo) playback with simultaneous and independent dual channel (or stereo) record

For more than a decade, Digigram has been an acknowledged leader in developing PC-based professional digital audio solutions. The latest digital signal processing advances are harnessed in Digigram's range of digital audio hardware, drivers and software. Provided as computer sound cards, custom hardware formats and software development environments for scores of development partners, Digigram's tools empower users to manage audio for production, editing, video post, archiving and transmission. The parent company, headquartered in Montbonnot, France, is publicly traded on the Paris stock exchange.

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