AMX-1841

Description

The AMX-1841 is a high-quality embedder which embeds up to four AES 24-bit 48kHz digital audio signals into a single SMPTE 292M HD serial digital video signal. It includes audio and video signal presence detection and reporting, and local or remote configuration and control. A unique feature is its ability to embed time code, a serial RS-422 data signal and two GPI status signals into the video signal. The card has built-in audio tone, time code and video color bar test signals.

The AMX-1841 is designed for use in the DENSITÉ frame, with the appropriate double-width rear panel.

Video - Features

- Serial HD-SDI input with automatic equalization for up to 110m of cable.
- Automatic detection of video input format
- Automatic detection of input video loss and switchover to local black for continuity of embedded audio.

Audio - Features

- AES inputs: either 110 Ω balanced or 75 Ω unbalanced, depending on rear panel in use

- Sample rate conversion for non-synchronous AES audio inputs
- Audio groups insertion/pass-through/delete
- Selectable audio delay of up to 3 frames in ½ frame steps
- Left/Right channels swappable for each AES inputs
- Automatic mute on AES error
- Selectable routing of AES signals to audio groups
- Dolby-E compatible (48kHz synchronous)
- Cards cascadeable to embed 4 full groups (16 channels)
- 24-bit digital audio embedding
- Monitor selector for Densité frame monitor switcher (MSB)
- Universal reference signal output for audio DAC

Embedding Other Signals - Features

- Linear Time Code (LTC) embedding as Ancillary Time Code (ATC) and/or sampled and embedded as ANC
- Sampling of RS-422 serial data input for embedding as ANC data.
- Sampling of two GPI inputs for embedding as ANC data.

FUNCTIONAL BLOCK DIAGRAM
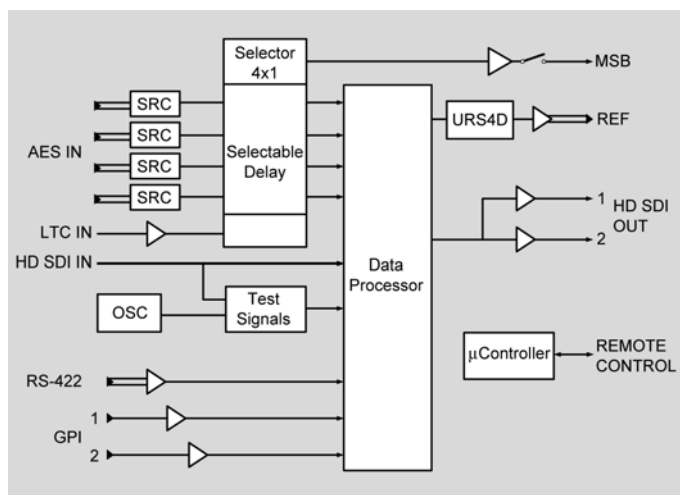
SPECIFICATIONS

VIDEO INPUT

Video Signal:	HD-SDI SMPTE 292M (1.485 Gbps) (see list of supported formats below)
Cable Length:	up to 110m of Belden 1694A
Return Loss:	>15 dB, 5 MHz to 1.485 GHz

AUDIO AES-3id INPUT

Signal:	AES-3id (SMPTE 276M)
Level:	0.2 to 2.0 Vp-p
Impedance:	75 Ω unbalanced
Cable length:	>400 m

AUDIO AES3 INPUT

Signal:	AES3
Level:	0.2 to 7.0 Vp-p
Impedance:	110 Ω balanced
Cable length	>200 m

AUDIO AES SIGNALS

Sampling Rate:	48kHz synchronous or asynchronous
Dolby-E Rate:	48kHz synchronous
Bits:	24-bit

SPECIFICATIONS(cont'd)

LTC SIGNAL

Signal:	LTC per SMPTE 12M
Rate:	1/10 to 3x nominal LTC play speed
Impedance:	< 10kΩ (bridging 600Ω) unbalanced
Level:	0.2 to 5Vp-p

VIDEO OUTPUT

Video Signal:	HD-SDI SMPTE 292M
	Audio embedding per SMPTE 299M
	LTC embedded as ATC per RP188
	LTC, RS-422 and two GPIs sampled
	And embedded as ANC data per
	SMPTE 291M (Proprietary type 1 DID)
Return Loss:	>15 dB up to 1.485 GHz
Wideband Jitter:	< 0.2 UI p-p

ANC SERIAL DATA INPUT

Signal:	RS-422
Level:	200 mVpp (min)
Rate:	DC to 38.400 bauds

ANC GENERAL PURPOSE INTERFACE (GPI) OUTPUT

|	
Signal (2):	Contact closure (opto-isolated), common ground
Level:	True = 0 to 0.8 V (max.)
	Maximum input voltage = ±5.5 V
Rate:	DC to 250 kHz

PROCESSING PERFORMANCE

Signal Path:	10-bit video / 24 bit audio
Video Delay:	11.2 μs
Audio Processing Delay:	650 μs audio insertion delay (combined embedding and extraction ‡‡)
Audio Delay:	Up to 3 video frames (1/2 frame steps)
LTC Delay:	Up to 3 video frames (one frame steps)
RS-422/GPI Processing delay:	4 video lines
Test Signals:	Video - color bars 100%
	Audio - 1 kHz tone (R steady, L pulsed) -18dBFS (EBU R49, R68)
	ATC – 10 second loop starting at 23:59:00:00
Power:	7.5 W

Note ‡‡: Applicable to combinations of this card and ADX-1841/1851, ADX-1121/1141 and ADX-102i/104i/108i.

List of supported formats:

1920 x 1080/59.94/I	1280 x 720/59.94/P
1920 x 1080/50/I	1280 x 720/50/P
1920 x 1080/29.97/P	
1920 x 1080/25/P	
1920 x 1080/24/P	
1920 x 1080/23.98/P	
1920 x 1080/29.97/PsF	
(detected as 1920 x 1080/59.94/I)	
1920 x 1080/25/PsF	
(detected as 1920 x 1080/50/I)	
1920 x 1080/24/PsF	
1920 x 1080/23.98/PsF	

AMX-1841

SELECT button

Status LED
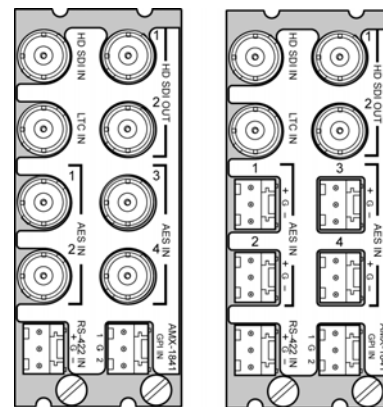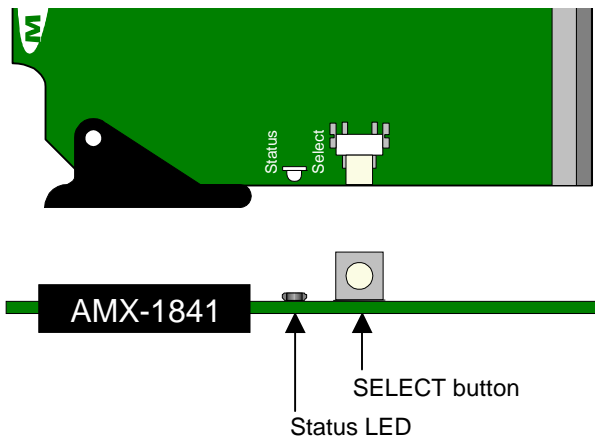
AMX-1841-75-DRP
AES-3id

AMX-1841-110-DRP
AES3

AMX-1841 Rear Connector Panels

INSTALLATION

Make sure the following items have been shipped with your AMX-1841. If any of the following items are missing, contact your distributor or Miranda Technologies Inc.

* AMX-1841 Digital Audio Embedder
* AMX-1841 rear panel (see figure for options)

The AMX-1841and its associated rear connector panel must be mounted in a DENSITÉ frame. It is not necessary to switch off the frame's power when installing or removing the AMX-1841. See the DENSITÉ Frame manual for detailed instructions for installing cards and their associated rear panels.

The AMX-1841 has multiple audio and video inputs and outputs, and making space for all the necessary connectors at the rear of the frame requires a double-width rear panel.

When a double–width rear panel has been installed, the AMX-1841 must be installed in the right-most of the two slots covered by the panel in order to mate with the panel's connectors. If it is placed in the wrong slot, the front panel LED will flash red. Move the card to other slot for correct operation. No damage will result to the card should this occur.

OPERATION

Overview

The DENSITÉ frame incorporates a central controller card, located in the center of the frame, which is equipped with an LCD display and a control panel. The controller handles error reporting and local and remote control for all cards installed in the frame. The display and control panel are assigned to the card in the frame whose SELECT button has been pushed.

Status Monitor LED

The status monitor LED is located on the front card-edge of the AMX-1841module, and is visible through the front access door of the DENSITÉ frame. This multi-color LED indicates module status by color, and by flashing/steady illumination, according to the following chart (which also indicates fault reporting for this card on the DENSITÉ frame's serial and GPI interfaces).

	REPORT		COLOR (F=flashing)			
	SERIAL	GPI	G	Y	R	FR
No errors			✪			
No signal	✪				✪	
No rear						✪
Test mode				✪		

✪ : Factory default.   ▨ User configurable

A "Flashing Yellow" Status LED indicates that the SELECT button on the front panel has been pushed, and the controller display and control panel are now assigned to this card. The LED color assignments for some error conditions can be reconfigured by the user (see the chart and menu for details).

User Interface

Pushing the SELECT button will cause the on-card STATUS LED to flash yellow, and the card identification and the current status will be shown on the controller card's display. The STATUS LED will revert to it's normal state upon a second push of the button, or after a short delay. The messages which may appear are shown in the top line of the menu chart on page 3

Example :

SELECT button pushed twice when there is no input signal connected to the rear panel and the LED is steady red:

A	M	X	-	1	8	4	1								
N	O		S	I	G	N	A	L							

Use the local control panel to access the detailed status report shown in the STATUS menu on page 3.
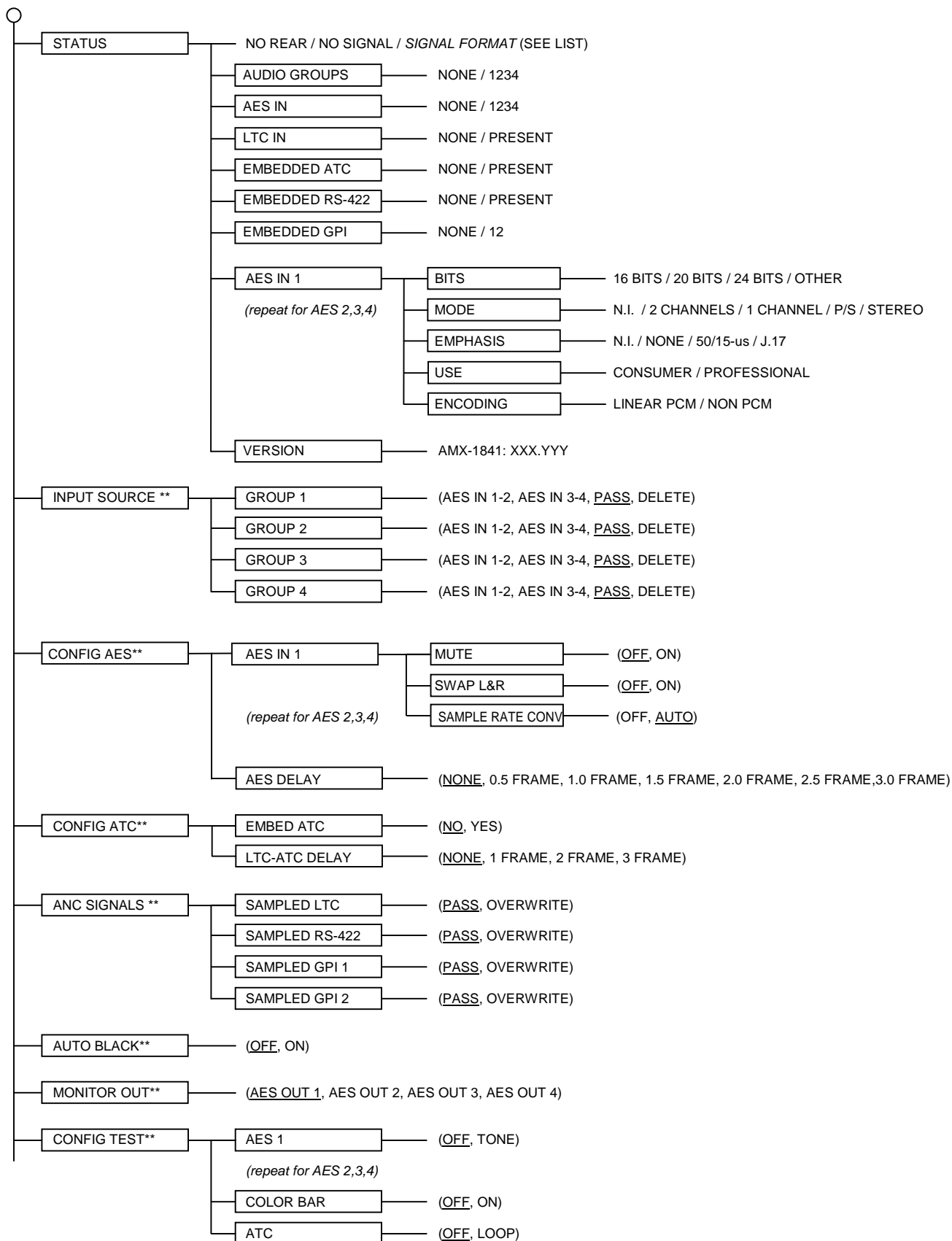
Operating Parameter Adjustment

The AMX-1841has operating parameters which may be adjusted at the controller card interface. After pressing the SELECT button on the AMX-1841card, use the keys on the local control panel (described in the Controller card manual) to step through the displayed menu and adjust the parameters. The menus are shown below.
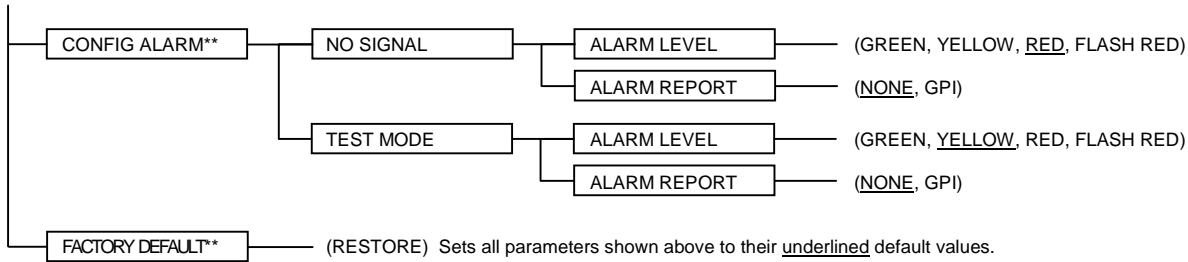
AMX-1841 Menu

STATUS — NO REAR / NO SIGNAL / *SIGNAL FORMAT* (SEE LIST)

- AUDIO GROUPS — NONE / 1234
- AES IN — NONE / 1234
- LTC IN — NONE / PRESENT
- EMBEDDED ATC — NONE / PRESENT
- EMBEDDED RS-422 — NONE / PRESENT
- EMBEDDED GPI — NONE / 12

- AES IN 1 *(repeat for AES 2,3,4)*
  - BITS — 16 BITS / 20 BITS / 24 BITS / OTHER
  - MODE — N.I. / 2 CHANNELS / 1 CHANNEL / P/S / STEREO
  - EMPHASIS — N.I. / NONE / 50/15-us / J.17
  - USE — CONSUMER / PROFESSIONAL
  - ENCODING — LINEAR PCM / NON PCM

- VERSION — AMX-1841: XXX.YYY

INPUT SOURCE **

- GROUP 1 — (AES IN 1-2, AES IN 3-4, PASS, DELETE)
- GROUP 2 — (AES IN 1-2, AES IN 3-4, PASS, DELETE)
- GROUP 3 — (AES IN 1-2, AES IN 3-4, PASS, DELETE)
- GROUP 4 — (AES IN 1-2, AES IN 3-4, PASS, DELETE)

CONFIG AES**

- AES IN 1 *(repeat for AES 2,3,4)*
  - MUTE — (OFF, ON)
  - SWAP L&R — (OFF, ON)
  - SAMPLE RATE CONV — (OFF, AUTO)
- AES DELAY — (NONE, 0.5 FRAME, 1.0 FRAME, 1.5 FRAME, 2.0 FRAME, 2.5 FRAME, 3.0 FRAME)

CONFIG ATC**

- EMBED ATC — (NO, YES)
- LTC-ATC DELAY — (NONE, 1 FRAME, 2 FRAME, 3 FRAME)

ANC SIGNALS **

- SAMPLED LTC — (PASS, OVERWRITE)
- SAMPLED RS-422 — (PASS, OVERWRITE)
- SAMPLED GPI 1 — (PASS, OVERWRITE)
- SAMPLED GPI 2 — (PASS, OVERWRITE)

AUTO BLACK** — (OFF, ON)

MONITOR OUT** — (AES OUT 1, AES OUT 2, AES OUT 3, AES OUT 4)

CONFIG TEST**

- AES 1 — (OFF, TONE) *(repeat for AES 2,3,4)*
- COLOR BAR — (OFF, ON)
- ATC — (OFF, LOOP)

...menu cont'd

CONFIG ALARM**	NO SIGNAL	ALARM LEVEL	(GREEN, YELLOW, <u>RED</u>, FLASH RED)
		ALARM REPORT	(<u>NONE</u>, GPI)
	TEST MODE	ALARM LEVEL	(GREEN, <u>YELLOW</u>, RED, FLASH RED)
		ALARM REPORT	(<u>NONE</u>, GPI)
FACTORY DEFAULT**	(RESTORE) Sets all parameters shown above to their <u>underlined</u> default values.		

***Press **Select** pushbutton to activate selection*

INPUT SOURCE menu

GROUP1, GROUP2, GROUP3, GROUP4: Selects the source of audio for the four embedded audio groups. AES IN 1-2 and AES IN 3-4 select audio from the AMX-1841 inputs. PASS leaves the incoming embedded audio group intact, passing it through to the HD-SDI output. DEL deletes the incoming embedded audio groups, leaving the HD-SDI output without embedded audio. Sample rate converters permit the AES inputs to be synchronous or asynchronous.

Note: The standard for embedded audio specifies 48kHz sampling, synchronous to video. Sample rate converters permit the input of asynchronous linear PCM audio; however, AES signals containing non-PCM audio must be synchronous 48kHz. Asynchronous inputs will affect the integrity of channel status and user data, causing error flags to be set that may be detected by downstream equipment.

CONFIG AES menu

AES IN 1, 2, 3, 4: Select *MUTE:* ON or OFF, *SWAP L&R*: ON or OFF, or *SAMPLE RATE CONV*: OFF or AUTO for each of the four AES channels. In AUTO mode the non-pcm channel status bit will automatically turn off the sample rate conversion process.

DELAY: set the delay of the AES signal as it passes through the embedder, to NONE or a number of video fields from 1 to 6.

CONFIG ATC menu

EMBED: Permits the user to embed ATC, translated from the input LTC, into the incoming HD-SDI signal.

DELAY: LTC to ATC delay selectable between NONE and a number of video frames (1 to 3).

ANC SIGNALS menu

SAMPLED LTC: The incoming LTC data is sampled and may be embedded as ANC data. Select PASS to leave any already embedded LTC data untouched (no insertion) or OVERWRITE, which embed incoming LTC data to HD-SDI signal while any existing embedded LTC data is removed.

SAMPLED RS-422: The incoming RS-422 serial data is sampled and may be embedded as ANC data. Select PASS to leave any already embedded RS-422 data untouched (no insertion) or OVERWRITE, which embed incoming RS-422 data to HD-SDI signal while any existing embedded RS-422 data is removed.

SAMPLED GPI 1, 2: The incoming GPI status data is sampled and may be embedded as ANC data. Select PASS to leave any already embedded GPI data untouched (no insertion) or OVERWRITE, which embed incoming GPI data to HD-SDI signal while any existing embedded GPI data is removed.

AUTO BLACK menu

Turn *AUTO BLACK* ON or OFF. Auto Black replaces the input video with a locally-generated video black in the event of an input failure, to maintain audio embedding.

CONFIG TEST menu

AES IN 1, 2, 3, 4: User can enable (TONE) or disable (OFF) a test tone (1 KHz, R-steady, L-pulsed, at –18dBFS) on each of the four AES channels individually.

COLOR BAR: User can enable (ON) or disable (OFF) color bars on the video output.

ATC: User can enable a test loop (10 seconds loop starting at 23:59:00:00) that is inserted into the embedded ATC.

CONFIG ALARM menu

The user can configure the status LED presentation (ALARM LEVEL) and fault reporting (NONE or GPI) for some of the fault conditions of the AMX-1841. Those not listed here are factory-set and cannot be user-modified.

NO SIGNAL: Errors include no signal attached to the card input, or faulty incoming HD-SDI signal.

TEST MODE: Indicates whether test signals are present on any of the AMX-1841 outputs (audio or video).

FACTORY DEFAULT menu

Select *RESTORE* to reset all of the menu-adjustable parameters to a factory-preset state (indicated in the menu by an <u>underline</u> in the list of available choices).

WARRANTIES

Miranda's Warranty and Warranty Policy are explained in full detail in the Warranty Information Sheet.

COMPLIANCE

Radio Frequency Interference and Immunity

This unit generates, uses, and can radiate radio frequency energy. If the unit is not properly installed and used in accordance with this guide, it may cause interference with radio communications. Operation with non-certified peripheral devices is likely to result in interference with radio and television reception. This equipment has been tested and complies with the limits in accordance with the specifications in:

FCC Part 15, Subpart B;   CE EN50081-1:1992;   CE EN50082-1:1992.

CONTACT MIRANDA

Head Office	*Miranda Europe*	*Miranda Asia*
Miranda Technologies Inc. 3499 Douglas-B.-Floreani St. Laurent (Montreal), Que. H4S 1Y6 Canada	222, 226 Rue De Rosny 93100 Montreuil France	Mita Nexus Bldg. 2F 1-3-33 Mita, Minato-Ku Tokyo, Japan 108-0073

Tel	+1 (514) 333-1772	+33 1 55 86 87 88	+81 3 5730 2988
Fax	+1 (514) 333-6914	+33 1 55 86 00 29	+81 3 5730 2973
Toll free:	1-800-224-9828		