R20CE

**10-bit Encoder
R-series Card Module**

Installation and Operation Guide

B e c a u s e   i t   m a t t e r s .

AJA
VIDEO SYSTEMS

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Notice

Contacting Support

To contact AJA Video for sales or support, use any of the following methods:

180 Litton Drive, Grass Valley, CA. 95945 USA

Telephone: 800.251.4224 or 530.274.2048
Fax: 530.274.9442

Web: http://www.aja.com
Support Email: support@aja.com
Sales Email: sales@aja.com

When calling for support, have all information at hand prior to calling.
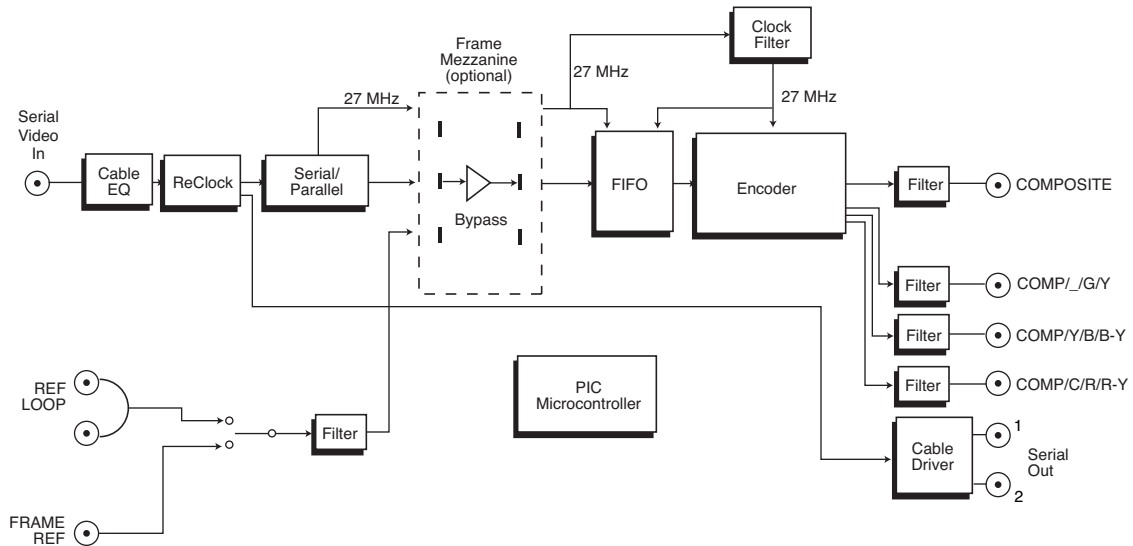
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AJA Video warrants that this product will be free from defects in materials and workmanship for a period of five years from the date of purchase. If a product proves to be defective during this warranty period, AJA Video, at its option, will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, you the Customer, must notify AJA Video of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Customer shall be responsible for packaging and shipping the defective product to a designated service center nominated by AJA Video, with shipping charges prepaid. AJA Video shall pay for the return of the product to the Customer if the shipment is to a location within the country in which the AJA Video service center is located. Customer shall be responsible for paying all shipping charges, insurance, duties, taxes, and any other charges for products returned to any other locations.

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Introduction

The AJA Video R20CE SDI to Analog Video Encoder produces high quality NTSC or PAL 10-bit encoded video from SMPTE 259M SDI inputs. Three additional analog outputs can be configured as duplicates of the composite output, or used for component output. When configured for component video, the R20CE can output Y/C (S-Video), YPbPr (SMPTE, EBU-N10), Betacam, or RGB.

The R20CE also serves as an SDI distribution amplifier, providing 2 re-clocked outputs of the SDI input source. The R20CE is compatible with the AJA FR1 1RU 4 slot frame or the FR2 2RU 10 slot frame.

The component and composite outputs incorporate optimum chroma filtering and independent pedestal configuration. The R20CE also features an exclusive PLL jitter filter/memory to reduce the effects of SDI jitter on the output analog video. This feature, along with the precision 4x oversampled D/A filters, provides high quality analog outputs, with very low phase noise in the composite outputs.

The optional AJA model FSG (Frame Sync/Genlock) Module allows genlock to an external reference with full timing adjustment. Without the FSG Module, the reference input provides color frame timing.

Features

R20CE Card Module, Side View

- High quality 10-bit encoding, 4 times oversampling
- SDI Input, SMPTE 259M
- Two SDI outputs (SMPTE 259M) (equalized and re-clocked copies of the SDI input)
- Four analog outputs (configurable as 4 composite, or 1 composite and R/G/B, Y/Pb/Pr, or Y/C)
- Y/Pb/Pr selectable for SMPTE/EBU levels or Betacam levels (Y, R-Y, B-Y)
- Automatic NTSC/PAL selection
- Configurable pedestal and narrow/wide H/V blanking
- Frame Sync/Genlock option with reference input and full timing adjustment~
- Locks composite output Color Framing sequence to external reference without Frame Sync/Genlock option,.
- Plug compatible with several other manufacturers' video frames
- Compatible with Leitch 6800 Series Frames

Block Diagram

R20CE 10-bit Encoder, Block Diagram

I/O Connections

FR1 and FR2 BNC Connector Assignments, R20CE Card Module

When the R20CE module is installed in an AJA FR1 or FR2 frame, a corresponding group of 9 BNCs on the rear panel then provide I/O for the module. The illustration above shows the connector assignments for both the FR1 and FR2 when used with the R20CE.

Note: See the topic "*External Reference Information*" later in this manual for information on use of the *Ref Loop* BNCs versus the FR1/FR2 frame reference BNC when connecting an external reference video signal.

User Controls

Rotary
Switch
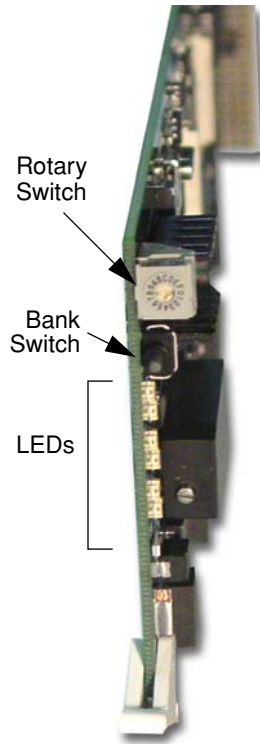
Bank
Switch

LEDs

The user interface for the R20CE includes a 16 position hex rotary switch, a momentary action up/down toggle switch, and 6 LEDs. Use the rotary switch to select a function and then adjust the function using the toggle switch. The BANK Led allows two banks of functions to be accessed, The LEDs are numbered 1-6 from top to bottom. The LEDs are labeled as follows:

LED	FUNCTION
1	BANK (OFF=Bank O ON=Bank 1)
2	525
3	AUTO (auto 525/625 select)
4	625
5	VID (video detected at input)
6	CONFIRM (for signaling memory load, errors, etc.)

Control Functions The following tables describe the functions controlled by the rotary switch and toggle switch user interface. To access a particular function, set the hex rotary switch to the appropriate function, and then adjust the function by flipping the toggle switch. For ON/OFF-type functions, such as Setup/NoSetup selection, moving the toggle switch to the UP/LEFT position sets the function and moving the switch DOWN/RIGHT clears the function. Using the toggle with multi-value functions, such as INPUT MODE, rotates through all the possible choices for the function. To control variables, such as framesync delay, the value of the function will be incremented or decremented each time the switch is momentarily moved either up, or down respectively. Holding the switch in either position will cause the function to automatically begin incrementing or decrementing—after a two second pause. On functions having more than two selections, using the toggle switch cycles through the available selections.

Bank 0 Functions

FUNCTION	DESCRIPTION	DETAILS
0	BANK SEL	ToggleUP/LEFT to select BANK 1 Toggle DOWN/RIGHT to select BANK 0
1	|NPUT MODE	0 = Auto Select 1 = 525 2 = 625
2	VBLANK	UP/LEFT = Narrow DOWN/RIG HT = Wide
3	SETUP	UP/LEFT = No Pedestal DOWN/RIGHT=AddPedestal
4	OUTPUT MODE	0 = Composite on all 1 = Y,Pb,Pr 2 = RGB 3 = Y/C
5	COMPONENT LEVELS	UP/LEFT = BETACAM 525 (Y, R-Y,B-Y) DOWN/RIGI[T = SMPTE EBU N-10/ BETACAM 625 (Y,Pb,Pr) (When OUTPUT MODE = Y,Pb,Pr)
6	INPUT SOURCE	Toggle DOWN to pass video. Toggle UP for Bars (Internal test signal)
7	<reserved>	
8	CLEAR USER SETUP	Toggle either way to clear User EEPROM and reset board
9	RESET	Toggle either way to reset board
A	<reserved>	
B	<reserved>	
C	<reserved>	
D	<reserved>	
E	STORE/RECALL	Toggle UP to store register Toggle DOWN to recall register
F	RESTORE DEFAULTS	Toggle either way to restore default settings

Bank 1 (Frame Sync Option Only)

FUNCTION	DESCRIPTION	DETAILS
0	BANK SEL	Toggle UP/LEFT to select BANK I Toggle DOWN/RIGHT to select BANK 0
|	SET DEFAULT DELAY	Toggle UP/LEFT or DOWN/RIGHT = Restores FSC to factory defaults
2	SET LINE DELAY	Toggle UP/LEFT = increases OutputDelay by lines Toggle DOWN/RIGHT = Decreases Output Delay by lines
3	SET PIXEL DELAY	Toggle UP/LEFT = increases Output Delay by pixels Toggle DOWN/RIGHT = Decreases Output Delay by pixels
4	<reserved>	
5	<reserved>	
6	<reserved>	
7	<reserved>	
8	<reserved>	
9	<reserved>	
A	<reserved>	
B	<reserved>	
C	<reserved>	
D	<reserved>	
E	STORE/RECALL USER CONFIGURATION	Toggle UP/LEFT to Store Register Toggle DOWN/RIGHT to Recall Register
F	RESTORE DEFAULTS	Toggle UP/LEFT or DOWN/RIGHT to Restore Default Settings

Installation

Typically, R20CE installation consists of the following:

1. disconnect power from the frame (remove line cord)
2. remove the FR1/FR2 front panel
3. install R20CE card module
4. apply external color black reference at the frame's External Reference BNC
5. replace the FR1/FR2 front panel
6. apply power to the frame by connecting a north american-style power cord from the frame to mains power (90 to 260 VAC)

Warning!

Ensure Mains Power is disconnected before installing the FR1 or FR2 frame R-series modules into the frame, or installing and removing options. If a Mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible.

Warning!

FR2 Dual Power Cord Notice—please read this. To reduce the risk of electrical shock, disconnect both power cords before servicing equipment.

Caution!

The FR1/FR2 front fan door is heavy and is not hinged. Remove with Caution.

Instructions for removing the frame front door for module installation is discussed in the *FR1/FR2 User Manual.*

External Reference Information

The R20CE expects the External Reference to be an NTSC or PAL analog Color Black signal. The External Reference input can come from two different sources on the R20CE. There are jumpers on the R20CE (see figure below) for selecting the external reference source and for optionally terminating the selected reference source.
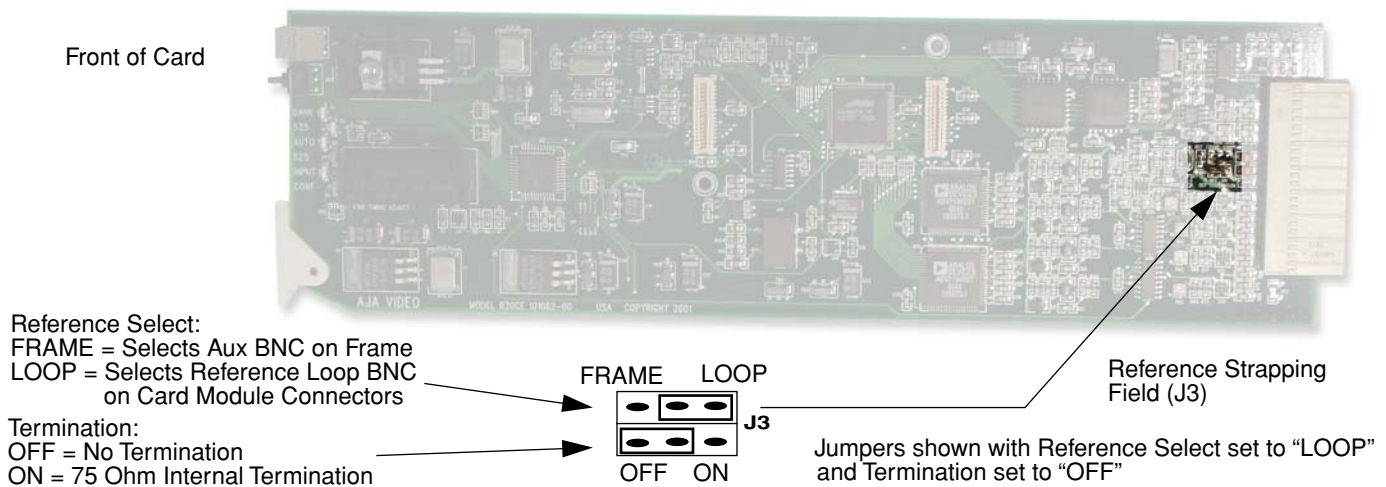
Looping Reference

The R20CE cell group of 9 BNCs contains two BNCs that can be used for a looping reference connection. If this method is used, then the reference select setting on the R20CE should be set to "LOOP" and the TERMINATION setting should be set to "OFF" (no termination). Optionally, if you're using only one of the looping reference BNCs, then the TERMINATION setting should be set to "ON."

Frame Reference

Alternatively, the R20CE installed in a FR1 or FR2 frame can use the frame's *frame reference input* BNC connector, which feeds an external reference video signal to all modules installed in the frame. How the signal is distributed differs for the FR1 and FR2 frames. Additionally, individual modules can usually be strapped as to whether external reference is distributed from the frame or directly to BNCs on the module's corresponding cell group (the 9 BNCs on the rear panel).

FR1 Frame: the external reference signal is distributed passively to all frame modules. If you wish to use the frame reference, the R20CE should have "FRAME" reference selected on the module strapping, and one and only one card in the frame should have "TERMINATION" set to "ON." All other cards in the frame should have TERMINATION set to "OFF."

FR2 Frame: the external reference signal is distributed by an in-frame distribution amplifier to all frame modules. This system terminates the Frame Reference input BNC and buffers the signal to all slots. If using frame reference, the R20CE installed in the FR2 frame should have "FRAME" set for reference select, and all cards should have TERMINATION set to "OFF."

Front of Card

Reference Select:
FRAME = Selects Aux BNC on Frame
LOOP = Selects Reference Loop BNC
        on Card Module Connectors

Termination:
OFF = No Termination
ON = 75 Ohm Internal Termination

FRAME   LOOP

J3

OFF   ON

Reference Strapping Field (J3)

Jumpers shown with Reference Select set to "LOOP" and Termination set to "OFF"

Reference Select and Termination Configuration

Output Timing Adjustment (With Model FSG Framesync/ Genlock Option

The following procedure provides instructions for output timing adjustment of the R20CE when used with the model FSG FRAMESYNC/GENLOCK option.

The R20CE has three levels of output timing adjustment:

- advance or delay by lines
- advance or delay by pixels (with l/4 pixel resolution)
- fine timing adjust (+/- 40 nanoseconds)

There are two modes of timing adjustment:

- Genlock
- Delay

If the R20CE detects an external reference, it then enters Genlock mode. If no external reference is detected, the board enters Delay mode. In Genlock mode, the R20CE output genlocks to the external reference. The board can be set to Delay mode without removing the external reference by lifting the "REFERENCE SELECT" jumper (J3).

Genlock Mode

1. Perform function 1 in Bank 1 "*SET DEFAULT DELAY.*" This brings the output timing close to the reference's timing.
2. Perform function 3 in Bank 1 "*SET PIXEL DELAY.*" This will allow adjustment to within l/4 pixel of reference.
3. Adjust the "*FINE TIMING ADJUST*" control on the front of the R20CE board for precise exact timing (refer to photo provided).

Delay Mode

1. Perform function 1 in Bank 1 "*SET DEFAULT DELAY.*" This action sets the total delay through the R20CE to about 1 frame.,

2. Perform function 2 in Bank 1 "*SET LINE DELAY.*" This allows you to advance and delay the output timing in line increments.

3. Perform function 3 in Bank 1 "*SET PIXEL DELAY.*" This allows you to advance and delay the output timing in Pixel increments.

Note: In "*SET PIXEL DELAY,*" the first four increments are 1/4 pixel steps.

4. Adjust timing as desired anywhere between the steps set above by adjusting the "*FINE TIMING ADJUST*" control on the front of the R20CE board.

Fine Timing Adjustment
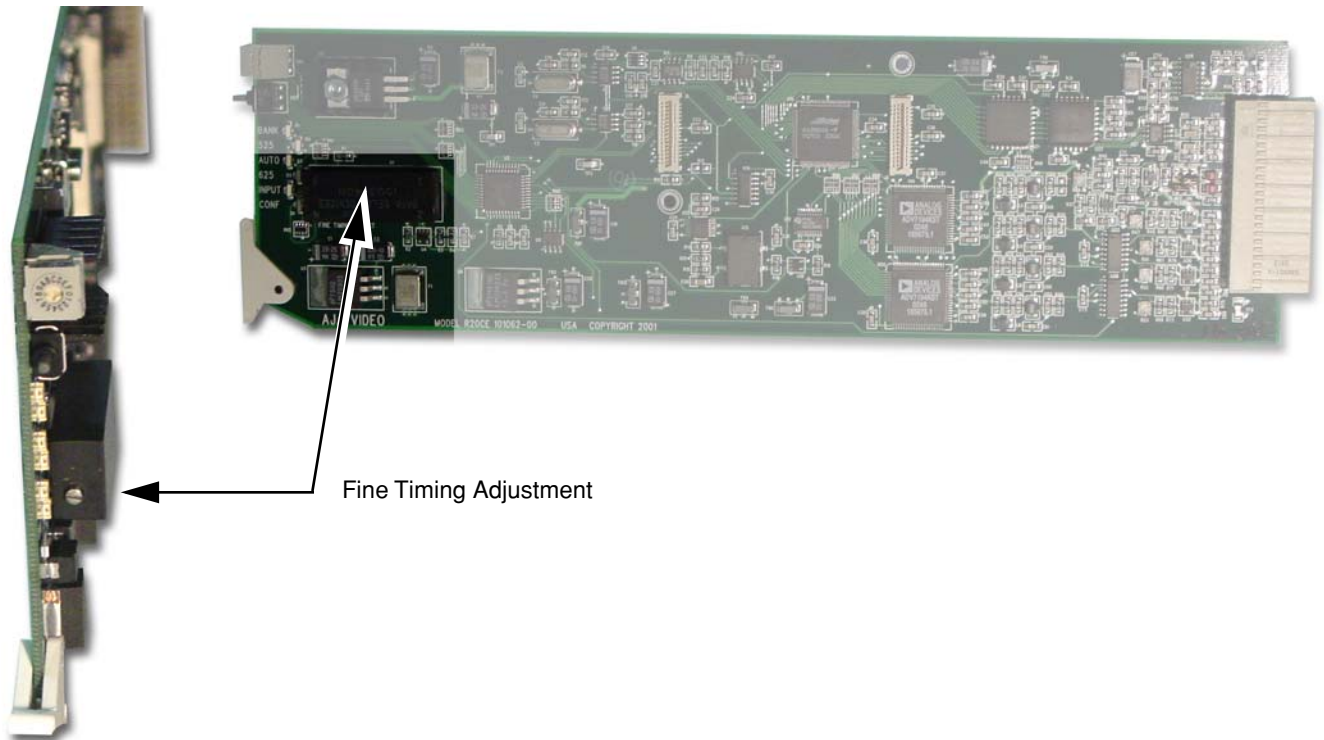
R20CE Fine Timing Adjustment Control Location

Specifications

Item	Specification
Input Format:	SMPTE 259 / ITU-R-601 Serial Digital Component
Primary Output Format:	NTSC, PAL, Y/C (S Video)
Active Looping Output:	SMPTE 259 / ITU-R-601 Serial Digital Component
Reference Input Format:	NTSC or PAL Analog Color Black
SDI Cable Equalization:	300 meter 8281 typical
Serial Output:	Equalized, Re-clocked
Return Loss:	Serial Input:15 dB to 300MHz, Serial Output:15 dB to 300MHz
FrequencyResponse:	+/- 0.25dB to 5.5MHz (Y) +/- 0.25dB to 2.0Mhz (Chroma - Component, RGB) +/- 0.25dB to 1.3Mhz (Chroma - Composite)
2T K factor:	<1% (Y)
Diff. Gain:	<1.5%
Diff. Phase:	<1.5 degree
Y/C delay:	l0 ns max
D/A Converters:	10 bits
Signal Path:	l0 bits
Delay (input to output):	6.2 microseconds (without Framesync option installed)
Output level matching:	1.5% or l0mv (All outputs are separately buffered)
Output level adjustment:	+/-20% (internal)
Power Consumption:	6.0 W (w/o FSG Framesync) 7.5 W (w/ FSG Framesync)

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Appendix A: Safety & Compliance

Federal Communications Commission (FCC) Compliance Notices

Class A Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian ICES Statement

Canadian Department of Communications Radio Interference Regulations

This digital apparatus does not exceed the Class A limits for radio-noise emissions from a digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications. This Class A digital apparatus complies with Canadian ICES-003.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

European Union and European Free Trade Association (EFTA) Regulatory Compliance

This equipment may be operated in the countries that comprise the member countries of the European Union and the European Free Trade Association. These countries, listed in the following paragraph, are referred to as The European Community throughout this document:

AUSTRIA, BELGIUM, BULGARIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, NETHERLANDS, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, UNITED KINGDOM, ICELAND, LICHTENSTEIN, NORWAY, SWITZERLAND

Declaration of Conformity

Marking by this symbol indicates compliance with the Essential Requirements of the EMC Directive of the European Union 2004/108/EC.

This equipment meets the following conformance standards:

Safety:

CB- IEC 60065:2001 + A1:2005

NRTL - UL 60065:2003 R11.06, CSA C22.2 NO. 60065:2003 + A1:06

GS - EN 60065:2002 + A1

Additional licenses issued for specific countries available on request.

Emissions:

EN 55103-1: 1996

EN61000-3-2:2006, EN61000-3-3:1995 +A1:2001 +A2:2005

Immunity:

EN 55103-2: 1996

EN61000-4-2:1995 + A1:1999 + A2:2001, EN61000-4-3:2006, EN61000-4-4:2004,

EN 61000-4-5: 2005, EN 610004-6:2007, EN61000-4-11:2004

The product is also licensed for additional country specific standards as required for the International Marketplace.

Warning!

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

Achtung! Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention! Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

Korea KCC Compliance Statement

1) Class A ITE

A급 기기 (업무용 방송통신기기)	이 기기는 업무용 (A급) 으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

1) Class A device

Class A (Broadcasting and Communication Equipment for Business Use)	Please note that this equipment has obtained EMC registration for business use (Class A), and it is intended to use in other than home area.

Taiwan Compliance Statement

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻
干擾，在這種情況下，使用者會被要求採取某些適當的對策。

This is a Class A product based on the standard of the Bureau of Standards, Metrology and Inspection (BSMI) CNS 13438, Class A.

Japanese Compliance Statement

1. Class A ITE

この装置は、クラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害

を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求され

ることがあります。ＶＣＣＩ－Ａ

This is a Class A product based on the standard of the VCCI Council (VCCI V-3/2008.04). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

Translated caution statements, warning conventions and warning messages

The following caution statements, warning conventions, and warning messages apply to this product and manual.

Warning Symbol   Caution Symbol

Before operating your unit, please read the instructions in this document

Warning!

Read and follow all warning notices and instructions marked on the product or included in the documentation.

Avertissement ! Lisez et conformez-vous à tous les avis et instructions d'avertissement indiqués sur le produit ou dans la documentation.

Warnung! Lesen und befolgen Sie die Warnhinweise und Anweisungen, die auf dem Produkt angebracht oder in der Dokumentation enthalten sind.

¡Advertencia! Lea y siga todas las instrucciones y advertencias marcadas en el producto o incluidas en la documentación.

Aviso! Leia e siga todos os avisos e instruções assinalados no produto ou incluídos na documentação.

Avviso! Leggere e seguire tutti gli avvisi e le istruzioni presenti sul prodotto o inclusi nella documentazione.

Warning!

Do not use this device near water and clean only with a dry cloth.

Avertissement! N'utilisez pas cet appareil près de l'eau et nettoyez-le seulement avec un tissu sec..

Warnung! Das Gerät nicht in der Nähe von Wasser verwenden und nur mit einem trockenen Tuch säubern.

¡Advertencia! No utilice este dispositivo cerca del agua y límpielo solamente con un paño seco.

Aviso! Não utilize este dispositivo perto da água e limpe-o somente com um pano seco.

Avviso! Non utilizzare questo dispositivo vicino all'acqua e pulirlo soltanto con un panno asciutto.

Warning!

Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

Avertissement ! Ne bloquez aucune ouverture de ventilation. Suivez les instructions du fabricant lors de l'installation.

Warnung! Die Lüftungsöffnungen dürfen nicht blockiert werden. Nur gemäß den Anweisungen des Herstellers installieren.

¡Advertencia! No bloquee ninguna de las aberturas de la ventilación. Instale de acuerdo con las instrucciones del fabricante.

Aviso! Não obstrua nenhuma das aberturas de ventilação. Instale de acordo com as instruções do fabricante.

Avviso! Non ostruire le aperture di ventilazione. Installare in conformità con le istruzioni del fornitore.

Warning!

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

Avertissement ! N'installez pas l'appareil près d'une source de chaleur telle que des radiateurs, des bouches d'air de chauffage, des fourneaux ou d'autres appareils (amplificateurs compris) qui produisent de la chaleur.

Warnung! Nicht in der Nähe von Wärmequellen wie Heizkörpern, Heizregistern, Öfen oder anderen Wärme erzeugenden Geräten (einschließlich Verstärkern) aufstellen.

¡Advertencia! No instale cerca de fuentes de calor tales como radiadores, registros de calor, estufas u otros aparatos (incluidos amplificadores) que generan calor.

Aviso! Não instale perto de nenhuma fonte de calor tal como radiadores, saídas de calor, fogões ou outros aparelhos (incluindo amplificadores) que produzam calor.

Avviso! Non installare vicino a fonti di calore come termosifoni, diffusori di aria calda, stufe o altri apparecchi (amplificatori compresi) che emettono calore.

Warning!

Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any wav, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device, the device has been exposed to rain or moisture, does not operate normally, or has been dropped.

Avertissement ! Référez-vous au personnel de service qualifié pour tout entretien. L'entretien est exigé quand l'appareil a été endommagé de quelque manière que ce soit, par exemple lorsque le cordon d'alimentation ou la prise sont endommagés, que du liquide a été versé ou des objets sont tombés dans l'appareil, que l'appareil a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement ou est tombé.

Warnung! Das Gerät sollte nur von qualifizierten Fachkräften gewartet werden. Eine Wartung ist fällig, wenn das Gerät in irgendeiner Weise beschädigt wurde, wie bei beschädigtem Netzkabel oder Netzstecker, falls Flüssigkeiten oder Objekte in das Gerät gelangen, das Gerät Regen oder Feuchtigkeit ausgesetzt wurde, nicht ordnungsgemäß funktioniert oder fallen gelassen wurde.

¡Advertencia! Consulte al personal calificado por cuestiones de reparación. El servicio de reparación se requiere cuando el dispositivo ha recibido cualquier tipo de daño, por ejemplo cable o espigas dañadas, se ha derramado líquido o se han caído objetos dentro del dispositivo, el dispositivo ha sido expuesto a la lluvia o humedad, o no funciona de modo normal, o se ha caído.

Aviso! Remeta todos os serviços de manutenção para o pessoal de assistência qualificado. A prestação de serviços de manutenção é exigida quando o dispositivo foi danificado mediante qualquer forma, como um cabo de alimentação ou ficha que se encontra danificado/a, quando foi derramado líquido ou caíram objectos sobre o dispositivo, quando o dispositivo foi exposto à chuva ou à humidade, quando não funciona normalmente ou quando foi deixado cair.

Avviso! Fare riferimento al personale qualificato per tutti gli interventi di assistenza. L'assistenza è necessaria quando il dispositivo è stato danneggiato in qualche modo, ad esempio se il cavo di alimentazione o la spina sono danneggiati, è stato rovesciato del liquido è stato rovesciato o qualche oggetto è caduto nel dispositivo, il dispositivo è stato esposto a pioggia o umidità, non funziona correttamente o è caduto.

Caution!

This device is a Class A product. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

Attention! Le périphérique est un produit de Classe A. Le fonctionnement de cet équipement dans une zone résidentielle risque de causer des interférences nuisibles, auquel cas l'utilisateur devra y remédier à ses propres frais.

Achtung! Dies ist ein Gerät der Klasse A. Bei Einsatz des Geräts in Wohngebieten kann es Störungen des Radio- und Fernsehempfangs verursachen. In diesem Fall muss der Benutzer alle notwendigen Maßnahmen ergreifen, die möglicherweise nötig sind, um die Störungen auf eigene Rechnung zu beheben.

¡Precaución! Este es un producto clase A. El uso de este equipo en áreas residenciales puede causar interferencias nocivas, en cuyo caso, se requerirá que los usuarios tomen cualquier medida necesaria para corregir la interferencia por cuenta propia.

Cuidado! Este dispositivo é um produto Classe A. Operar este equipamento em uma área residencial provavelmente causará interferência prejudicial; neste caso, espera-se que os usuários tomem as medidas necessárias para corrigir a interferência por sua própria conta.

Attenzione! Questo dispositivo è un prodotto di Classe A. Il funzionamento di questo apparecchio in aree residenziali potrebbe causare interferenze dannose, nel cui caso agli utenti verrà richiesto di adottare tutte le misure necessarie per porre rimedio alle interferenze a proprie spese.

Warning!

 Disconnect the external AC power supply line cord(s) from the mains power before moving the unit.

Avertissement ! Retirez le ou les cordons d'alimentation en CA de la source d'alimentation principale lorsque vous déplacez l'appareil.

Warnung! Trennen Sie die Wechselstrom-Versorgungskabel vom Netzstrom, bevor Sie das Gerät verschieben.

¡Advertencia! Cuando mueva la unidad desenchufe de la red eléctrica el/los cable(s) de la fuente de alimentación CA tipo brick.

Advertência! Remova os cabos CA de alimentação brick da rede elétrica ao mover a unidade.

Avvertenza! Scollegare il cavo dell'alimentatore quando si sposta l'unità.

Warning!

Ensure Mains Power is disconnected before installing the FR1 or FR2 frame R-series modules into the frame, or installing and removing options. If a Mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible.

Avertissement ! S'assurer que la source principale d'alimentation est débranchée avant d'installer les modules des cartes série R de boîtier FR1 ou FR2 sur l'appareil, ou avant d'installer ou de supprimer des options. Si aucun commutateur principal n'est fourni, le ou les cordons d'alimentation de cet équipement fournissent le moyen nécessaire pour le débranchement. La prise doit être installée près de l'équipement et doit être facilement accessible.

Warnung! Vor der Installation der FR1 oder FR2 Steckkartenmodule der R-Serie in den Rahmen bzw. vor der Installation oder dem Entfernen von Optionen muss sichergestellt werden, dass der Netzstrom ausgeschaltet bzw. abgetrennt ist. Wenn kein Netzschalter verfügbar ist, kann der Netzstrom mithilfe des/der Netzkabel(s) am Gerät getrennt werden. Die Steckdose muss in der Nähe des Geräts installiert und leicht zugänglich sein.

¡Advertencia! Asegúrese de que la energía de la red de electricidad esté desconectada antes de instalar el módulo de tarjeta de cuadro FR1 o FR2 serie R dentro del cuadro, o antes de instalar o desinstalar opciones. Si el interruptor de la red eléctrica no se encuentra disponible, desconecte el/los cable(s) eléctrico(s) del equipo. La toma de corriente debe ser instalada cerca del equipo y debe estar fácilmente accesible.

Advertência! Certifique-se de que a alimentação principal esteja desconectada antes de instalar os cartões R-series FR1 ou FR2 no quadro ou ao instalar e desinstalar opcionais. Se não houver um interruptor de alimentação principal, o próprio cabo de alimentação do equipamento é o meio de desconexão. A tomada de alimentação deve ser instalada próxima ao equipamento e seu acesso deve ser fácil.

Avvertenza! Verificare che la rete di alimentazione sia scollegata prima di installare i moduli FR1 o FR2 serie R nel telaio, o installare o rimuovere le opzioni. Se non è disponibile un interruttore di alimentazione, il/i cavo/i di alimentazione di questa apparecchiatura forniscono i mezzi di sconnessione. La presa deve essere installata vicino all'apparecchio e deve essere facilmente accessibile.

Warning!

FR2 Dual Power Cord Notice—please read this. To reduce the risk of electrical shock, disconnect both power cords before servicing equipment.

Avertissement ! Notice relative aux doubles cordons d'alimentation de FR2—veuillez lire. Pour réduire le risque de choc électrique, débranchez les deux cordons d'alimentation avec d'effectuer tout entretien de l'équipement.

Warnung! Hinweis zum FR2 mit doppeltem Netzkabel – bitte beachten. Um das Risiko eines Elektroschocks zu verringern, sind beide Netzkabel vor der Wartung des Geräts abzutrennen.

¡Advertencia! Aviso: Cable eléctrico FR2 dual — Por favor leer. Para reducir el riesgo de electrocución, desconecte ambos cables eléctricos antes de reparar el equipo.

Advertência! Aviso do cabo duplo de alimentação FR2 — leia isto. Para reduzir o risco de choque elétrico, desconecte ambos os cabos de alimentação antes de qualquer manutenção no equipamento.

Avvertenza! Avviso cavo a doppia potenza FR2. Per ridurre il rischio di scosse elettriche, scollegare entrambi i cavi di alimentazione prima di effettuare qualsiasi operazione di manutenzione.

Caution!

The FR1/FR2 front fan door is heavy and is not hinged. Remove with Caution.

Attention ! La porte frontale du ventilateur de FR1/FR2 est lourde et ne repose pas sur des charnières. Retirer avec précaution.

Achtung! Die vordere Gebläsetür des FR1/FR2 ist schwer und lässt sich nicht klappen. Bitte vorsichtig entfernen.

¡Precaución! La puerta del ventilador delantero del FR1/FR2 es pesada y no posee bisagras. Extraer con precaución.

Atenção! A porta frontal de acesso aos ventiladores do FR1/FR2 é pesada e não possui dobradiças. Remova com cuidado.

Attenzione! La porta anteriore della ventola FR1/FR2 è pesante e non è a cerniera. Rimuovere con cautela.