Clear-Com
COMMUNICATION SYSTEMS

CLEAR-COM ENCORE

IF4W4   4-CHANNEL FOUR-WIRE INTERFACE

INSTRUCTION MANUAL

CONTENTS

IMPORTANT SAFETY INSTRUCTIONS

Please read and follow these instructions before operating this product.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Only use attachments/accessories specified by the manufacturer.
10. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
11. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
13. **WARNING:** To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.

Please familiarize yourself with the safety symbols in Figure 1. When you see these symbols on this product, they warn you of the potential danger of electric shock if the station is used improperly. They also refer you to important operating and maintenance instructions in the manual.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
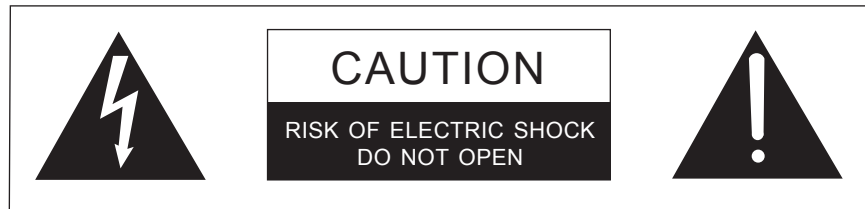
This symbol alerts you to the presence of uninsulated dangerous voltage within the product's enclosure that might be of sufficient magnitude to constitute a risk of electric shock. Do not open the product's case.

This symbol informs you that important operating and maintenance instructions are included in the literature accompanying this product.

Figure 1: Safety Symbols

EMC AND SAFETY

The IF4W4 Interface meets all relevant CE and FCC specifications set out below:

EN55103-1 Electromagnetic compatibility. Product family standard for audio, video, audio-visual, and entertainment lighting control apparatus for professional use. Part 1: Emissions.

EN55103-2 Electromagnetic compatibility. Product family standard for audio, video, audio-visual, and entertainment lighting control apparatus for professional use. Part 2: Immunity.

And thereby compliance with the requirement of Electromagnetic Compatibility Directive 2004/108/EC and Low Voltage Directive 2006/95/EC

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.

OPERATION

INTRODUCTION

Congratulations on choosing this Clear-Com product. Clear-Com was established in 1968 and remains the market leader in providing intercoms for entertainment, broadcast and industrial applications. The ruggedness and high build-quality of Clear-Com products defines the industry standard. In fact, many of our original beltpacks and main stations are still in daily use around the world.

We recommend that you read through this manual completely to better understand the functions of the IF4W4. If you encounter a situation or have a question that this manual does not address, contact your dealer or call Clear-Com directly at the factory. Our applications support and service people are standing by to assist you. (Refer to Chapter 4: "Warranty" for contact information.) Thank you for selecting Clear-Com for your communications needs.

DESCRIPTION

The IF4W4 4-channel four-wire interface is a modular interface that enables up to 4 four-wire communication systems (such as cameras, TELCO lines and 2-way radio) to interface with the Clear-Com intercom system. It matches standard transmit/receive lines (at normal levels) to Clear-Com line level.

The IF4W4 is powered by the Clear-Com line using standard two-conductor shielded mic cable. The cable is run from the output connector of a Clear-Com main or remote station to the rear panel of the IF4W4. One wire carries power, the other wire carries the intercom signal, and the shield acts as common ground.

For each channel the IF4W4 front panel contains 'Out' (transmit), 'In' (receive), 'Null' level controls and level indicators. For all channels a test jack and a four-pin headset XLR connector that connects to built-in test oscillators is provided to set and monitor the circuit nulling of each channel. Press the Null Test pushbutton for the channel you need to adjust.

The 'Link' switches enable you to assign each of the four-wire systems to separate intercom channels, or put two, three, or all four systems on one party line.
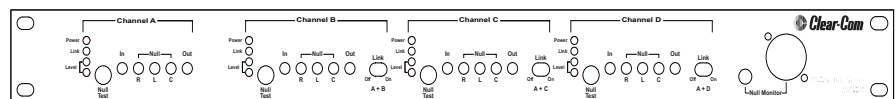

Figure 1-1: IF4W4 Front View

The IF4W4 rear panel provides four three-pin XLR connectors for interfacing up to four different Clear-Com lines, as well as four terminal block connectors for

four-wire input and output. The interface mounts in a standard 19 in. (48.64 cm) equipment rack and is 1.75 in. (4.48 cm) in height.
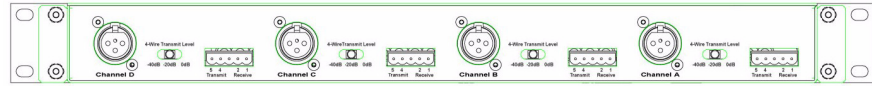

Figure 1-2: IF4W4 Rear View

Installation and setup requirements are the same for all channels of the IF4W4 interface (i.e., A, B, C, or D channels).

OPERATION

For normal operation, the position of the 'Link' switches on the front of the unit do not change after installation. The only controls on the IF4W4 that require adjustment on a day-to-day basis are the 'In' (receive) and 'Out' (transmit) controls on the front of the unit.

NULL ADJUSTMENT

The 'Null' control eliminates most of the receive signal from the transmit signal. This control should be adjusted at installation and when the party-line cable configuration changes. For example, if the number of stations on the party line or the length of the cable increases or decreases.

R, L and C controls provide line-length compensation for adjusting the null. These controls allow nulling for Clear-Com Party Line cable runs from 400 to 4000 feet (122m to 1219m).

To Adjust the Null

1. Connect a TS1 earphone or a four pin XLR headset (for monitoring the test tone provided with the interface) into the 'Null Monitor' connector on the front panel.
2. Push the appropriate test null button for the channel to be nulled. A tone will be audible to help null the circuit.

Note: Depending on the installation the initial tone could be very loud so it is recommended the earphone or headset is not worn until the volume of the tone has been reduced to a safe level.

3. Turn the R, L and C null control in either direction until a decrease in audible tone is observed. Continue to adjust the controls until the tone has become inaudible.
4. Make fine adjustments by going back a couple of times over the R, L and C adjustments for a complete null.

If Complete Null Is Not Possible

1. Check for proper termination of the line.

Note: High frequency is controlled by line compensation. This part of the tone is distinguishable by its buzzing sound.

Repeat the same procedure for each channel.

RECEIVE LEVEL ADJUSTMENT

Adjust the receive level on the interface using the 'In' control while listening to the output of a Clear-Com intercom station. The 'In' control is located on the front panel of the IF4W4. Repeat the same procedure for each channel.

TRANSMIT LEVEL ADJUSTMENT

Adjust the transmit level using the 'Out' control with a conversation on a Clear-Com line. The position of the 'Out' control should provide a strong average *green* light on the LED level indicator on the front panel. Occasional transitions to a *red* light are acceptable. This occurrence indicates a +5dBu line level.

LED THRESHOLD

The green LED goes on at -7dBu. The *green* to *red* threshold is factory set at +5 dBu. To set another threshold level, adjust the LED *threshold adjust* on the IF4W4 board.

Note: *Removal of the cover of the interface is necessary to reach this control. This adjustment should be carried out by qualified personnel only.*

2 INSTALLATION

Installation and setup requirements are the same for all channels of the IF4W4 interface (i.e. A, B, C, or D channels). The following describes installation of a four-channel interface.

The IF4W4 interface can be set up to operate as four independent interfaces, or may be internally bussed into a single common party line. Therefore installation requirements will vary according to the configuration. Installation for four-wire and headset emulation are discussed separately.

PARTY LINE INSTALLATION

To connect Clear-Com to the interface, route a two-conductor shielded cable from a Clear-Com *main* or *remote* station output connector to the IF4W4 rear panel. Connect the cable to the XLR connector input marked Channel A, B, C or D. The pin assignments in a Clear-Com 3-pin intercom connector are:

Pin 1--- Common

Pin 2 --- Power

Pin 3 --- Intercom audio

CONNECTION TO PARTY LINE: INDEPENDENT INTERFACES

In a multi-channel configuration, each channel of the IF4W4 is individually powered from the party-line source (Clear-Com). Connect a Clear-Com line to each of the channels and set *link* switches to OFF.

The figure below illustrates the connections for this type of installation.
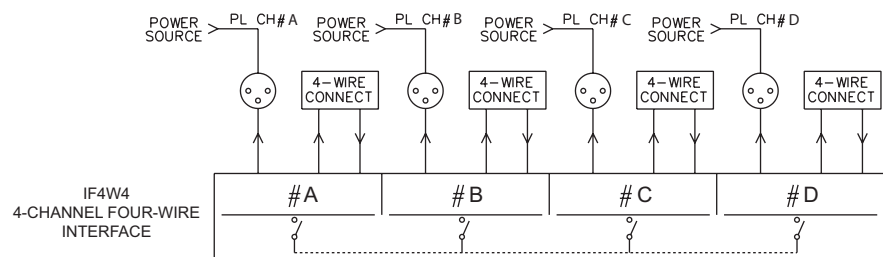

Figure 2-3: Typical Multi-channel Use

FOUR-WIRE IN/OUT

To connect a four-wire device to the interface, for each channel, attach one set of four-wire output lines to one set of terminal block connectors on the IF4W4 rear panel. On the terminal block, pins #1 and #2 are for input (*Receive*) and pins #4 and #5 are for output (*Transmit*). Pin #3 is unit ground.

Note: In the external four-wire link, any artificial sidetone leakage from the transmit to the receive signal must be eliminated as much as possible. For headset emulation (see "Dynamic Mic Headset Emulation" and "Carbon Mic Headset Emulation"), local sidetone in the four-wire devices (i.e. cameras) must be completely turned off.

STANDARD FOUR-WIRE INSTALLATION: LINE LEVEL IN/OUT

The standard four-wire installation provides input/output for general purpose four-wire interfaces. Figure 2-4 shows the IF4W4 connections for this type of installation.
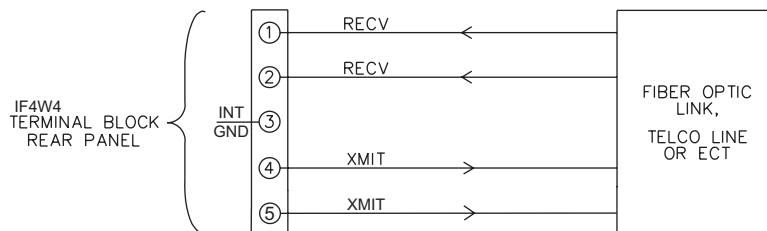
Figure 2-4: Standard four-wire Installation

Note: Local sidetone in the four-wire device must be completely turned off.

DYNAMIC MIC HEADSET EMULATION

Figure 2-5 shows the IF4W4 connections to a Clear-Com style headset connector. Pins #1 and #2 are for microphone output. Pins #4 and #5 are for headset emulation.

Figure 2-5: Dynamic Mic Headset Emulation

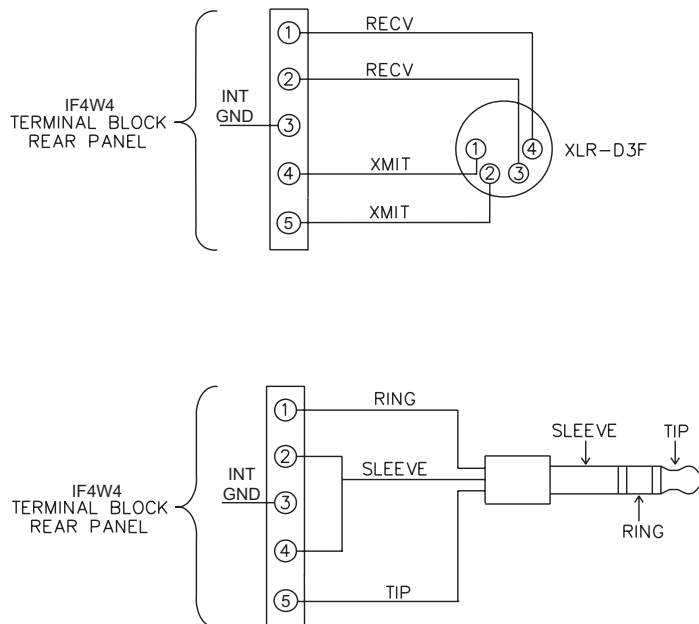## CARBON MIC HEADSET EMULATION

Figure 2-6 shows the IF4W4 connections to a carbon mic headset. Local sidetone in the four-wire device must be completely turned off.
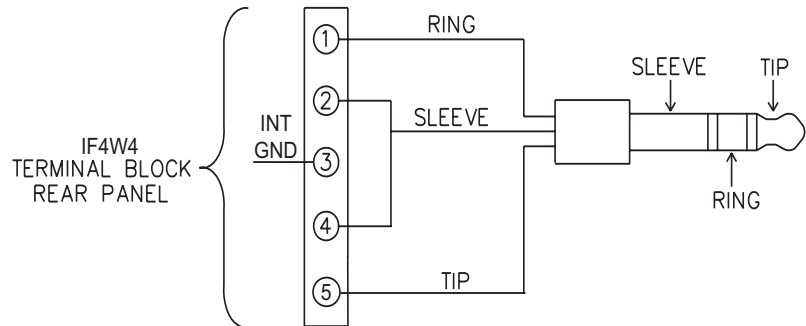

Figure 2-6: Carbon Mic Headset Emulation

Please refer to the technical specification for further information.

3 TECHNICAL SPECIFICATIONS

IF4W4 4-CHANNEL FOUR-WIRE INTERFACE

dBu is an absolute measurement. 0 dBu is referenced to 0.775 volts RMS

Program Line Input
Input Impedance   >= 1KΩ

Party Line Output
Output Impedance   >10KΩ

Stage Announce/Balanced Line Out
Type   Balanced
Output Impedance   >= 80Ω
Load Impedance   >= 600Ω

Frequency Response
Program Input - Party Line   200 - 18KHz ± 3dB
Party Line - Line Out   200 - 18KHz ± 3dB

Max Distortion
Program Input - Party Line   <= 0.2%
Party Line - Line Out   <= 0.5%

Noise
Program Input - Party Line   < -85dBu
Party Line - Line Out   < -60dBu

Max Gain
Program Input - Party Line   >= -16dB
Party Line - Line Out   >= 24dB

Min Gain
Program Input - Party Line   <= -20dB
Party Line - Line Out   <= -45dB

Line Out LED Threshold
Green   -7dBu ± 2dB
Red   +5dBu ± 2dB

Party Line LED Threshold
Green   -10dBu ± 2dB
Red   0dBu ± 2dB

Power

Input Voltage Range	20-30 VDC
Input Current (Idle)	<= 40mA
Input Current (Max)	<= 50mA

Rear Panel Connectors

Intercom:	(4) XLR-3F (1 per channel)
4-Wire Terminal Block Connectors	(4) Connectors (1 per channel)
4-Wire Transmit Level Switches	(4) Switches (1 per channel)

Front Panel Connectors

Headset:	(1) XLR-4M
TS1 Earphone	(1) 3.5mm Jack Socket

Front Panel Controls & Indicators

Green Level LED	(4) LEDs (1 per channel)
Red Level LED	(4) LEDs (1 per channel)
Link LED	(4) LEDs (1 per channel)
Power LED	(4) LEDs (1 per channel)
Null Test Button	(4) Buttons (1 per channel)
Receive Level Adjust	(4) In controls (1 per channel)
Transmit Level Adjust	(4) Out controls (1 per channel)
Nulling Adjust	(12) Null controls (3 per channel)
Channel Link Switch	(3) Link switches (A+B, A+C, A+D)

Environmental

32 - 122° F (0 - 50° C)

Dimensions

19 in. W x 1.75 in. H x 7.75 in. D
(483 mm x 44.5 mm x 197 mm)

Weight

5.83 lbs. (2.65 Kg)

Notice About Specifications

While Clear-Com makes every attempt to maintain the accuracy of the information contained in its product manuals, that information is subject to change without notice. Performance specifications included in this manual are design-center specifications and are included for customer guidance and to facilitate system installation. Actual operating performance may vary.

LIMITED WARRANTY

Vitec Group Communications (VGC) warrants that at the time of purchase, the equipment supplied complies with any specification in the order confirmation when used under normal conditions, and is free from defects in workmanship and materials during the warranty period.

During the warranty period VGC, or any service company authorized by VGC, will in a commercially reasonable time remedy defects in materials, design, and workmanship free of charge by repairing, or should VGC in its discretion deem it necessary, replacing the product in accordance with this limited warranty. In no event will VGC be responsible for incidental, consequential, or special loss or damage, however caused.

VGC offers 24 x 7 customer support if you have an Extended Warranty or Service Contract.

Return Material Authorization (RMA) numbers are required for all returns.

Both warranty and non-warranty repairs are available.

WARRANTY PERIOD

The product may consist of several parts, each covered by a different warranty period. The warranty periods are:

- Cables, accessories, components, and consumable items have a limited warranty of 90 days.

- Headsets, handsets, microphones, and spare parts have a limited warranty of one year.

- UHF wireless IFB products have a limited warranty of one year.

- UHF wireless intercom systems have a limited warranty of three years.

- All other Clear-Com and Drake brand systems and products, including beltpacks, have a limited warranty of two years.

The warranty starts at the time of the product's original purchase. The warranty start date for contracts which include installation and commissioning will commence from the earlier of date of the Site Acceptance Test or three months from purchase.

TECHNICAL SUPPORT

To ensure complete and timely support to its customers, VGC's User Support Center is staffed by qualified technical personnel. Telephone and email technical support is offered worldwide by the User Support Center.

The User Support Center is available to VGC's customers during the full course of their warranty period. Telephone support during the warranty period will be offered at no charge between 09:00 and 17:00 according to the customer's local time zone.

In addition, for customers who purchase an Extended Warranty or Service Contract, 24-hour customer support is offered immediately upon purchase of

such agreement. For more information, contact your authorized dealer, distributor, or sales representative.

Instructions for reaching VGC's User Support Centers are given below.

Telephone for Europe, Middle East and Africa: +49 40 6688 4040

Telephone for the Americas and Asia: +1 510 337 6600

Email: vitec.support@AVC.de

Once the standard warranty period has expired, the User Support Center will continue to provide telephone support if you have purchased an Extended Warranty or Service Contract. In these cases, you will have access to telephone support 24 hours per day, 7 days per week.

WARRANTY REPAIRS AND RETURNS

Before returning equipment for repair, contact a User Support Center to obtain a Return Material Authorization (RMA). VGC representatives will give you instructions and addresses for returning your equipment. You must ship the equipment at your expense, and the support center will return the equipment at VGC's expense.

For out-of-box failures, use the following contact information:

Europe, Middle East and Africa

Tel: +44 1223 815000 Email: customerservicesEMEA@vitecgroup.com

North America, Canada, Mexico, Caribbean & US Military

Tel: +1 510 337 6600 Email: customerservicesUS@vitecgroup.com

Asia Pacific & South America

Tel: +1 510 337 6600 Email: customerservicesAPAC@vitecgroup.com

VGC has the right to inspect the equipment and/or installation or relevant packaging.

NON-WARRANTY REPAIRS AND RETURNS

For items not under warranty, you must obtain an RMA by contacting the User Support Center. VGC representatives will give you instructions and addresses for returning your equipment.

You must pay all charges to have the equipment shipped to the support center and returned to you, in addition to the costs of the repair.

EXTENDED WARRANTY

If you purchase an Extended Warranty, you are also given access free of charge to the User Support Center 24 hours a day, 7 days a week.

You can purchase an extended warranty at any time during the first two years of ownership of the product. The purchase of an extended warranty extends to five

years the warranty of any product offered with a standard two-year warranty. The total warranty period will not extend beyond five years. Any purchase of an extended warranty provides 24 x 7 customer support in addition to the warranty immediately upon purchase of the warranty extension.

Note: VGC does not offer warranty extensions on UHF wireless intercom systems, or on any product with a 1-year or 90-day warranty.

SERVICE CONTRACT

VGC also offers service contracts that provide 24 x 7 telephone support, advance replacements, training, proactive maintenance, on-site visits, and no charge for repair or replacement of equipment. For more information, contact your authorized dealer, distributor, or sales representative.

LIABILITY

THE FOREGOING WARRANTY IS VGC'S SOLE AND EXCLUSIVE WARRANTY. THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY OTHER REQUIRED IMPLIED WARRANTY SHALL EXPIRE AT THE END OF THE WARRANTY PERIOD. THERE ARE NO OTHER WARRANTIES (INCLUDING WITHOUT LIMITATION WARRANTIES FOR CONSUMABLES AND OTHER SUPPLIES) OF ANY NATURE WHATSOEVER, WHETHER ARISING IN CONTRACT, TORT, NEGLIGENCE OF ANY DEGREE, STRICT LIABILITY OR OTHERWISE, WITH RESPECT TO THE PRODUCTS OR ANY PART THEREOF DELIVERED HEREUNDER, OR FOR ANY DAMAGES AND/OR LOSSES (INCLUDING LOSS OF USE, REVENUE, AND/OR PROFITS). SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR THE LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. IN ANY EVENT, TO THE MAXIMUM EXTENT PERMITTED UNDER APPLICABLE LAW, VGC'S LIABILITY TO CUSTOMER HEREUNDER SHALL NOT UNDER ANY CIRCUMSTANCES EXCEED THE COST OF REPAIRING OR REPLACING ANY PART(S) FOUND TO BE DEFECTIVE WITHIN THE WARRANTY PERIOD AS AFORESAID.

This warranty does not cover any damage to a product resulting from cause other than part defect and malfunction. The VGC warranty does not cover any defect, malfunction, or failure caused beyond the control of VGC, including unreasonable or negligent operation, abuse, accident, failure to follow instructions in the manual, defective or improperly associated equipment, attempts at modification and repair not approved by VGC, and shipping damage. Products with their serial numbers removed or defaced are not covered by this warranty.

This warranty does not include defects arising from installation (when not performed by VGC), lightning, power outages and fluctuations, air conditioning failure, improper integration with non-approved components, defects or failures

of customer furnished components resulting in damage to VGC provided product.

This limited warranty is not transferable and cannot be enforced by anyone other than the original consumer purchaser.

This warranty gives you specific legal rights and you may have other rights which vary from country to country.