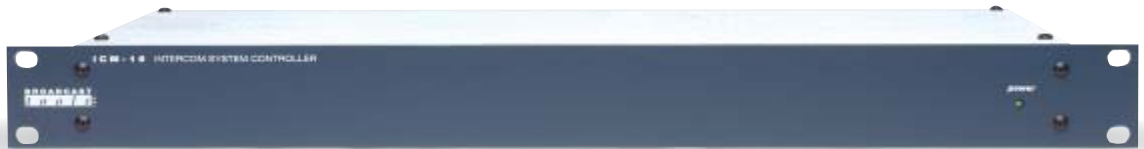




## *Installation and Operation Manual*



### **ICM-16** *Intercom Controller*

Controller firmware version 03.02.97D

Manual Revised 06/17/02

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## INTRODUCTION

Thank you for your purchase of a Broadcast Tools® ICM-16, Intercom Controller (referred to as the ICM-16 throughout this manual). We're confident that this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the Broadcast Tools® ICM-16, Intercom Controller.

## SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

## WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

**Broadcast Tools, Inc.**  
131 State Street  
Sedro-Woolley, WA 98284 USA  
Voice: 360 . 854 . 9559  
Fax: 360 . 854 . 9479

Internet Home Page: [www.broadcasttools.com](http://www.broadcasttools.com)  
E-mail: [support@broadcasttools.com](mailto:support@broadcasttools.com)

**THANK YOU FOR CHOOSING  
BROADCAST TOOLS® BRAND PRODUCTS!**



### CAUTION!

**Broadcast Tools®** Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.



### NOTE:

This manual should be read thoroughly before installation and operation.

### WEBSITE:

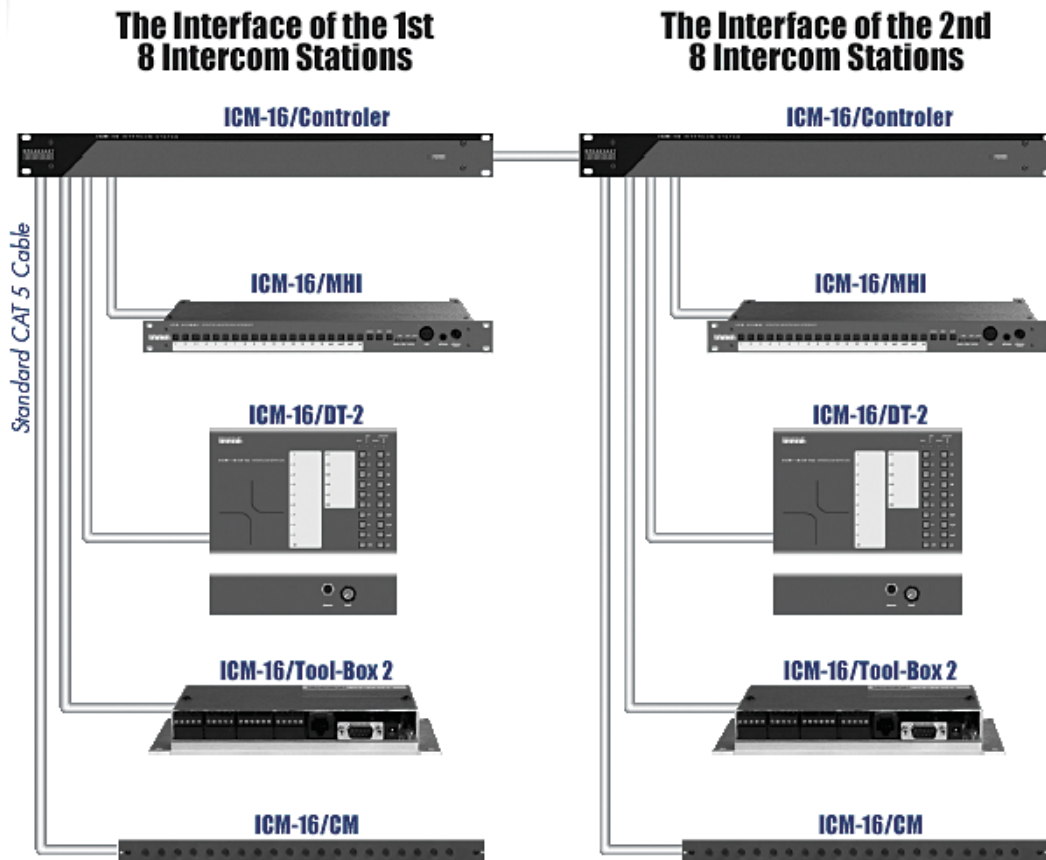
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## PRODUCT DESCRIPTION

The Broadcast Tools® ICM-16 Controller offers connectivity and control of up to eight studios while connecting one additional controller, which will expand the system to a total of 16. The controller is constructed in a one-rack unit high chassis. The rear-panel supports eight RJ-45 modular receptacles, corresponding to each of the eight studio intercom stations. The controller also provides independent send and receive talkback level controls for each studio intercom station. All active balanced send and receive talkback audio is switched with digitally controlled pro-level analog switch arrays, allowing each studio intercom station full duplex, single, group and all-call capabilities. Data rates are preset at 9600 baud, utilizing RS-485 data protocol, which allows for large distances between the controller and each studio intercom station.

### Simplified System Block:



Each Controller handles eight (8) Intercom Stations. One additional controller may be added increasing the system size to sixteen.

## INTERCOM STATION FRONT PANEL DESCRIPTION

### Power:

ICM-16 Controller: Connect the 7-pin DIN power connector into the power receptacle on the ICM-16 Controller and the “Lump in the Line” multi-voltage transformer into a 120 Vac 50-60 Hz power source. The front panel green power LED indicates when power is applied to the unit.

## INSTALLATION

Installation of the ICM-16 Intercom Controller consists of seven steps:

1. Inspection.
2. Bench test and configure the system.
3. Installation of cable runs from each intercom station to the controller.
4. Rack mount the controller.
5. Installation of each intercom station at the desired location.
6. Label each intercom station.
7. Power-up the controller and check operation.

### STEP 1: INSPECTION

Please examine your ICM-16 Intercom Controller carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately. Retain the packaging for inspection by the shipper. The package should contain the ICM-16 Intercom Controller, “Lump in the Line” power transformer, 40 pin ribbon (2 – Controllers) interconnection cable and this manual.

### STEP 2: BENCH TEST AND CONFIGURE THE SYSTEM

#### Bench Test:

- Place the Intercom Controller and each of the Intercom Stations on a work area.
- Remove the cover screws from each intercom station.
- Remove the base or cover.
- Locate the RJ-45 (8-pin modular) and insert one end of the control cable.
- Take the other end of the control cable and insert it into the desired RJ-45 station connector on the controller.

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### DESCRIPTION

## INSTALLATION

### STEP 2: BENCH TEST AND CONFIGURE THE SYSTEM Continued

ICM-16 Controller Configuration:

*NOTE: The 8 - RJ-45 connectors are along the backside of the controller, as viewed from the rear. Intercom station one's (9) connector is on the far left, while intercom station eight's (16) is on the far right. The corresponding send and receive level controls follow this same scheme, the far left trimmers being number one (9), and the far right trimmers being number eight (16). The controller is set up for intercom stations 1 through 8 when it is shipped.*

**To convert the controller for stations 9 through 16, follow these steps:**

1. Remove power from BOTH controllers, along with any cables.
2. Remove the top cover screws from the controller that is being configured for workstations 9 through 16.
3. Locate JP51 and place the jumper over the header.
4. Locate JP3 and move the jumper to 9, JP5 to 10, JP7 to 11, JP9 to 12, JP11 to 13 JP13 to 14, JP15 to 15 and JP17 to 16.
5. Install the supplied 40 pin flat ribbon cable between the two controllers.
6. "INTERCONNECT", J2 header. BE SURE TO VERIFY PIN 1 (Black mark on PCB J2).
7. Reinstall the cover.
8. Reinstall cables and apply power.
9. Verify correct operation.

### STEP 3: INSTALLATION OF (UTP) CABLE RUNS FROM EACH INTERCOM STATION TO THE CONTROLLER

Each intercom station requires a connection between the RJ-45 connectors on the controller and the intercom station. Use off-the-shelf category 5 UTP pre-connectorized cables. Cable and/or connectors may be purchased from a host of vendors. Graybar, Jameco, JDR, Radio Shack, etc. Cable runs should be limited to 1000 feet per workstation.

## STEP 3: INSTALLATION OF (UTP) CABLE RUNS FROM EACH INTERCOM STATION TO THE CONTROLLER Continued

The cable-pairing scheme is as follows:

**NOTE: Please note that all 10BaseT Topology including category 5 UTP control wiring should comply with EIA/TIA 568A standards.**

Pair # 1 – Pins 1 (+) & 2 (-)	/	Receive audio.
Pair # 2 - Pins 3 (+) & 6 (-)	/	Send audio.
Pair # 3 - Pins 4 (+) & 5 (-)	/	RS-485, half-duplex 9600 baud data.
Pair # 4 – Pins 7 (+) & 8 (Gnd)	/	N/A

## STEP 4: MOUNTING

The ICM-16 Controller is designed to be rack mounted in a 19” EIA format equipment rack. It should be mounted in an area that is accessible from the rear and preferably away from sources of heat. The intercom stations should be placed in the desired location.

## STEP 5: CONNECT YOUR EQUIPMENT

Use the same wiring format that was outlined in the bench testing section.

## STEP 6: LABEL EACH INTERCOM STATION

Label each intercom station in the write-in area provided.

## STEP 7: POWER-UP THE CONTROLLER AND INTERCOM STATIONS AND CHECK FOR CORRECT OPERATION.

Plug the specified wall transformers into a stable source of power and recheck the system for correct operation.

## WEBSITE:

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## INSTALLATION

## **SPECIFICATIONS**

Frequency Response:	20 Hz to 20 KHz; +/- 1dB
Signal/Noise Ratio:	>75 dB
THD:	.01 %
Recommended Levels:	-10 to +8 dbu. +27dbu Max.
Switching Method:	Analog switch arrays
Logic:	Microprocessor
Data Format:	9600 baud, RS-485 Half Duplex
Cabling:	UTP, Category 5, 5E or 6 (EIA/TIA-568A)
Connectors:	8 - RJ-45 connectors. (CAT 5)
Power Requirements:	34.5 Vac CT @ 500 ma / 10.5 Vac @ 1 amp. 20 Vac 50-60 Hz. Lump N' Line power transformer supplied.
Physical Dimensions:	19" X 1.75" X 10.0" (WHD) Controller
Weight:	3 pounds
Options:	220 vac, 50Hz (CE) power transformer

## LIMITED WARRANTY

The term “Buyer” as used in this document refers to and includes both (but only) (a) any person or entity who acquires such an item for the purpose of resale to others (i.e., a dealer or distributor of an item), and (b) the first person or entity who acquires such an item for such person’s or entity’s own use.

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## EXCLUSIVE REMEDIES

If Broadcast Tools is notified, in writing, of a failure of any item manufactured by Broadcast Tools to conform to the foregoing Limited Warranty within one (1) year following the date of the Buyer’s acquisition of the item, and if the item is returned to Broadcast Tools in accordance with Broadcast Tools’ instructions for confirmation by inspection of the defect (which at Broadcast Tools’ election may include, without limitation, a requirement that the Buyer first obtain a Return Authorization number from Broadcast Tools, that the Buyer furnish proof of purchase in the form of an invoice and/or receipt, and that the Buyer prepay all freight charges associated with any return of the item to Broadcast Tools using such freight service as Broadcast Tools reasonably may specify, Broadcast Tools will repair or replace the defective item, or will refund the purchase price paid by the Buyer for the item. Broadcast Tools shall have the exclusive right to choose between these alternative remedies.

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### **Broadcast Tools, Inc.**

131 State Street  
Sedro-Woolley, WA 98284 • USA

360.854.9559 **voice** • 360.854.9479 **fax**  
support@broadcasttools.com **e-mail**  
www.broadcasttools.com **website**