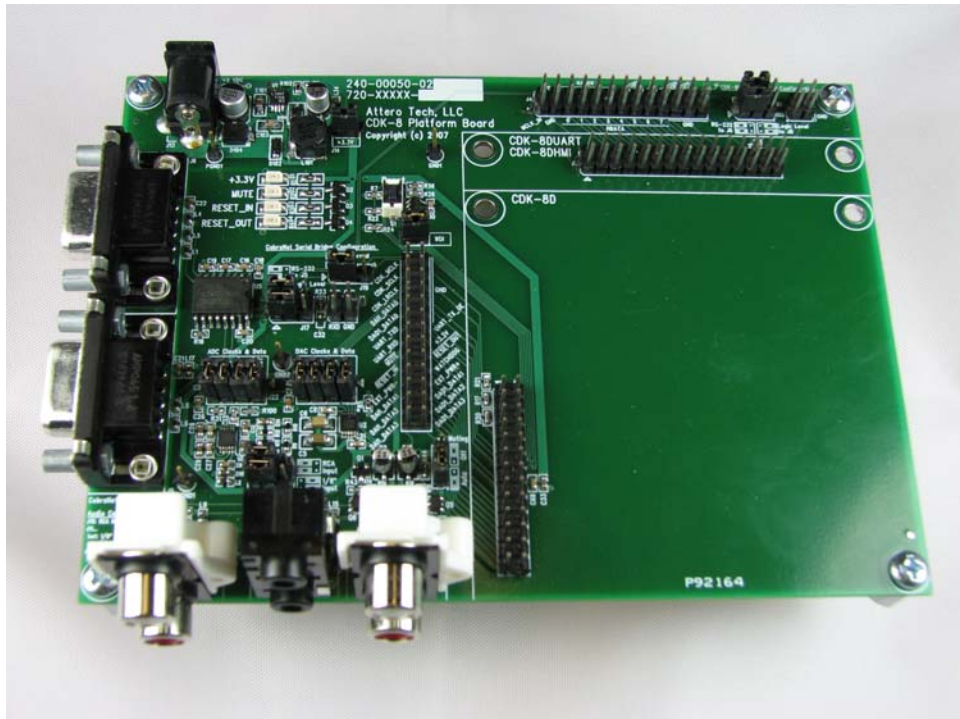


CDK-8 Platform Board

CDK and CobraNet Evaluation Platform



Quick Start Guide

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Revision 03

© Attero Tech, LLC
1315 Directors Row, Suite 107, Ft Wayne, IN 46808
Phone 260-496-9668 · Fax 260-496-9879

622-00004-03

IMPORTANT SAFETY INSTRUCTIONS

The symbols below are internationally accepted symbols that warn of potential hazards with electrical products.



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure -- voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

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 a 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. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and third grounding prong. The wider blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by Attero Tech.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. 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.
14. This apparatus shall be connected to a mains socket outlet with a protective earthing connection.



-- TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

Simple Setup – Stand-Alone Operation

If the CDK-8 Platform Board is purchased as a kit with another CobraNet device, both are already configured for stand-alone operation. If pre-existing CobraNet hardware is being used, the bundles will need to be set up beforehand.

Equipment List

- CDK-8 Platform Board with CDK module installed.
- A second CobraNet device (e.g. CO2 or another CDK-8 Platform Board with CDK module).
- Power supplies for each CobraNet device.
- Ethernet crossover cable.
- Two sets of stereo audio cables with either RCA or 1/8" mini-jack connectors depending on the setup.
- Line-level audio source device with either RCA or 1/8" stereo mini-jack connectors (e.g. CD player, sound card line-out).
- Audio playback device with either RCA or 1/8" mini-jack connectors (e.g. powered speakers, receiver, or sound card line-in).

Procedure

- 1) Connect the Ethernet crossover cable between the two CobraNet devices.
- 2) Connect the output of the line-level audio source to the input of one of the CobraNet devices. The CDK-8 Platform Board provides RCA audio input via J10 and 1/8" audio input via J11-A (bottom). Both the CDK-8 Platform Board and CO2 come preconfigured for RCA inputs.
- 3) Connect the audio playback device to the audio output of the other CobraNet device. The CDK-8 Platform Boards provide stereo output via J11-B(top) and J12 simultaneously.
- 4) Connect an appropriate power supply to the power input jack of each CobraNet device.
- 5) Make sure the audio source and playback systems are properly set up and running. If audio is not heard, reset each board by pressing the Reset switch.

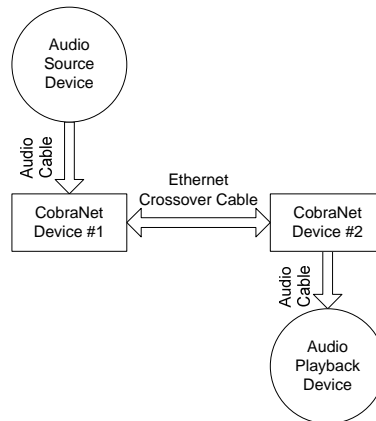


Figure 1 - Stand-alone Configuration

Advanced Setup – Software Control Configuration

Users wanting to demonstrate more advanced features of the CobraNet technology should use the Advanced Setup. This setup gives users the ability to control basic audio routing, monitor device status, and show serial packet bridge functionality by means of the accompanying CobraNet CO2 Demonstration Utility software. Audio signal processing may also be demonstrated and controlled by using the DSP Conductor software from Cirrus Logic.

Equipment List

- CDK-8 Platform Board with CDK module installed
- A second CobraNet device (e.g. another CDK-8 Platform Board with CDK module)
- Three Ethernet patch cables
- Dedicated 10/100 Fast Ethernet switch
- A computer running Windows 2000 or Windows XP *
- DB9 serial cable for serial packet bridge demonstration
- Two sets of stereo audio cables with either RCA or 1/8" mini-jack connectors depending on your setup
- Line-level audio source device with either RCA or 1/8" stereo mini-jack connectors (e.g. CD player, sound card line-out)
- Audio playback device with either RCA or 1/8" mini-jack connectors (e.g. powered speakers, receiver, or sound card line-in)

Procedure

Connect both CobraNet devices and the computer to the 10/100 Fast Ethernet switch using patch cables.

1. Connect the output of the line-level audio source to the input of one CobraNet. The CDK-8 Platform Boards provide RCA audio input via J10 and 1/8" audio input via J11-A (bottom). Refer to the silkscreen for proper configuration. Both the CDK-8 Platform Board and CO2 come preconfigured for RCA inputs.
2. Connect the audio playback device to the audio output of the other CobraNet device. The CDK-8 Platform Board provides stereo output via J11-B(top) and J12 simultaneously.
3. Connect the included serial cable between the computer's serial port and the CobraNet device's serial bridge port. A CDK-8 Platform Board's serial bridge connector is located at J5.
4. Connect an appropriate power supply to the power input jack of each CobraNet device.
5. Install the CO2 Demonstration software on your machine by running the setup.exe file located on the CD-ROM. Run the CO2 Demonstration Utility located under:
Start Menu—All Programs—CobraNet CO2—CO2 Demonstration Utility.
Manipulation of many of the software-controllable features of CobraNet technology can be performed with this utility. For further reference, please consult the User's Manual.
6. Make sure the audio source and playback systems are properly set up and running. If audio is not heard, reset each board by pressing the Reset switch.

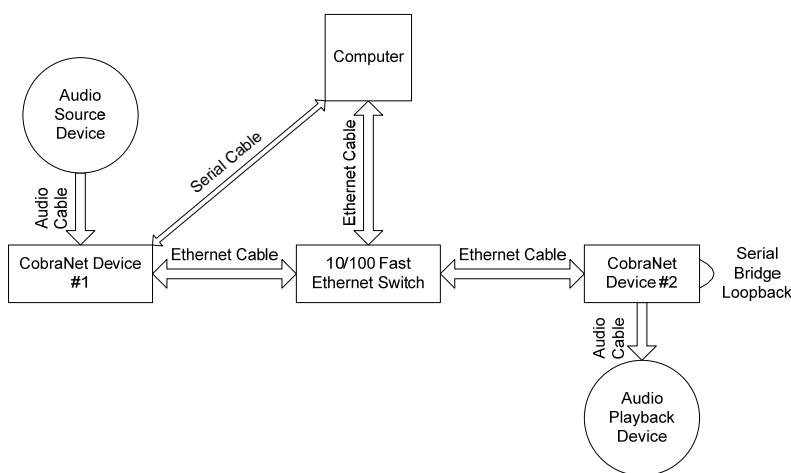


Figure 2 - Software Control Configuration with Serial Bridge Loopback

* At time of writing, the software does not work without modification under Windows Vista. Running the application in XP-compatible mode and with administrative privileges can, in some cases, get the application to operate. However, no guarantees to its operation can be given if used in this manner.

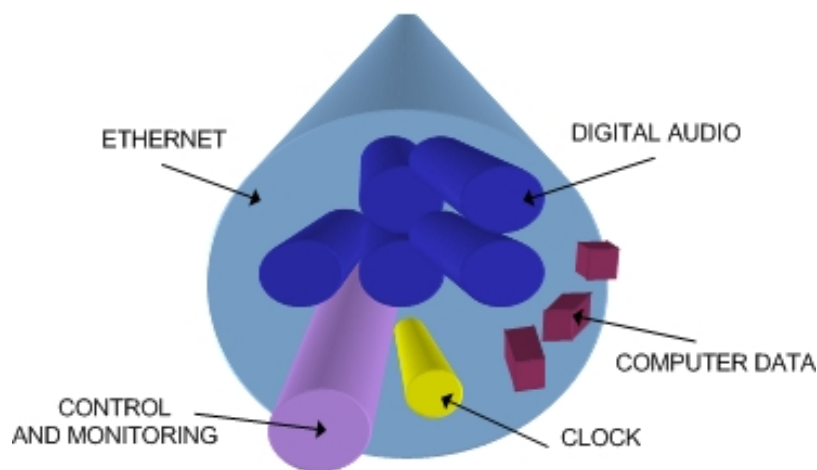
APPENDIX A – Introduction to CobraNet

CobraNet is an audio networking technology for delivery and distribution of real-time, high quality, uncompressed digital audio using a standard Ethernet network. It is implemented using a combination of hardware, firmware, and the CobraNet protocol.

Unlike other audio networking or distribution technologies, CobraNet is a true network and exists on standard Ethernet networks using standard Ethernet hardware. Since it is a true network, audio routing is highly flexible between network nodes and can be used in a variety of audio distribution applications.

In addition to the high degree of routing flexibility that CobraNet provides, the technology also incorporates the ability to monitor and control CobraNet devices remotely. This is a key feature that is highly important in fixed installation applications where the audio distribution equipment may not be readily accessible. All CobraNet devices on the network can be controlled and monitored from a central location by sending control commands and monitoring device specific parameters.

CobraNet provides this capability by implementing Simple Network Management Protocol (SNMP). SNMP is a standard protocol typically used for monitoring network devices such as Ethernet switches. In the case of CobraNet, it allows users to communicate with any CobraNet device using standard SNMP tools or a customized user interface designed specifically for CobraNet, such as Attero Tech’s Control Center application.



The figure above represents the types of data that coexist on a CobraNet network.

Before a CobraNet system can be configured, it is important to first understand how CobraNet distributes audio between devices.

Audio is sent in "bundles" on a CobraNet system. Each bundle is capable of holding up to 8 logical audio channels. Every CobraNet device has a number of bundle transmitters and bundle receivers. These transmitters and receivers are the mechanism used to send and receive bundles between devices.

For a transmitted bundle, audio may be sourced either directly from the local audio inputs of the device or from internal audio via the on-board DSP¹, but not both simultaneously. Internal audio from the onboard DSP could have originally been sourced from the local device inputs, sent from another CobraNet device or even generated by the DSP itself. Combinations of the local or internal audio may exist within a bundle in any order. Additionally, a single audio source in a device may be used multiple times in a single transmitter bundle or across multiple transmitter bundles.

For a received bundle, the received network audio may be routed directly to the device’s local outputs, the internal DSP¹ or simply ignored.

Once the contents of a bundle have been decided, the next step is to pass the bundle to another CobraNet device. To do this, every CobraNet device has up to 4 bundle transmitters. Each bundle transmitter has a transmit mode that must first be selected. This affects how many devices may receive that particular bundle at a time.

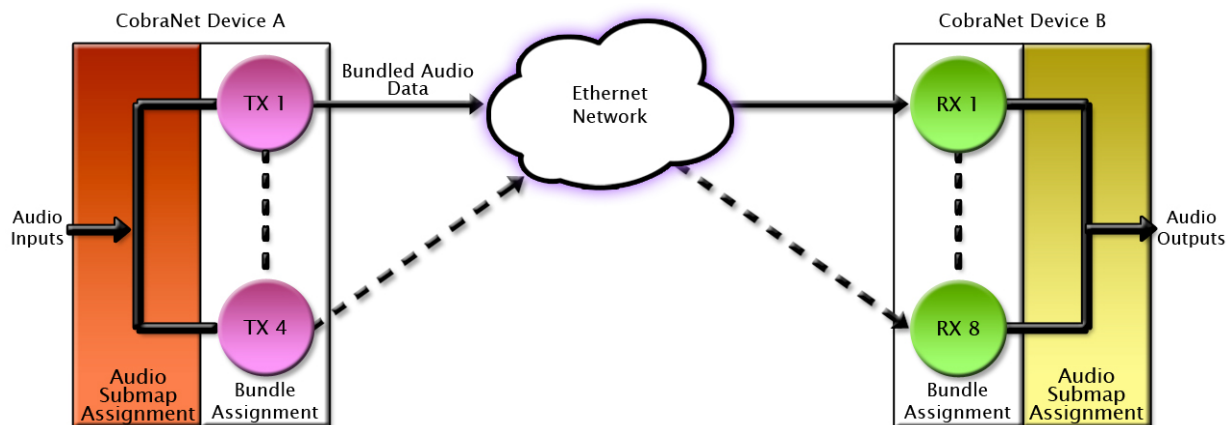
¹ Not available on all devices – CS496xxx devices only

The modes are as follows:

- Unicast – Used for one-to-one connections. In this mode, only one receiver at a time can receive this bundle. Once a link is established from this transmitted bundle to a receiver, any future requests for that bundle from other potential receivers will fail.
- Multicast – Used for one-to-many connections. This mode broadcasts its contents over the entire network. There is no restriction on the number of receivers. However, the downside is that CobraNet packets are distributed to all nodes on the network, whether they need them or not thus creating possible network bandwidth issues.
- Multi-unicasts – Another one-to-many mode. Whilst this is the most efficient method for getting a bundle to multiple receivers in terms of network bandwidth, it requires more processing power on the CobraNet device so in this mode there is a maximum limit of four receiver connections (this can be reduced if required). If more connections are required than the limit, the node can be configured to automatically switches to multicast.

Note: When a bundle must be transmitted to multiple receivers, multi-unicast transmissions should be used where possible.

Once the mode is selected, to enable a device to transmit the bundle, simply allocate the particular transmitter bundle a non-zero number. Since this number identifies all the network packets sent out by that transmitter, each transmit bundle number must be unique on a network².



Now that the transmitter is set up, it is time to set up the receivers. In order to receive bundles, each CobraNet device has up to eight bundle receivers. To enable a device to receive a bundle, simply allocate one of that device's bundle receivers the same bundle number as a transmitted bundle. By doing so, a virtual link is created and audio should now be passed from one device to the other. It should be noted that no knowledge of a device's network topology or connection is thus required in order to configure audio connections. The only restriction to this is that a device cannot be set up to receive a bundle it is also transmitting.

The above case creates a simple, one-to-one, unidirectional link. If more devices are required to receive that bundle, allocate the same transmitted bundle number to a bundle receiver on the other CobraNet devices.

It is also important to note that CobraNet supports simultaneous bidirectional audio distribution in each device. Not only could audio be sent from Device A to Device B but at the same time, should it be needed, audio could also be sent from Device B to Device A. The exact bundle and routing configuration will be determined by the needs of each individual installation. An installation may have multiple units transmitting multiple bundles. The only restriction is the bandwidth available on the network to transfer the audio.

CobraNet does more than just transfer audio data. It can be used to pass serial information as well. A feature called serial bridging has been incorporated that allows the passage of serial data between nodes. Each node can pass serial data to a specific node or multicast the data to multiple nodes. A node can also receive data from either a single source or multiple sources. Baud rates, data bits, stop bits, parity, and so on are all configurable. There is also support for multi-drop serial buses as well.

Finally, CobraNet has the capability to alter all of the above options in real time making the whole system completely dynamic. By use of control software, all of the bundle assignment parameters can be configured with no need to change cables, switch out connectors, or pull new wiring. Most importantly, this control capability can be implemented from a single location!

² Bundle numbers range from 1 through 65535. A value of 0 represents an inactive bundle. Numbers 1-255 are reserved for multicast mode transmissions only.

APPENDIX B- Reference Documents

The following table lists the relevant reference documents.

Document Title
CDK-8 Platform Board User Manual
CDK-8 Datasheet
CobraNet Programmer's Reference (Cirrus Logic)