

**AVA-E**

**Audio/Voice Adapter**

**User's Guide**

Revised October 30,2023

Firmware Version 3.X

# Certifications

## FCC Statement

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This device complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules.

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications.

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 the user's own expense.

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Version 2.x

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## RoHS

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Some models of this product are available in RoHS versions.



This product is available in RoHS versions.

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# Chapter 1

## Introduction

*This chapter provides an overview of features and capabilities.*

The DCB Analog Voice Adapter-Ethernet (AVA-E) is used in pairs to provide a high quality compressed voice channel plus an asynchronous serial data channel through a single composite serial or ethernet data link. The serial network may be synchronous or asynchronous, using leased line modems, radio links, or digital data service. Asynchronous terminal devices may be terminals, printers, computer ports or other asynchronous devices. The voice channel may be connected to standard analog telephone sets, PBXs, key systems, radios, etc. The ethernet network link may be any IP connection, including the Internet, satellite, wireless, and broadband connections.

The asynchronous data port is configurable for speeds up to 57,600 bps. Serial network speeds may be as high as 230.4 Kbps asynchronous or 256 Kbps synchronous. Depending upon the voice quality desired, the voice channel can be configured for bit rates between 2250 and 9600 bps or ADPCM (32K), PCM (64K).

The AVA-E is configured via a USB Setup port using a PC with terminal emulation software or using a web browser connection. Configuration settings are maintained in non-volatile memory.

Additional features of the AVA-E include:

- User configurable voice rate and jitter delay.
- Available with an optional built-in 12 VDC, 24 VDC or 48 VDC power supply.
- Industrial temperature rating of -40C to +85C
- Ethernet IP connectivity over any Internet connection.
- Rack mount options.
- FXS/FXO, 4-wire E&M, or Push-to-Talk interfaces

## Applications

The AVA-E provides quality voice links at minimum bandwidth. While low-bit-rate voice is adequate for many uses, some audio applications require PCM or ADPCM encoding. AVA-E is the rare product that provides both low-bit-rate as well as high quality ADPCM/PCM options.

- Utility substations
- Office to home analog extensions
- High quality Audio over data links for remote voice logging and transmitter control
- Two-way radio audio over slow speed data links
- Gas and oil production, pipelines
- Remote radio dispatch operations
- Phone extensions over wireless and satellite links
- "Hoot 'n Holler" remote public address/ intercom systems using data connections

---

## Other Features

### Multiplexed data port

The AVA-E contains an additional asynchronous interface that is multiplexed along with the voice to corresponding remote AVA units. This is sometimes used for remote transmitter control, cascading an additional AVA unit, or remote control of a computer or controller.

### Flexible Configuration Options

While the AVA-E is normally configured using a web browser, it may also be configured with a local terminal (or PC with terminal emulation) using either of two serial connection methods. **A limited set of configuration items may also be accessed with a telnet client.**

### Voice Interfaces

The AVA-E is available with FXS/ FXO, 4-wire E&M or only push-to-talk (PTT) audio interfaces. PTT is included with the FXS/FXO and E&M units. The interface is specified at the time the unit is ordered. The PTT audio interface is supplied with a microphone and speaker for PTT only orders, and as an add-on item for FXS/FXO and E&M units. The speaker circuit contains a .25 watt amplifier for local PA applications.

### Voice Quality

The AVA-E provides exceptional compressed voice quality at speeds ranging from 2400 to 9600 bps. The compressed voice is based on the same chip set used for Project 25 (P25) radio interoperability. This is a voice chip set that has a very long market life, which translates to a long market life for the AVA-E. AVA-E voice choices also include 64K PCM. The choice of PCM makes the AVA-E suitable for applications that require tone control, such as links to radio transmitters.

### Security Features

Configuration access may be locked down to individual IP addresses. User names and passwords may be required for configuration, and the web server, telnet server, and SNMP server may be disabled for additional configuration security on the ethernet enabled models.

### Extensive audio configuration parameters

In addition to the voice digitization rate, individual settings for each unit include preamp gain, input gain, output gain, jitter buffer, and E&M signaling.

### Rugged, Industrial Quality

With various industrial rated power supply options and industrial temperature rating of -40 to 85 C, AVA-E is at home in the field or office.

## Package Contents

You should find the following items packed with the AVA-E:

- External 100-240VAC power supply (if appropriate)
- Manual on CD
- Warranty, maintenance contract and repair information in the CD manual
- Modem to Composite cable (black) for connecting the AVA-E to an external modem or DSU/CSU
- USB cable for connecting the AVA-E setup port to a PC for configuration

If any of the above are missing, contact your dealer immediately.

## Configuration Software Requirements

The AVA-E requires a modern web browser for configuration. The PC should be configured with a compatible IP address. The default AVA address is 192.168.0.1.

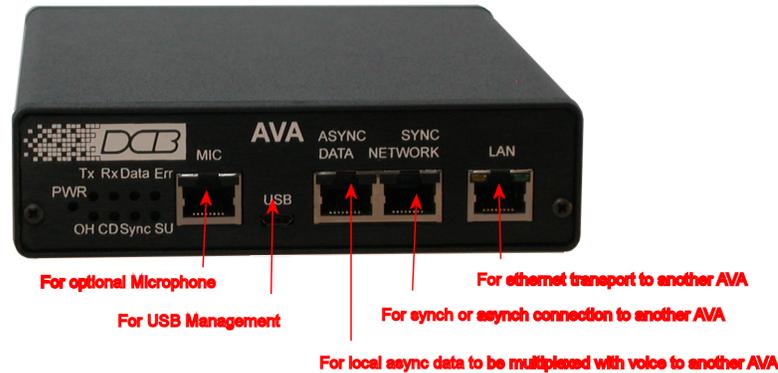
Configuration of the AVA-E through a serial port requires a terminal emulation program on the PC, and use of the USB connection (with the supplied USB cable) additionally requires compatible USB drivers be installed on the PC. The latest drivers may be downloaded from

<http://www.ftdichip.com/Drivers/VCP.htm>.

## AVA-E Hardware

### Front Panel

The front panel contains LED indicators, a microphone connection, USB configuration port, Asynchronous data port, Synchronous network port, and Ethernet network port.



### Front Panel LED Indicators and Connections

#### Indicators

- POWER – is ON when the AVA-E is connected to power.
- Tx – Transmit Data is being sent out the network port
- Rx – Receive Data is being received on the network port.
- Data – TX or RX Data is present on the **ASYNC DATA** port.
- Err – Flashes for data port errors (framing, overrun, parity) and for network receive block checksum errors.
- OH – Flashes when the voice port is active.
- CD – On when DCD is present on network port.
- Sync – On when network port is set for synchronous operation. Off when serial network port is set for asynchronous operation, or when LAN port is used.
- SU – Flashes when DIP switch 2 is up and unit is reset. This maps the setup functions to the **ASYNC DATA** port on the front of the AVA-E.
- There are also two LED indicators on the Ethernet LAN connector. Yellow for 10M ethernet and Green for 100/1000 Mbit ethernet.

#### Connections

- Microphone Connection for local microphone
- USB Configuration connection (used for serial configuration)
- Asynchronous RS-232 data connection
- Synchronous or asynchronous RS-232 network connection\*

- Ethernet LAN network connection\*

\*Note that either the RS-232 network or the Ethernet LAN network may be used, but not both.

## Rear Panel



## Real Panel Connections and Switches

### Connectors

- Power Connector: Either a 6VDC coaxial connector for the AC powered units or a multi-pin screw connection connector used for DC powered units.
- Two pin screw connection for an optional audio speaker (Audio Output).
- RJ-45 E&M connection.
- RJ-11 FXS/FXO connection.

For details on configuration of the speaker, E&M and FXS/FXO options, refer to the **Voice Settings** section.

### Switches

Four DIP switches are accessible on the rear of the unit. Their functions are as follows:

Switch 1 – not used

Switch 2 – If up when unit is reset, the RS232 **ASYNC DATA** port becomes the setup port.

Switch 3 – Factory use only.

Switch 4 – not used

There is also a RESET switch accessible through a small hole in the rear panel.

#### NOTE

The AVA-E is not operational while in switch 2 setup mode. If switch 2 is used for setup, connect the PC Com port to the AVA-E using the cable shown in the **Cables** section of this document, (**Data Port to a PC Com Port**). Set the PC terminal emulator for 9600, 8,N,1 and no flow control. Set switch 2 UP and press reset to enter setup mode. To exit setup, put switch 2 DOWN: This will cause the unit to reboot and be ready to resume normal operation.

---

## Chapter 2

# Installation

### Overview

The AVA-E may be configured using a LAN connection and a web browser, through a USB connection to a local PC, or through an RS-232 serial connection to a local PC. A more limited set of configuration options are available through a telnet session, as described in the **Telnet Setup** section.

The AVA-E is most easily configured using a web browser directed to its address. If the default address of 192.168.0.1 is appropriate for your local network, then plug it in and simply direct your web browser to the AVA-E and continue with configuration. If this address is not appropriate for your network, the AVA-E's IP address must be configured using the initial terminal method below.

### Setup

The network ports must be configured properly for the type of link used (Sync serial, Async serial or LAN). If required, the **ASYNC DATA** port and voice port must also be set correctly for the application. See details of the CN, CP and CV commands in the section on **USB Configuration Port**. For applications using the ethernet LAN, see details in the section on **Web Browser Configuration**.

### Using Leased Line Modems

In this section, a reference to “the modem” includes modems, digital radios or DSU/CSUs for leased line installations. Additionally, a reference to the “network port” is specifically the **SYNC NETWORK** port on the AVA-E: *The LAN port will not be used in the configuration described in this section.*

Connect the modems to the phone line and power ON the modems. Confirm the presence of carrier at each modem. If carrier is not detected at both ends, recheck the option settings. If carrier is still not present, check the cable from the telephone line to the modem. If everything is correct and still no carrier call the manufacturer of the modem or contact the telephone company for assistance.

Connect the AVA-E network port to the modem. A two foot RJ45 to DB-25 male cable connects the network port of the AVA-E to the data port of the modem (usually a DB-25 female connector). See the **Cables** section for details.

Connect the AVA-Es to power.

Power and CD indicators on the front panel of the AVA-E must be ON indicating the on-line condition (see Chapter 1: **Front Panel LED Indicators and Connections**).

## Cabling

Cabling between the AVA-E and the computer ports or terminal devices is a common source of installation problems. The AVA-E must have data from attached terminal devices or computer ports as an input on position 6 of the **ASYNC DATA** RJ45 connector. Data from the AVA-E to any attached equipment will be transmitted on position 5 of the same RJ45 connector. See the **Cables** section of this document for pin position locations on the RJ45 connector and to determine the correct cables for your computer and terminal devices.

## Parity Considerations

AVA-Es transfer all character bits whether it is 7 data bits plus parity or 8 data bits plus none, even or odd parity (7,N,1 is not supported). All 7 bit plus parity data should use the 8N1 setting. When 8E1 or 8O1 is enabled, parity is tested on the incoming data port characters, and the character is discarded if the parity is incorrect.

## Voice Bandwidth Requirements

The following chart shows the bandwidth required for each voice rate setting. The maximum sustained data bandwidth is the network rate minus voice bandwidth.

Voice Rate (bps)	Bandwidth Required (bps)	Minimum Network Rate (bps)
2250	4375	4800
2400	4375	4800
3600	5875	9600
4800	7375	9600
6400	9375	9600
8000	11375	19200
9600	13375	19200
ADPCM (32K)	45500	57600
PCM (64K)	84500	115200

## Voice Settings

Select the proper voice channel settings for your application based on the following chart. The voice interface is selected by the CV command and/or internal jumper settings.

Equipment		Voice Interface	
Local	Remote	Local	Remote
Analog Phone <sup>1</sup>	Analog Phone <sup>1</sup>	FXS <sup>2</sup>	FXS
Analog PBX Ext.	Analog Phone	FXO <sup>3</sup>	FXS
Analog PBX Ext.	Key System	FXO	FXS
Key System	Analog Phone	FXS	FXS
Key System	Key System	FXS	FXS
Analog Phone Line	Analog Phone	FXO	FXS
PBX 4-wire tie line	PBX 4-wire tie line	E&M	E&M
PTT Microphone	Speaker	MIC-PTT	E&M <sup>4</sup>

- 1 – Digital or “feature” phones of the type used by some PBX systems are not supported.
- 2 – To set the FXS/FXO port for FXS, set the jumper on J6 to the left.
- 3 – To set the FXS/FXO port for FXO, set the jumper on J6 to the right.
- 4 – Set internal jumper J4 to position 2,3 to route audio output to rear panel audio connector.

**FXS** – In this mode, the AVA-E provides DC voltage and current (talk battery) for a local telephone instrument. By monitoring the presence or absence of current to the telephone instrument, the AVA-E detects whether the phone, or telephone equivalent, is idle (on hook) or busy (off hook). This information is then

transmitted to the far end AVA-E. The on-hook or off-hook information is then relayed to the telephone switching equipment by the far end FXO unit. Tone dial DTMF tones are transferred transparently, pulse dialing is not supported.

In an FXS to FXS configuration automatic ring-down is enabled. When the telephone at one end is off-hook, the telephone at the other end rings automatically. If the always off hook option is enabled, no ringing occurs.

#### CAUTION

Excessive ringing loads on the voice circuits can cause damage to the units! Old style telephones with “bell” ringers will damage the equipment. Use newer phones with electronic ringers having a ringer equivalence of 1.0B or less.

**FXO** – The FXO mode is the inverse of the FXS mode. The FXO interface appears as a telephone instrument to the attached equipment. When in FXO mode, the AVA-E’s signaling circuits are conditioned to detect an incoming ring signal, representing an incoming call, and to provide a DC path (loop closure) to the PBX or central office switch to indicate on-hook/off-hook status. When ringing is detected, the FXO end will send an incoming call indication to the FXS unit at the far end, thus instructing it to ring its phone. When the far end FXS unit detects an off-hook condition, it sends an off-hook indication to the near end FXO which then provides an off-hook (loop closure) state to the telephone switching system. In this manner, the FXS/FXO pair together make the two AVA-E units at the two ends of the line appear “transparent” to the operation of a normal telephone line. Thus the user may establish the same type of telephone services over the circuit derived through the use of the AVA-E multiplexers that he or she could by direct connection over a normal telephone pair. In other words, the AVA-E multiplexer will not interfere, and will pass essentially unchanged, the signaling normally present in a standard telephone line connection. FXO to FXO connections are not allowed.

**E&M** – In this mode, the AVA-E interfaces to the tie trunk port of a PBX, and provides a Type 1 E&M signaling interface. This is a logic level type interface, where typically the PBX places battery voltage on the M-lead to indicate an off-hook condition to the AVA-E, and the AVA-E in return, places a ground on the E-lead to indicate a busy condition to the PBX. The E&M interface of the AVA-E is available on the eight wire modular jack marked “E&M”, and provides for four-wire voice operation.

There are two modes of E&M operation. In normal mode the audio channel is always active and voice transmission can occur with or without M-lead control.

In M-input mode, analog voice transmission will occur only when the M-lead is driven to -48v with respect to E&M ground, or when the "PTT In" pin of the MIC/PTT interface is grounded.

**MIC-PTT** – In this mode a Push-to-Talk Microphone (available from DCB) is connected to the front panel MIC port. The audio output at the far end is controlled by internal jumper J4 .

## Resetting Factory Defaults

The factory default settings for the AVA-E data and voice ports are as follows:

Serial Network Port (“**SYNC NETWORK**”):

Modem type Async  
Rate 57.6 Kbps

Data Port (“**ASYNC DATA**”):

Rate 9600 bps  
Parity None (8N1)  
Flow Control None  
Transmit Timer 10ms  
DCD to RxD holdoff 0 ms (DCD forced ON)

## Voice Port Gain Settings:

Mode	Preamp	Input	Output
-----	-----	-----	-----
FXS	+0dBm	-3dBm	-3dBm
FXO	+0	-6	-6
PTT	+24	+0	+0
E&M	+0	+0	+0

Voice rate 3600 bps  
 Voice input FXS/FXO (jumper selectable)  
 Voice jitter delay 140 ms

## LAN Port:

IP: 192.168.0.1  
 Subnet Mask: 255.255.255.0

AVA ID: AVA1

To reset the unit to factory defaults use the !R command from the setup menu. This will not affect the LAN Port settings. Other methods to reset to factory defaults are detailed in the **Troubleshooting** section.

## Internal Jumpers

There are several internal jumpers in AVA-E. Only jumpers J4 and J6 are typically of interest to the AVA-E user. To access the jumpers, remove the two screws from the front panel and slide the enclosure cover forward about three inches. The jumper functions are noted below.

- J1 – Factory Only.
- J2 – Factory Only.
- J3 – 1,2 - Ties signal ground to chassis ground.
- J4 – 1,2 - Audio out to E&M interface.
- J4 – 2,3 - Audio out to AUDIO connector.
- J5 – 1,2 - Forces the unit to factory default if removed when unit is reset.
- J6 – When set to the left, sets interface to FXS.
- J6 – When set to the right, sets interface to FXO.
- J7-- E&M Configuration. This silkscreen label indicates “TY1” for one position and “TY5” for the other position.

J7 physically connects the E&M RJ45 pin 7 input to either the negative side of the relay coil or the input of an inverter.

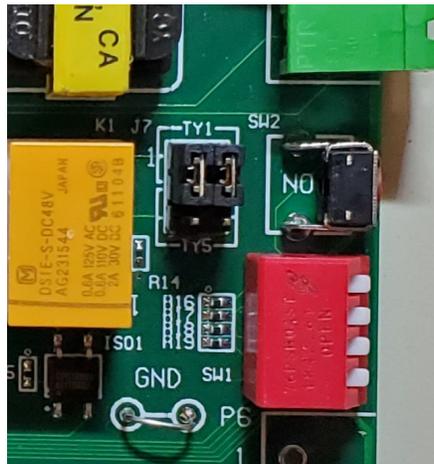
When in the TY1 position, the E&M input is connected to the relay and -48V is needed to go off-hook. In addition, E&M pins 1 and 8 are isolated from AVA signal ground. In the TY5 position the TTL inverter input is pulled high with a resistor and an external ground on pin 7 will force off-hook. TY5 connects E&M pins 1 and 8 to AVA signal ground.

When J7 is set for TY1:

1. E and M signal returns use either pin 1 or 8 or both.
2. E&M E output, pin 2, maximum on-hook (open circuit) voltage: +/-350V  
 continuous off-hook (short to pins 1/8) current: +/-100ma
3. E&M M input, pin 7, on-hook voltage: open circuit off-hook voltage range: -39VDC to -76VDC typical off-hook current: -5ma @-48VDC

When J7 is set for TY5:

4. E and M signal returns use either pin 1 or 8, both are connected to AVA signal ground.
5. E&M E output, pin 2, on-hook (open circuit) voltage: +350V maximum continuous off-hook (short to pins 1/8) current: +100ma maximum
6. E&M M input, pin 7, on-hook voltage: open circuit off-hook voltage: short to pins 1/8 typical off-hook current: 0.33ma



Jumper J7

## Telnet Setup

AVA-E models contain a telnet configuration server that responds to telnet on port 8000. *The telnet server is used only for ethernet LAN setup: No voice configuration or serial port configuration is performed via telnet.* The default IP address is 192.168.0.1. The menu visible during telnet setup is identical to that shown in the section **Configure LAN (CL)**.

## Chapter 3

# Command-Line Configuration

*This Chapter describes how to configure the AVA-E using a terminal program.*

## USB Configuration Port

### Introduction

The USB setup port *may* be used to configure the AVA-E for operation with Ethernet LAN as the network, but if the network connection will be through the **SYNC NETWORK** port, either the USB port or the **ASYNCR DATA** port *must* be used for configuration. Some configuration values are not available via serial connection setup.

### Connections and Terminal Setup

Connection to the Setup port is through the USB port on the front of the AVA-E. Use the USB cable provided to connect to a PC USB port. When connected, the AVA-E will create a COM port on the PC. Use terminal emulation software (e.g. PuTTY, Tera Term, HyperTerminal) to connect to this COM port. Set the PC for 57600, 8 data bits, no parity, one stop bit and no flow control. When connected, you should see:

```
Analog Voice Adapter (AVA) Vx.y
```

```
AT YOUR COMMAND >>
```

### Using the Setup Port Commands

To activate the Setup port press the <Enter> key. When you see **AT YOUR COMMAND >>**, the Setup port is active and ready for your commands. Type H <Enter> to display the command set.

The following Error Messages may be displayed if an incorrect command is typed.

Error Message	Meaning
What?	Invalid command entered.
Not allowed!	Illegal remote command entered.
Remote AVA did not respond!	Network link is down.
ERROR: No FXS/FXO (J6) jumper detected!	J6 jumper removed. (See “ <b>Internal Jumpers</b> ” section)

### Help (H or ?)

Command Summary

-----  
Config/Show:

```
LAN.....CL
Network.....CN/SN
Port.....CP/SP
Voice.....CV/SV
Show Config.....SC
Show Status.....SS
Activity/Zero.....AC/Z
```

```
ID.....ID
Type.....TY
Reset.....RE
Load Defaults.....!R

Connect Remote.....CR
Test Tools.....TT
Time.....TI

Repeat Last Cmd.....*
Help.....H,?
```

This Help screen shows the choice of commands available. The commands allow you to display selected options and configure the AVA-E. To leave individual options unchanged, press <Enter> to move to the next option. To return to **AT YOUR COMMAND >>** and abort any current changes, press <Esc>.

## **Configure LAN (CL)**

---

```
AVA LAN V1.2
-----
Device Name: AVA003E7B
Physical Location: Head Office

Configuration setup.

[Press any key to continue]

AVA LAN Setup Menu
-----
1 Local LAN Configuration
2 Remote LAN Configuration
3 Security Configuration
4 Configure Access
5 Configure SNMP
6 Display Config Summary
  Z Zero Activity Counts
7 Reset Configuration to Default
8 Save and Exit
0 Exit without Saving

Choose a Number =>
```

Use option 1 to change the LAN port IP address if required. After that you may use a web browser to configure the unit. See the **Web Browser Configuration** section for details. *Note that the AVA-E will reboot upon exit from the LAN Setup Menu, even if no changes were made.*

## **Configure/Show Network (CN/SN) – When Using LAN Port**

---

```
Config Network
-----
Network: LAN PORT
IP Address: 192.168.0.1
IP Port: 3000

New Network Port Select? [LAN SERIAL] >>
```

(Note: If the new network port were to be selected as Serial at this prompt, the **CL** option will vanish from the terminal menu.)

To leave a setting unchanged, press <Enter>. Use the SN command to display the settings without changing.

### Configure/Show Network (CN/SN) – SYNC NETWORK Port as Async

```
Config Network
-----
Network: LAN PORT
IP Address: 192.168.0.1
IP Port: 3000

New Network Port Select? [LAN SERIAL] >> S
New ASYNC or SYNC network? [A/S] >> A
New rate? [4800 9600 19200 38400 57600 115200 230400] >> 115200

NETWORK: ASYNC - 115,200 bps
```

In this example we have started with the default network (Ethernet LAN) and instead chosen to use the **SYNC NETWORK** port set for Asynchronous operation at 115,200 bps. After making the three selections, the AVA-E will perform a Reset and return to the **AT YOUR COMMAND >>** prompt.

To leave a setting unchanged, press <Enter>. Only the first two digits are required to select the rate. Use the SN command to display the settings without changing.

### Configure/Show Network (CN/SN) – SYNC NETWORK Port as Sync

```
Config Network
-----
Network: LAN PORT
IP Address: 192.168.0.1
IP Port: 3000

New Network Port Select? [LAN SERIAL] >> S
New ASYNC or SYNC network? [A/S] >> S

NETWORK: SYNC
```

In this example we have started with the default network (Ethernet LAN) and instead chosen to use the **SYNC NETWORK** port set for Synchronous operation. After making the two selections, the AVA-E will perform a Reset and return to the **AT YOUR COMMAND >>** prompt.

To leave a setting unchanged, press <Enter>. Use the SN command to display the settings without changing. Note that a synchronous network must be connected to the **SYNC**

**NETWORK** port in order for the data rate to be established. Using the SN command without the network connected will display the following:

```
Network: SYNC - no sync clock detected
WARNING: 0 sync network rate is too slow for 3600 voice rate!
```

## **Configure/Show (Async) Port (CP/SP)**

---

Config Port

```
-----
Port rate: 9600 bps
Parity: NONE (8N1)
Flow control: NONE
Idle Timeout: 10 ms
DCD to RXD on holdoff: 0 ms (DCD FORCED ON)
RXD to DCD off holdover: - ms (Line only appears for nonzero holdoff values)

New Rate? [1200 2400 4800 9600 19200 38400 57600 CR(custom rate) ] >>
New Parity? [NONE EVEN ODD] >>
New Flow Control? [RTS XON NONE] >>
New Idle Timeout? [0 - 250 ms] >>
New DCD to RXD Holdoff? [1 - 250 ms; 0=DCD ON] >>
New RXD to DCD Holdover? [0 - 250 ms] >> (Line only appears for nonzero holdoff values)
```

Only the first two digits are required to select the rate.

Custom data rates are available to match non standard speeds of existing equipment. At this time a custom data rate can only be programmed and viewed via the USB management port. The web configuration pages only allow a standard serial port rate selection.

The parity setting is for data using 8 data bits plus parity only. All 7 bit plus parity data should use the NONE setting, (7,N,1 is not supported).

Flow control options are RTS/CTS, XON/XOFF and NONE.

The Idle Timeout setting delays network transmission until an entire block is received from the terminal device. This insures data integrity and prevents fragmented blocks. Settings are from 0 to 250 ms. Default is 10ms.

DCD to RXD Holdoff can be set from 1 to 250ms. This is the time between Port DCD being asserted and data being sent out the port to the attached device. For example, if you are using a 202T modem off the

data port, you may want to set the RXD holdoff to match the modem RTS/CTS delay and use the AVA-E DCD signal to drive the modem RTS signal. When set to 0, DCD is forced ON.

If DCD is not forced on, the RXD to DCD Holdover delay may be set to a value between 0 and 250ms. This will hold port DCD on for the designated time after the port buffer empties. This can help insure that all data gets to the attached device.

Use the SP command to display the settings without changing.

## Configure/Show Voice (CV/SV)

```
Config Voice
```

```
-----
Interface:  FXS
Preamp gain:  +0 dB
Input gain:   -3 dB
Output gain:  -3 dB
Voice rate:   3600 bps
Jitter delay: 140 ms
```

```
New Interface? [1=FXS 2=MIC-PTT 3=E&M] >>
New Preamp gain? [0 +6 +12 +24 dB] >>
New Input gain? [-42 to +20 dB] >>
New Output gain? [-42 to +20 dB] >>
New Voice rate? [2250 2400 3600 4800 6400 8000 9600 ADPCM PCM] >>
Always off-hook on FXS interface? [Y/N] >>
New Jitter delay? [40 - 600 ms] >>
```

The input voice waveform is amplified by the sum of the preamp gain and the input gain. The preamp gain provides a coarse setting while the input gain supports a finer adjustment.

The output voice waveform is amplified by the output gain setting.

Only the first two digits are required to select the rate. If the network rate is too slow to support the selected voice rate, a WARNING message will be displayed.

The always off-hook on FXS interface option provides a 2-wire E&M-like interface on the FXS port. That is, there is an open bi-directional audio channel at all times. No ringing is provided in this mode. This option is not available if the interface is strapped for FXO.

If the E&M interface is selected there is an option to use M-input to control transmit. In this mode, analog voice transmission will occur only when the M-lead is driven to -48v with respect to E&M ground(+).

More jitter delay means more buffered voice packets and increased end to end voice delay. Less jitter delay raises the possibility that the buffer will empty due to network multiplexing or radio delays, and audio glitches may be heard. Jitter delay is set in 20ms increments.

**AVA-E will perform an automatic reset at the end of the CV command, unless no values were changed.**

Use the SV command to display the settings without changing.

## Show Configuration (SC)

---

AVA Config

-----  
Network: LAN PORT  
IP Address: 192.168.0.1  
IP Port: 3000

Port rate: 9600 bps  
Parity: NONE (8N1)  
Flow control: NONE  
Transmit timer: 10 ms  
DCD to RXD on holdoff: 0 ms (DCD FORCED ON)  
RXD to DCD off holdover: - ms (*Line only appears for nonzero holdoff values*)

Interface: FXS  
Preamp gain: +0 dB  
Input gain: -3 dB  
Output gain: -3 dB  
Voice rate: 3600 bps  
Jitter delay: 140 ms

AVA ID: AVA1

## Show (Voice) Status (SS)

---

Voice Status

-----  
FXS interface enabled  
FXS is on-hook

E&M input is on-hook  
E&M output is on-hook

## Activity(Counts)/Zero (AC/Z)

---

Activity Counts

-----  
Network TX out = 0  
Network RX in = 0  
RX Errors = 0

Data TX in = 0  
TX Errors = 0  
Overflow = 0  
Data RX out = 0

Voice TX in = 0  
Voice RX out = 0  
Underflow = 0

```
Remote connects = 0
```

```
Local E&M off-hook count = 0  
Remote E&M off-hook count = 0
```

```
Counts were cleared 0 days, 0 hrs, 41 mins, 43 secs ago.  
NOTE: Use Z command to Zero activity counters.
```

The Network TX out and RX in counts show the number of network blocks sent to the network and received from the network. RX Errors shows the number of network blocks received with a checksum error. If a block format error of some sort occurs before the checksum calculation, the block is discarded silently.

The Data TX in and RX out counts show the number of characters received from the DTE and sent to the DTE. TX Errors shows the number of TX characters with a framing error or overrun error. Framing errors may occur when the data port is set to the wrong serial data rate.

The Overflow count shows the number of times the serial input buffer has overflowed. Generally, overflow errors mean that the port is not set for the proper flow control or the DTE does not use flow control. When the buffer overflows, all buffered data is discarded.

Voice TX in and RX out shows the number of voice packets sent and received from the network.

The Underflow count is the number of times that the voice packet jitter buffer empties during an active voice session. This can occur if the network is interrupted or if network end to end delays vary widely. When the jitter buffer underflows, the AVA-E has no new voice packets to send to the decoder, and the result is a glitch in the recovered audio. When an underflow is detected, the AVA-E will stop sending voice packets to the decoder until the jitter buffer again fills above the jitter level.

Remote connects is the number of times remote control of the unit has been activated.

Counters show the number of times the local and remote voice port goes off-hook.

The elapsed time since the counters were last cleared is displayed. Use the Z command to zero the counters.

## **(Unit) ID**

---

```
AVA ID: AVA1  
New ID? [16 char max] >>
```

Unit ID does not affect operation of the AVA-E. It is provided for documentation purposes only.

## Type (TY)

---

```
Type: Analog Voice Adapter (AVA)
Ver: Vx.y mm/dd/yyyy
Boot: Vx.y
ID: AVA1
```

```
AVA up time: 0 days, 0 hrs, 46 mins, 41 secs
```

## Reset (RE)

---

```
Reset AVA? [Y/N] >> Y
Wait for reset...
```

```
Analog Voice Adapter (AVA) Vx.y
```

```
AT YOUR COMMAND >>
```

## Load Defaults (!R)

---

```
Load AVA default config? [Y/N] >> Y
Restored AVA default config.
Wait for reset...
```

```
Analog Voice Adapter (AVA) Vx.y
```

```
AT YOUR COMMAND >>
```

## Connect Remote (CR)

---

```
AT YOUR COMMAND >> CR
Connect to remote AVA...
CONNECTED to remote AVA
-----
```

```
Analog Voice Adapter (AVA) Vx.y
REMOTE COMMAND [EXIT to disconnect] >>
```

While this connection is active, the normal **AT YOUR COMMAND >>** prompt is replaced with the **REMOTE COMMAND >>** prompt. Most AVA-E commands can be entered and are transmitted to the remote AVA-E. This allows configuration and testing of the remote unit.

The following commands are not allowed in remote mode and, therefore, are not displayed on the remote Help menu: CR, CN, RTD and !R.

If the EXIT command is not issued, the connection will time out in 30 seconds and return to the local **AT YOUR COMMAND >>** prompt.

```
REMOTE COMMAND [EXIT to disconnect] >> EXIT
Disconnect remote AVA...
Remote AVA DISCONNECTED
AT YOUR COMMAND >>
```

---

## Time (TI)

---

This command displays the AVA-E up time. That is, the elapsed time since the unit was last reset.

---

## Repeat Last Command (\*)

---

To repeat the last command, simply press the \* key. This is handy for repeating screens of constantly changing data.

---

## Test Tools (TT)

---

```
Test Tools
-----
Monitor Data Port:
  RX/TX.....MR/MT
  RX/TX in HEX.....MRH/MTH
Show RS232.....SR
```

---

## Monitor Data Port RX/TX (MR/MT)

---

```
Monitor data port: RX - Press ESC-ESC to quit.MT
Monitor data port: RX TX - Press ESC-ESC to quit.
Stop port monitor
```

MR monitors data received on the network going out of the data port. MT monitors data coming into the data port being sent out the network port. Both commands can be active at the same time. The data on the screen will be tagged at [RX] or [TX] as it is displayed. Press the <Esc> key twice to exit the command.

---

## Monitor Data Port in HEX (MRH/MTH)

---

MRH and MTH work the same as MR and MT except the data are displayed in HEX.

## **Show RS232 (SR)**

---

```
Data Port RS232: RTS(8)-HI CTS(7)-HI DTR(3)-HI DCD(2)-HI DSR(1)-HI
```

This command displays the current state of the data port RS232 control leads.

## **Round Trip Delay (RTD)**

---

```
Measure Round Trip Delay...  
Round Trip Delay is 2 ms.
```

This command measures the round trip delay between the local and remote AVA-Es. The delay is rounded to the nearest 1ms and cannot be 0. Press the <Esc> key to exit the command.

## Chapter 4

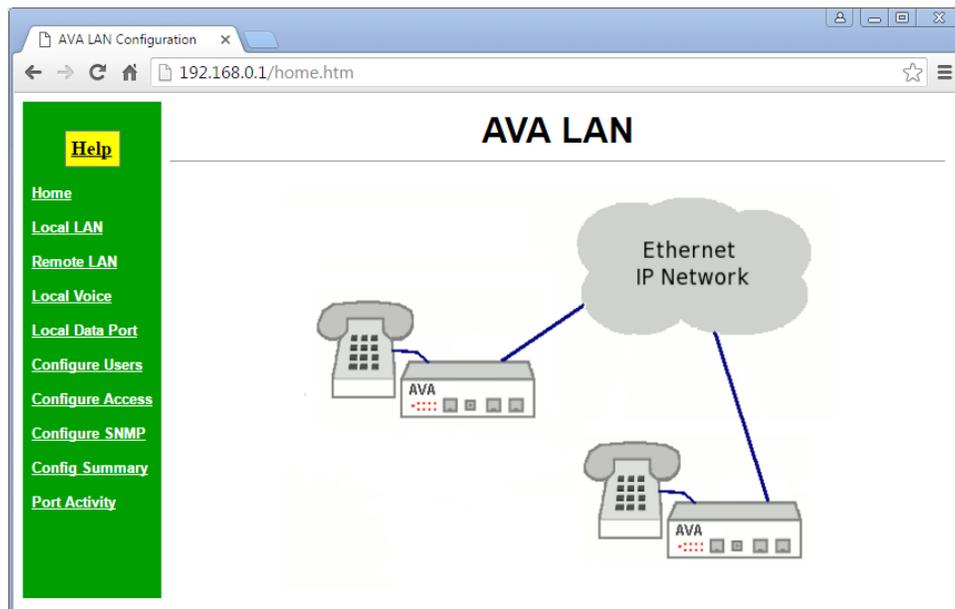
# Web Browser Configuration

*This Chapter describes how to configure the AVA-E via the LAN port using web forms.*

### Overview

The AVA-E is most commonly configured using forms displayed on a web browser. In this chapter, we illustrate all entry forms, and describe their use. Familiarity with IP and related information is required before you can configure any ethernet product. The workstation and AVA-E must have IP addresses on the same LAN subnet. If they don't yet, connect via the USB port to configure the AVA-E to reside on the subnet of your workstation.

All configuration screens are accessed from the main index screen shown below. They are divided into sections with only one layer of screens below the top level.

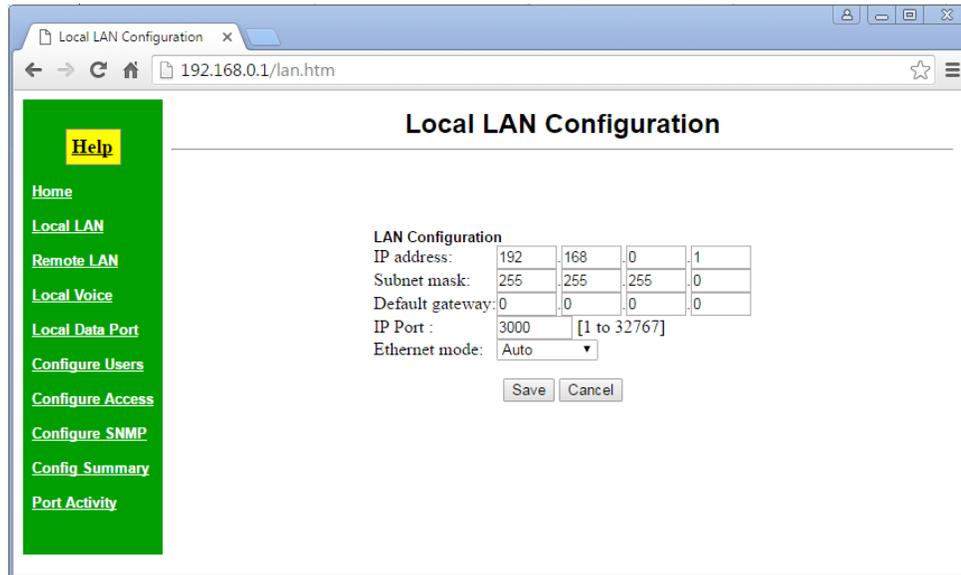


Main Screen

From this index, click on a menu keyword to open the appropriate screen. In this manual, screens are discussed in the order shown on the index screen.

Note that there is no menu selection for the **SYNC NETWORK** port: Configuration with the web forms assumes that the **LAN** port will be used for transporting data to another AVA-E. If the **SYNC NETWORK** port will be used instead, configuration must be done using one of the serial terminal methods described earlier.

## Local LAN



Local LAN Configuration Screen

The LAN interface must be configured correctly to match the network it's connected to.

### Fields

---

- IP Address  
The IP address of AVA-E on your LAN. The default IP Address is 192.168.0.1.
- Subnet Mask  
A subnet mask is a bit mask applied against the IP address. It specifies which portion of the IP address is the subnet identifier and which portion is the host identifier. For example, many subnets have a mask of 255.255.255.0. This means the first 24 bits of the address is the subnet identifier and the last 8 bits is the host identifier. ***This field is not used if DHCP Client has been enabled. The subnet mask will be assigned by the DHCP server.***
- Default Gateway  
The Gateway specifies the address of the gateway router on the local subnet. Packets destined for a host not on the local subnet are forwarded to the gateway router. If your LAN uses a router, enter the IP Address of the Router. Otherwise, leave this value set to 0.0.0.0. ***This field is not used if DHCP Client has been enabled. The DHCP server will assign the IP address.***
- IP Port  
Select any desired IP port. All AVA-E units that will communicate with each other in your application must use the same IP port.
- Ethernet Mode  
This option allows you to control the Ethernet speed and duplex. In **Auto** mode, the Ethernet controller will automatically negotiate the speed and half/full duplex with the connected device. This is the preferred setting. However, for compatibility reasons you may need to force operation to one of the other settings. Make sure the connected device supports the mode you select. Keep in mind that hubs do not support full-duplex operation.

### Notes

---

## Remote LAN

Remote LAN Configuration Screen

This is the IP address for each remote AVA-E this unit will communicate with. Up to 5 remote IP addresses can be stored. If you do not enter any remote IP addresses, this unit will transmit packets to the last IP address from which it received packets.

### Fields

- **ADD/DELETE IP Address**  
The IP address of an AVA-E on your LAN.
- **Port**  
Must use the same IP port as was entered in the **Local LAN** form.
- **Add / Delete**  
Select the operation to add a new address or delete an existing address.

### Notes

- More than one IP address should be used only in broadcast applications or with M-controlled E&M audio transmission.
- In a multiple-unit AVA E&M installations, going off-hook on one telephone will cause all the remote phones to ring. When the first remote is taken off-hook to answer the call, the other remote AVAs stop ringing, and only the two off-hook AVAs pass the voice.

For example, consider a network of three AVA-E units where each unit is configured with the IP addresses of the other two units. When telephone A goes off-hook, telephones B and C start ringing. If telephone B goes off-hook to answer, telephone C will stop ringing, and the voice call between A and B is established. Two-way voice is possible between any two telephones in this network.

## Local Voice

Local Voice Configuration

Help

Home

Local LAN

Remote LAN

Local Voice

Local Data Port

Configure Users

Configure Access

Configure SNMP

Config Summary

Port Activity

Voice Configuration

Voice Rate: 3600

Preamp Gain: +0 dB

Input Gain: -6 dB

Output Gain: -6 dB

Jitter Buffer: 140 [40 to 600ms]

Voice Input Options

Voice Input: FXO

FXS: Normal

E&M: Always ON

Local AVA ID

AVA ID : AVA1 [16 char max]

Save Cancel

Local Voice Configuration Screen

Voice configuration values must match the other AVA-E units with which it communicates. As with all voice telecommunication networks, there is no set rule for the various gain values: They are installation specific and are usually compromises to obtain the highest quality voice with adequate levels and without excessive echo.

### Fields

- **Voice Rate**  
Digitization rate for the audio to digital conversion. The local and remote AVA-E voice rate setting must be identical.
- **Preamp Gain**  
Set the audio preamp gain level. The default depends on the voice input.
- **Input Gain (-42 to +20 dB)**  
Set the audio input gain level. The actual audio input gain is the sum of Preamp Gain and Input Gain. The default depends upon the voice input.
- **Output Gain (-42 to +20 dB)**  
Set the audio output gain level. The default depends upon the voice input.
- **Jitter Buffer**  
The Jitter Buffer is a delay added to the audio sample to accommodate delays in the network. The default value is 140 ms. The value entered is converted to an integer multiple of 20 ms.
- **Voice Input**  
Select the AVA-E audio input. Available options are FXO, FXS, MIC-PTT, and E&M. *Some settings require internal jumper changes.*
- **FXS Options**  
Options are *Normal* and *Always off-hook*. When the FXS input is selected, this option forces the input off-hook continuously. Default is *Normal*, where off-hook is controlled by the connected telephone device.

- **E&M**  
When the E&M input is selected, this option enables the M input signal to control audio transmission when set to *M-control*. Default is *Always ON*, where E&M is always transmitting audio.
- **AVA ID**  
The ID name of the local AVA-E unit. It may be 16 characters maximum length.

## Notes

---

- Voice configuration values often require adjustment for best voice quality, adequate volume, and minimum echo. Jitter buffer adjustments are required to eliminate audio gaps or noise when packet transit times are inconsistent.

## Local Data Port

Local Data Port Configuration

Rate: 9600  
Parity: NONE  
Flow Control: NONE

Port Timing Options  
Idle Timeout : 10 [0 to 250ms]  
DCD to RXD Holdoff : 0 [1 to 250ms, 0=DCD ON]  
RXD to DCD Holdover : 2 [0 to 250ms]

Save Cancel

Local Data Port Configuration Screen

There is a single RS-232 asynchronous port on each AVA-E unit. Data sent to this port of the local AVA-E will be received at the corresponding port of the remote AVA-E, and vice-versa.

### Fields

- **Rate**  
Select the proper data rate. Valid options are 1200, 2400, 4800, 9600, 19,200, 38,400, and 57,600 bps. Default is 9600 bps.
- **Parity**  
Select the desired parity. Valid options are none, even, and odd. Default is NONE.
- **Flow Control**  
Select the desired flow control. Valid options are RTS, Xon/Xoff, and NONE. Default is NONE.
- **Idle Timeout**  
The Idle Timeout setting delays network transmission until an entire block is received from the terminal device. This insures data integrity and prevents fragmented blocks. Settings are from 0 to 250 ms. Default is 10ms. If changed from the default, this is normally configured to be 3 or 4 character times at the selected data rate.
- **DCD to RxD Holdoff**  
The DCD to RXD Holdoff can be set from 2 to 250ms. This is the time between Port DCD being asserted and data being sent out the port to the attached device. For example, if you are using a 202T modem off the data port, you may want to set the RXD holdoff to match the modem RTS/CTS delay and use the AVA-E DCD signal to drive the modem RTS signal. When set to 0, DCD is forced ON.
- **RXD to DCD Holdover**  
If DCD is not forced on, the RXD to DCD Holdover delay may be set to a value between 0 and 250ms. This will hold port DCD on for the designated time after the port buffer empties. This can help insure that all data gets to the attached device.

## **Notes**

---

- In most installations, default values are adequate if the asynchronous device operates at 9600 bps.

## Configure Users

The screenshot shows a web browser window titled "User Configuration" with the address bar displaying "192.168.0.1/user.htm". The page features a green sidebar on the left with a "Help" button and several navigation links: Home, Local LAN, Remote LAN, Local Voice, Local Data Port, Configure Users (which is highlighted), Configure Access, Configure SNMP, Config Summary, and Port Activity. The main content area is titled "User Configuration" and contains three user configuration sections: "Admin User", "User 1", and "User 2". Each section includes input fields for "Username", "Password", and "Verify Password". At the bottom of the form are "Save" and "Cancel" buttons.

Configure Users Configuration Screen

User names and passwords may be used to restrict administrative access to the device. Three users are defined. One user is considered the Administrative user and has full access to the device. The other two users are restricted users and may only view the configuration. If all Usernames and Passwords are blank, this feature is disabled.

### Fields

---

- Username  
The username may consist of 1 to 8 printable ASCII characters. A space character may be used if it is not the first or last character of the string.
- Password  
Configure a password for the user. The password may contain any printable ASCII characters.
- Verify Password  
The password must be entered twice to verify it was entered correctly.

### Notes

---

- This unit uses HTTP basic authentication. It is not a high security device.

## Configure Access

Access Configuration

Allowed IP Address [1]: 0 . 0 . 0 . 0  
Allowed IP Address [2]: 0 . 0 . 0 . 0  
Allowed IP Address [3]: 0 . 0 . 0 . 0  
Allowed IP Address [4]: 0 . 0 . 0 . 0

Web Server:  Enabled  Disabled  
Telnet Server:  Enabled  Disabled  
SNMP Agent:  Enabled  Disabled

Save Cancel

Access Configuration Screen

Access to AVA-E configuration may be restricted by IP address.

### Fields

- Allowed IP Address  
Enter the IP addresses of the workstations which you wish to have access to the device. If these are left at the default of 0.0.0.0, all workstations have access.
- Web Server  
Enable or disable the web server configuration screens.
- Telnet Server  
Enable or disable the telnet configuration server.
- SNMP Agent  
Enable or disable the SNMP agent.

### Notes

-

## Configure SNMP

SNMP Configuration

Help

Home

Local LAN

Remote LAN

Local Voice

Local Data Port

Configure Users

Configure Access

Configure SNMP

Config Summary

Port Activity

Contact Person : Supervisor

Device Name : AVA003E7B

Physical Location : Head Office

SNMP Community : public

Save Cancel

SNMP Configuration Screen

These are text fields, commonly used in SNMP (Simple Network Management Protocol) programs to identify this device when browsing the network. These values have no effect on AVA-E's operation and the limited SNMP functionality is meant only to provide an indication that the AVA-E unit is on-line.

### Fields

---

- **Contact Person**  
A text field that can be used to store the name of the person responsible for this AVA-E unit.
- **Device Name**  
A descriptive name for this AVA-E
- **Physical Location**  
This field can be used to store the location of this AVA-E unit.
- **SNMP Community**  
This field is used to set the SNMP community name. Only one community name is supported. Access is limited to read-only.

### Notes

---

- Limited SNMP functionality is provided to allow SNMP managers to determine the AVA-E is active.

## Configure Summary

**AVA Configuration Summary**

**LAN Configuration**

IP Address	192.168.0.1
Network Mask	255.255.255.0
Gateway IP Address	0.0.0.0
IP Port	3000
Ethernet Mode	Auto

**Remote LAN Address**

1	192.168.0.2:3000
---	------------------

**SNMP Configuration**

Contact Person	Supervisor
Device Name	AVA003E7B
Physical Location	Head Office
SNMP Community	public

**Manager Access Rights**

IP Address [1]	0.0.0.0
IP Address [2]	0.0.0.0
IP Address [3]	0.0.0.0
IP Address [4]	0.0.0.0

**Voice Configuration**

Voice Rate	3600
Preamp Gain	+0 dB
Input Gain	-6 dB
Output Gain	-6 dB
Jitter Buffer	140 ms
Voice Input	FXO

**Data Port Configuration**

Port Rate	9600
Parity	NONE
Flow Control	NONE
Idle Timeout	10 ms
DCD to RXD Holdoff	0 ms

**AVA Firmware**

AVA ID	AVA1
AVA Firmware	V2.4
LAN Firmware	V1.2

Restore LAN Defaults   Restore Voice/Data Defaults   RESET AVA

### Configuration Summary

This screen displays all configuration values of the AVA-E. Click buttons provide a method to reset the unit to defaults.

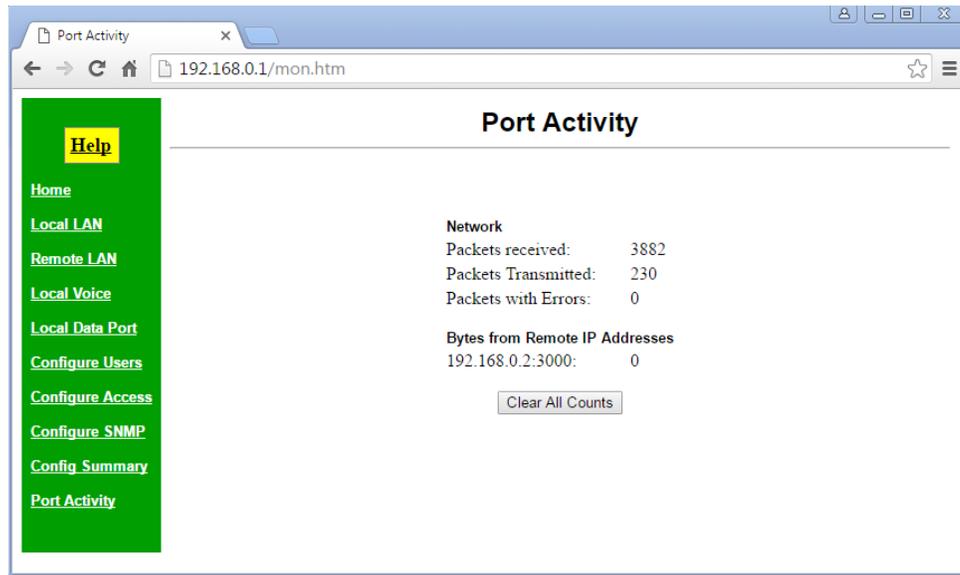
### Fields

- **Display Fields**  
The entire configuration is visible on this screen. Fields are described in the appropriate configuration section.
- **Restore LAN Defaults**  
Clicking the *Restore LAN Defaults* button will restore the LAN default settings.
- **Restore Voice /Data Defaults**  
Clicking this button will restore the Voice and Data default settings.
- **RESET AVA**  
Clicking this button will reset the AVA-E. No settings are changed. This is equivalent to a power cycle.

### Notes

.

## Port Activity



Port Activity Screen

This screen displays counters for packets and bytes received over the network.

### Fields

---

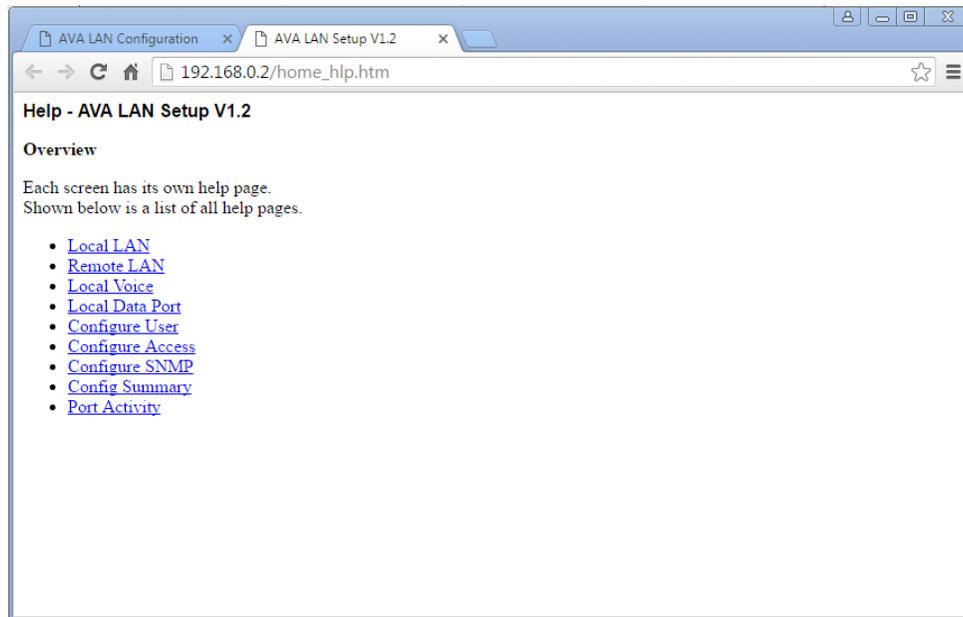
- **Packets Received**  
The number of packets received by AVA-E from the ethernet interface.
- **Packets Transmitted**  
The number of packets transmitted by AVA-E to the ethernet interface
- **Packets with errors**  
Number of packets transmitted or received by the AVA-E through the LAN connection that contained errors.
- **Bytes from Remote IP Addresses**  
The number of bytes received by AVA-E from the listed IP addresses.

### Notes

---

- The values shown include management packets as well as data or payload packets. Even with no voice or data transmission, the counters increment with web browser screen refresh transmissions.

## Help Screen



### Help Menu Screen

There is a context sensitive help screen for each configuration screen available by clicking on the HELP button on individual configuration screens. Clicking the HELP button on the main menu screen returns this help menu screen.

### Fields

---

- Hot links  
Links to each configuration section help screen.

### Notes

---

-

## Chapter 5

# Troubleshooting

*This chapter outlines some problems that may occur during installation or operation and some possible solutions to them.*

If you follow the suggested troubleshooting steps and the unit still does not function properly, please contact your dealer or DCB for further advice.

### Hardware Problems

**Before anything else, check that all cables are wired correctly and properly connected.**

**P:** All the LEDs are off.

**S:** Check the power supply or power connection.

**P:** When using 10/100/1000Base-T cabling, the unit does not work.

**S:** Check the switch or hub's link LED for the port to which the AVA-E is connected. If it is off, make sure the network cable between the AVA-E and hub is in good condition. Note that either a straight-through or crossover ethernet cable may be used.

### Can't Connect via the LAN

**P:** Can't connect with a Web Browser.

**S:** Check the following:

- Insure that you are addressing the AVA-E correctly. Check IP addressing.
- Start troubleshooting from a known state. Power all equipment OFF and ON to reboot.
- Is a proper IP address configured in the PC?
- "Ping" the unit to see if it responds. From the Windows command prompt or "Run" dialog box, use the command:

```
ping IP_Address
```

Where `IP_Address` is the IP Address of the unit (e.g. `ping 192.168.0.1`). If it does not respond, then check all LAN connections. If the LAN connection are OK, the problem is in the LAN addresses or routing **The most common problem cause is incorrect IP address configurations. Make sure the workstation and AVA-E have compatible IP addresses.**

- It may be that your "ARP table" contains invalid entries. You can clear the ARP table by rebooting, or, on Windows, by typing the following command at the command prompt or *Run* dialog box: `ARP * -d`. **This is a common problem with test-bench setups.**
- In some cases, "smart" hubs and switches must be power-cycled to clear their internal ARP cache. **This is often a problem on test bench setups where IP addresses are moved between different equipment or a unit is moved between ethernet switch receptacles.**

---

## Voice Problems

**Each installation is unique. There are configurable voice parameters that can be tuned to maximize the quality of transmitted audio. Remember, most audio configuration values are compromises, so some experimentation may be required to obtain optimum settings.**

**P:** Too much echo.

**S:** On any link with delay that gets above 100 ms or so, the 2-wire to 4-wire conversion echo becomes noticeable. The AVA-E has echo cancellation, but with that much delay, one has to be more picky about setting the voice transmit and receive levels. "That much delay" is the digitization of the AVA-E plus the transmission path turn around. The transmission path delay is likely the largest component of the delay.

The same issue comes up with all VOIP applications. One has to work with the levels to get the echo down to where it is either not heard any more or so low that it is ignored by the caller.

Excessive echo is usually present when audio levels are higher than need be. Lower the levels one step at a time. Eventually there should be a good talk level found where the echo fades far into the background, but the talk level is sufficient for normal conversation.

**P:** E&M Interface Control Lead Problems

**S:** The "M" lead is the input on pin 7 of the E&M interface. With a -48 VDC in on pin 7, with the + side of the 48 volts on pin 8, ground of the RJ45 interface, the M lead relay is activated. At the far end AVA-E, pin 2, the "E" lead relay closes. If testing with a VOM between pin 2, the E lead, and pin 1, ground, it shows that the circuit between 2 and 1 goes from open to closed. The input side, M lead, is a mechanical relay. The E lead output is solid state.

The M lead relay is 48 volts. It is activated by a voltage of at least 38 volts. The holding voltage is 4 volts or more. There are a number of relays available at different voltages available as factory options, such as 24 volts, 12 volts, 9 volts, 6 volts, 5 volts.

## Other Problems

**P:** Can't run the initial configuration program using a serial or USB cable connection.

**S:** Check that:

- Power is available and the leftmost front panel LED is on.
- For the USB connection, if a "Driver not found" error occurs, download the latest USB drivers for the PC, as noted in the **Configuration Software Requirements** section.
- The port settings in the terminal emulation program are set properly: If using the USB interface, the settings are 57.6kbps, 8-N-1, but on the **ASYNC DATA** port, the settings are 9600, 8-N-1.
- With USB connections, it's common for Windows to assign a new COM: port number with each new start up or when plugging the USB cable into the PC.
- If using the **ASYNC DATA** port, verify that Switch 2 on the DIP switch is in the Up position.
- The most common problems causing this symptom are incorrect RS-232 wiring or the terminal emulation program not operating correctly.

## How To Return To Factory Defaults

- If the browser interface is being used, click the "**Restore LAN Defaults**" and the "**Restore Voice/Data Defaults**" buttons on the *Configuration Summary* screen.
- If using telnet (port 8000), select *option 7*, "**Reset Configuration to Default**".
- If using the USB serial connection or serial configuration via the **ASYNC DATA** port, the *Load Defaults* command is **!R**.
- Removing the internal jumper on J5 (normally on pins 1 and 2) will force the unit to factory default when it is reset or power cycled.

## Chapter 6

# Interfaces and Cables

*This chapter describes electrical interfaces and commonly used cable connections.*

## Cables

Commonly used cable connections.

### Ethernet Cables

Use any commercially available 10/100BaseT cable. If using 100BaseT or 1000BaseT, an appropriately rated cable is required.

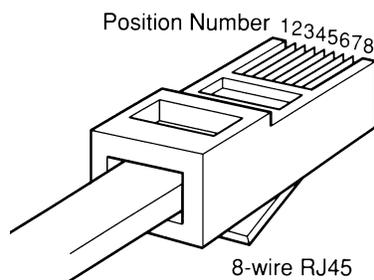
### Ethernet Crossover Cable

A crossover cable may be constructed to allow the ethernet port to directly connect to a PC or equivalent without using a hub or switch.

Use the following pinout to build an ethernet crossover cable:

AVA		PC
RJ-45		RJ-45
PIN		PIN
1	-	3
2	-	6
3	-	1
6	-	2

### RJ45 Pin Reference



RJ45 Plug Positions

## Port Interface

### Network Port (RJ45)

---

<u>Pin</u>	<u>Signal</u>	<u>In/Out</u>
1	Receive Clock	IN
2	Transmit Clock	IN
3	Data Carrier Detect	IN
4	Signal Ground	
5	Transmit Data	OUT
6	Receive Data	IN
7	Request to Send	OUT
8	Clear to Send	IN

### ASYNC Data Port (RJ45)

---

<u>Pin</u>	<u>Signal</u>	<u>In/Out</u>
1	Data Set Ready	OUT
2	Data Carrier Detect	OUT
3	Data Terminal Ready	IN
4	Signal Ground	
5	Receive Data	OUT
6	Transmit Data	IN
7	Clear to Send	OUT
8	Request to Send	IN

### LAN Port

---

<u>Pin</u>	<u>Signal</u>	<u>In/Out</u>
1	Data (Tx+)	OUT
2	Data (Tx-)	OUT
3	Data (Rx+)	IN
6	Data (Rx-)	IN

---

## Voice Port Interfaces

### FXS/FXO (RJ11 600 ohm)

---

<u>Pin</u>	<u>Signal</u>
3	Tip
4	Ring

### E&M (RJ45)

---

Type 1, Side A, 600 ohm

<u>Pin</u>	<u>Signal</u>	<u>In/Out</u>
1	E&M Ground	
2	E lead	OUT
3	Audio	IN
4	Audio	OUT
5	Audio	OUT
6	Audio	IN
7	M lead	IN
8	E&M Ground	

### MIC/PTT (RJ45)

---

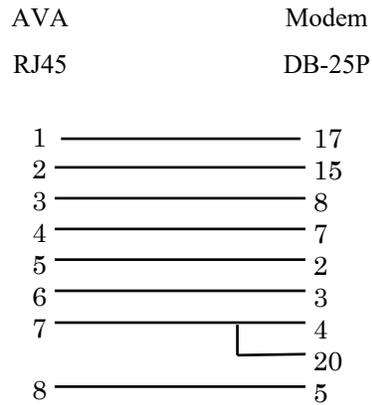
<u>Pin</u>	<u>Signal</u>
1	Signal Ground
2	Signal Ground
3	Not Used
4	Audio Ground
5	Not Used
6	Mic Audio In
7	Not Used
8	PTT In

## Cables

### Network Port to Modem

---

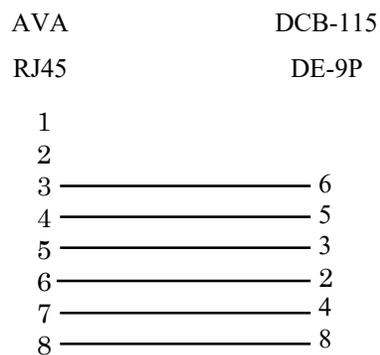
A two foot composite to modem cable is included with each AVA-E. The pinout is as follows:



### Network Port to Wireless Modem

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This cables connects the AVA-E network port to a DCB wireless modem. (9802040)



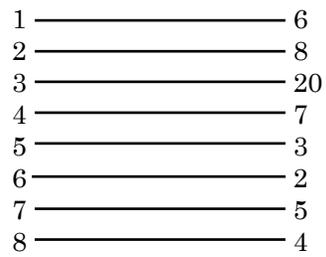
## Data Port to Async Device

---

### Configured as DTE

AVA                      Computer

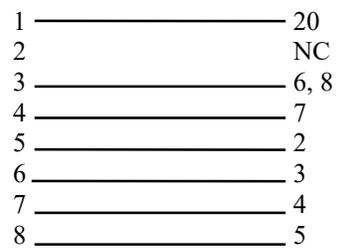
RJ45                     DB-25



### Configured as DCE

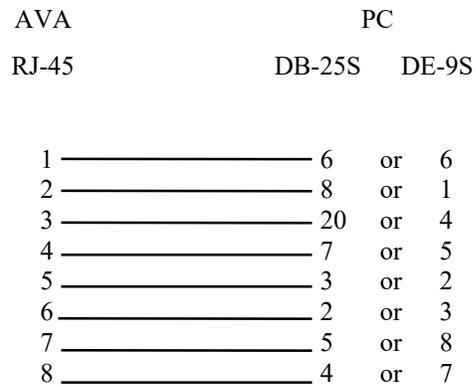
AVA                      Computer

RJ-45                    DB-25



## Data Port to a PC Com Port

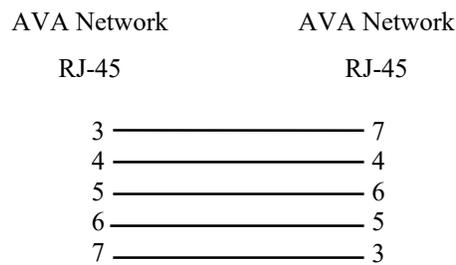
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## Crossover Cable

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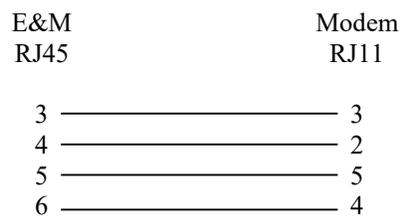
**This is for back-to-back bench testing using the asynchronous network port.**



## E&M Port to Analog Modem

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E&M Port to Analog Modem (PCM or ADPCM)



# Appendix A

## Specifications

### AVA-E Specifications

- Data Port (“ASYNC DATA”)

Port Speeds (Asynchronous only)

300, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, or Custom bps

Port Rate Selection

Selected through setup port.

Data Format

10 bits/character, 1 start, 1 stop, 8 data (including parity)

Interface

CCITT V.24, RS-232D, implemented in RJ-45, 8 position connectors. (RS-561 standard physical pin-out used on RJ-45 connectors)

- Serial Network Port (“SYNC NETWORK”)

Full Duplex

Speed

Synchronous up to 256 Kbps

Asynchronous from 4800 to 230,400 bps

Interface

RS-232D, implemented in RJ-45, 8 position connector

- Ethernet Port (“LAN”)

10/100BaseT Autosensing or selectable

■ Voice Interface (“**FXS/FXO**” or “**E&M**” or “**MIC**”)

Type: FXS, FXO, E&M or Push-to-Talk

Rate: 2250 – 9600 bps

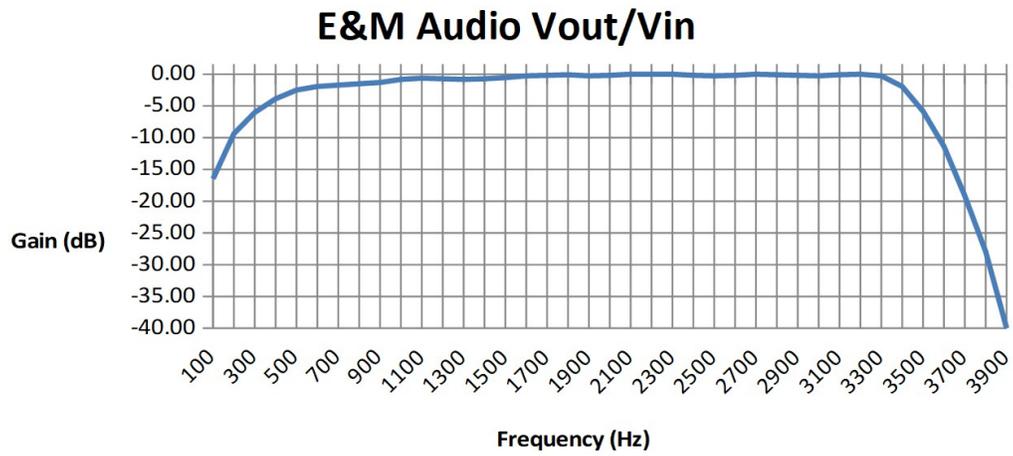
Preamp Gain: 0, +6, +12 or +24 dB

Input Gain: –42 to +20 dB

Output Gain: –42 to +20 dB

Jitter delay: 40 to 600 ms (20ms increments)

E&M Audio Passband:



■ Audio Interface (“**Audio**”)

2-wire terminal block for connection of 8 ohm speaker