Aztec FMB80 RDS Encoder SETUP

2008/05

**DESCRIPTION**

Serial – RS-232/V.24
Ethernet – TCP/IP
Ethernet – UDP/IP

The Aztec FMB80 RDS Encoder must be configured properly before use with PADbridge.
It is very important that the unit be loaded with the most current firmware, especially when using dynamic RDS, since the most current firmware writes dynamic RDS entries to RAM rather than FlashRAM, which will quickly lower the life-cycle of the FlashRAM, causing erratic RDS display and eventual failure. This will also insure that the Aztec FMB80 features are properly supported.

Proper initialization will insure connectivity and that after a power cycle, the RDS Encoder will not broadcast incorrect embarrassing data.

PADbridge can send data to the Aztec FMB80 either through a Serial or Ethernet connection. If Serial is used, all configuration and initialization is performed through COM0, the Serial administration port. COM0 through COM2 can be used to receive RDS data from PADbridge. If Ethernet is used, configuration and initialization is performed through either the Serial or Ethernet connection, and data is received from PADbridge using either TCP/IP or UDP/IP.

**Configuration** – Using Serial

Modem Cable – DTE-DCE – Straight-Thru – Male to Female DB-9
COM0 – DO NOT USE any other COM port for Configuration Administration.
9600-N-8-1 – No Flow Control
A terminal program such as HyperTerminal or PuTTY can be used.
For Serial operation using COM0, only the Initialization section needs to be completed.
For Serial operation using COM1/2, the Serial Configuration section also needs to be completed.
For Serial operation, it is best to use COM1/2, leaving COM0 open for Administration.

Initialize through Serial connection:

1. Using a computer, configure a terminal application configured for 9600-N-8-1 to the Serial port.
2. Connect a Modem Serial cable from the computer Serial port to Aztec FMB80 COM0.
3. Initialize as described in Initialization section.

**Configuration** – Using Ethernet

For Ethernet connectivity, the IP parameters must be set.
Although many of the Aztec FMB80 parameters may be configured using the HTTP Browser Interface, the TCP/IP and/or UDP/IP parameters used by PADbridge to communicate real-time RDS data are not configurable through this interface. Therefore, a terminal program such as HyperTerminal, PuTTY, or Telnet must be used. Also, once the Aztec FMB80 is properly configured for TCP/IP connectivity, all configuration parameters may be administered through HyperTerminal, PuTTY, or Telnet.
For Ethernet operation, Initialization, IP Configuration, TCP/IP Configuration, and/or UDP/IP Configuration sections must be completed.

Configure IP Address through Serial connection:

1. Configure a terminal application to 9600-N-8-1.
2. Connect a Null-Modem Serial cable from the active computer Serial port to Aztec FMB80 COM0.
3. Configure TCP/IP as below.
4. All other configuration and initialization can be performed with this connection as well.

Configure IP Address by ARP request:

This method is useful if a null-modem cable is not available, or the computer used to configure the Aztec FMB80 is not at the same physical location.

Caution: This method only works if the Aztec FMB80 is on the same sub-net as the computer that configures it. A PING should be sent from the computer used to configure the Aztec FMB80 to another known active IP Address on the same sub-net.

1. Locate the serial number of the Aztec FMB80. This is the MAC address, and is in the form: `XX-XX-XX` or 6 numbers `00-90-3F-XX-XX-XX`.
2. Open a Windows Command Prompt and type:
   `arp -s <desired IP Address> <00-90-3F-XX-XX-XX>`
   Example: `arp -s 192.168.0.201 00-90-3F-00-00-01`
3. Power the Aztec FMB80 ON and wait about 15 seconds. If the Aztec FMB80 was already ON, power it OFF, then ON again.
4. Within the minute after powering the Aztec FMB80 ON, send a PING from the computer to the desired IP Address:
   `ping <desired IP Address>`
   Example: `ping 192.168.0.201`
5. A message informing you that the PING command was successfully executed will be sent by the system. The response of the first PING to the Aztec FMB80 always takes a few seconds to appear.

## Initialization

| | |
|---|---|
| WELCOME=OFF↵ | Disable Welcome Message (COM0 Only) |
| DATE=DD/MM/YYYY↵ | Configure Date |
| TIME=HH:MM:SS↵ | Configure Time UTC |
| CT.OFFSET=x↵ | Configure Time Offset (-24 to 24) (-8 for US PST) |
| CT=x↵ | Broadcast Time (0) Disable / (1) Enable |
| PI= xxxx↵ | Program Identification (PI) |
| PS=xxxxxxxx↵ | Default Program Source (PS) (Call Letters or Station Name) |
| RT=↵ | Clear Radio Text (RT) |
| PS_RT_delay=n | PS and RT Delay (n = 0 – 200) seconds (optional) |
| PTY=n↵ | Default Program Type (PTY)<br>See PTY Table – DO NOT USE 30 or 31!!!! |
| | |
| WELCOME?↵ | Returns Welcome Message State |
| DATE?↵ | Returns DATE |
| TIME?↵ | Returns TIME |
| CT.OFFSET?↵ | Returns Time Offset |
| CT?↵ | Returns Broadcast Time State |
| PS?↵ | Returns Program Source (PS) |
| RT?↵ | Returns Radio Text (RT) |
| PTY?↵ | Returns Program Type (PTY) |

## Serial Configuration RS-232 (optional)

| | |
|---|---|
| COM1.SETTINGS=9600,N,8,1↵ | Configure COM1 Port |
| COM1.PROTOCOL=ASCII↵ | Configure COM1 Protocol |
| COM2.SETTINGS=9600,N,8,1↵ | Configure COM2 Port |
| COM2.PROTOCOL=ASCII↵ | Configure COM2 Protocol |

## Ethernet IP Configuration

| | |
|---|---|
| IP=xxx.xxx.xxx.xxx↵ | IP Address |
| MASK=xxx.xxx.xxx.xxx↵ | Subnet |
| GATEWAY=xxx.xxx.xxx.xxx↵ | Gateway |
| MTU=1500↵ | MTU (Optional) Reduce to 1000 or 500 for heavily loaded or saturated networks to prevent packet fragmentation and data routing delays. |
| RESET↵ | Reset – Must be issued for IP parameters to become active. *Make sure the IP parameters are valid before sending RESET, failing which, access to the unit will NOT be possible on the next connection attempt!* |

After Reset

| | |
|---|---|
| ?NETWORK↵ | Returns ALL NETWORK parameters for verification. |
| HELP.NETWORK↵ | Returns Network Parameter Help |

## Ethernet TCP/IP Configuration

TCP is preferred for reliable Ethernet connectivity, especially on low bandwidth, busy, and/or saturated networks.

By default, the Aztec FMB80 uses Port 23 (Telnet) for TCP/IP connectivity from PADbridge.
No further configuration is necessary for Port 23 TCP operation.

ONLY Ports 5401-5499 may be configured for TCP operation.
It is possible to configure Ports 5401-5405 for both TCP *and* UDP operation, and although unnecessary, either TCP or UDP should be used.
Only one port is required for PADbridge.

| | |
|---|---|
| `interpret1.out=tcp1↵` | Route Interpreter to TCP Port 5401 |
| `tcp1.out=interpret1↵` | Route TCP Port 5401 to Interpreter |
| . | |
| . | |
| . | |
| `interpret99.out=tcp99↵` | Route Interpreter to TCP Port 5499 |
| `tcp99.out=interpret99↵` | Route TCP Port 5499 to Interpreter |

| | |
|---|---|
| `?TCP↵` | Returns TCP/IP Parameters |
| `?interpret↵` | Returns Interpret Parameters |
| `interpret(n)x.out=0↵` | Clear/Disable Route Interpreter to TCP Port (n) |
| `tcp(n).out=0↵` | Clear/Disable Route TCP Port (n) to Interpreter |

```
SCH.ADD=*;*;*;*;3;0;0;*;*;RESET
SCH_ENABLED=1
SCH.SAVE
```
Reset FMB-80 at 0300 (Workaround FMB80 TCP-IP Bug)

## Authentication (Optional) – Under Development

By default, Authentication is OFF, and PADbridge does NOT require a User or Password for FMB80.
If Authentication is required, Users and Passwords may be entered.
Note that Authentication is NOT encrypted, thus FMB80 access security is minimum.

| | |
|---|---|
| `USER1=user,password,S↵` | Creates a User Profile for PADbridge |
| `USER?↵` | Returns Current User Rights |
| `?USERS↵` | Returns User Profiles |
| `SECURE=ON↵` | Authentication – ON \| OFF |
| `SECURE?↵` | Returns Current Authentication State |

**Ethernet UDP/IP Configuration**

UDP should only be used with uni-directional point to point or multicast networks that have adequate bandwidth to prevent packet loss. Using UDP on low bandwidth or saturated networks will result in packet loss and unreliable operation.

ANY available UDP Port may be used. Ports 5401-5405 are default examples.

| | |
|---|---|
| `INIT.UDP↵` | Init UDP Server to Default Parameters – Clear UDP Parameters |
| `UDP1.PORT=5401↵` | Configure UDP IP Port |
| `UDP1.PROTOCOL=ASCII↵` | Configure Protocol |
| `UDP1,MODE=UNI↵` | Configure Mode |
| `UDP1.FILTER=<x.x.x.x>↵` | Configure UDP Filter for PADbridge Server Source IP Address |
| `UDP1.USERLEVEL=SUPER↵` | Configure UDP User Level – RDS Encoder Write Privileges |

| | |
|---|---|
| `?UDP↵` | Returns UDP/IP Parameters |
| `HELP.UDP↵` | Returns UDP/IP Parameter Help |

| | |
|---|---|
| `UDP(n).PORT=0↵` | Clear/Disable UDP IP Port |

## Program Type (PTY)

| PTY | Program Type – US | Program Type – EU |
|---|---|---|
| 0 | None | None |
| 1 | News | News |
| 2 | Information | Current Affairs |
| 3 | Sports | Information |
| 4 | Talk | Sports |
| 5 | Rock | Education |
| 6 | Classic Rock | Drama |
| 7 | Adult Hit Music | Culture |
| 8 | Soft Rock Music | Science |
| 9 | Top 40 Music | Varied |
| 10 | Country Music | Pop Music |
| 11 | Oldies Music | Rock Music |
| 12 | Soft Music | Easy Listening Music |
| 13 | Nostalgia Music | Light Classics Music |
| 14 | Jazz | Serious Classics Music |
| 15 | Classical Music | Other Music |
| 16 | Rhythm and Blues Music | Weather |
| 17 | Soft R and B Music | Finance |
| 18 | Foreign Language | Children's Programs |
| 19 | Religious Music | Social Affairs |
| 20 | Religious Talk | Religion |
| 21 | Personality | Phone-In |
| 22 | Public Non-Commercial | Travel |
| 23 | College | Leisure |
| 24 | (unassigned) | Jazz Music |
| 25 | (unassigned) | Country Music |
| 26 | (unassigned) | National Music |
| 27 | (unassigned) | Oldies Music |
| 28 | (unassigned) | Folk Music |
| 29 | Weather | Documentary |
| 30 | Emergency Test | Alarm Test |
| 31 | Emergency! | Alarm! |