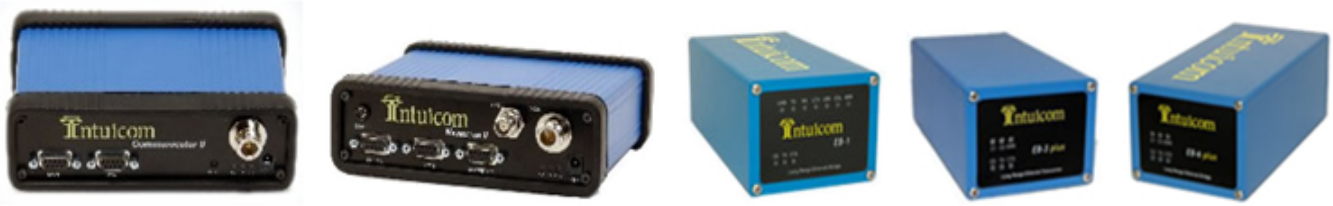
Intuicom Radio Modems and Networking

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NOTE: The outdated and offensive "master-slave" terminology has been replaced with "Access point (AP) - Station/Endpoint (STA)" in all instances, but will still remain in the configuration software when implemented

How-tos

- How to configure an Intuicom wireless Ethernet bridge using CommPro software
- How to run diagnostics on Intuicom ethernet bridges using CommPro
- How to load firmware onto an Intuicom EB-1 ethernet bridge
- How to upgrade to Intuicom firmware Rev. 5.80, 2001 (for modems with serial number prefixes of 57x, 60x, or 9xx)

Software

The most recent CommPro software includes all the utilities, including diagnostics, previously separated into different software programs.

- CommPro 1.1.11 *(to configure radios and run diagnostics)*
  - SetupIntuicomCommPro_ver_1.1.11.msi
  - dotnetfx.exe
  - System Requirements.htm
- Intuicom EB6+ Discovery Tool *(to automatically find remote radios if you don't know their IPs)*

    - DiscoveryTool.exe
- RF Diagnostics for Linux
    - RF_diag4linux.tar

Firmware

- EB-1 firmware 2.64
    - 2.64.zip
- EB-1 firmware 2.54
    - 2.54.zip
- Firmware 5.82
    - REV582.EXE
- Firmware 5.80, 2001
    - Rev580.zip

Documentation

- Intuicom DIO Transceiver User Guide, Rev. 1.0a, 2006 (.pdf)
- Intuicom Navigator II User Guide Rev. 1.0f, 2006 (.pdf)
- Intuicom Nav-Link Server v4.0 User Guide, Revision 4.0a, 2005 (.pdf)
- Intuicom Navigator IIE User Guide Rev. 1.0b, 2004 (.pdf)
- Intuicom Communicator II User Guide Rev. 1.0d, 2004 (.pdf)
- Intuicom Wireless Ethernet Bridge Addendum, Revision 2.03, 2003 (.pdf) (Addendum to the Intuicom Communicator II User Guide)
- Intuicom Communicator II User Guide Rev. 1.0c, 2003 (.pdf)
- Intuicom Application Note: Synchronizing Collocated Masters (Multi-Master Sync Mode), #5412, July 27, 2002 (.pdf)

Datasheets

- Intuicom DIO Wireless Transceiver datasheet (.pdf)
- Intuicom Navigator II datasheet (.pdf)
- Intuicom Communicator II datasheet (.pdf)
- Intuicom EB-6 datasheet (.pdf)
- Intuicom EB-1 datasheet (.pdf)
- Intuicom CommPro software datasheet (.pdf)

Sample Configuration Files

- Sample access point configuration, no repeater
    - generic_AP_no_rptr.irc
- Sample enpoint configuration, no repeater
    - generic_STA_no_rptr.irc
- Sample access point configuration, with repeater
    - generic_AP_w_rptr.irc
- Sample endpoint configuration, with repeater
    - generic_STA_w_rptr.irc
- Sample repeater configuration
    - generic_rptr.irc

Network notes

- Avoid the use of omni antennas as much as possible. Wide beam yagis are preferred.
- In a dense network, Subnet ID's should be used to force endpoints to only communicate with repeaters on the same Subnet.

- Endpoints/repeaters with different Subnet ID’s can still step on each other. It is therefore recommended that endpoints/repeaters in a dense network be programmed to operate on different Frequency Keys as well as different Subnet ID’s.

- When programming a repeater to use different Frequency Keys, the repeater will still listen on the access point’s FK and will talk on the programmed FK.

- In areas of high RF interference, enabling "high noise" mode can sometimes increase download speeds.

- When remotely reconfiguring radios using CommPro, change only one parameter at a time, then reconnect and change the others. For example, change all subnet IDs in the network, then go back through and change all NetIDs, etc.

- For sites with co-located endpoint and repeater radios, the power setting on the endpoint should be turned down and an external antenna should still be used (e.g. 3dB bull antenna). For sites using metal enclosures, the endpoint antenna should be mounted externally and be equipped with a ground plane.

- When testing radios in the lab, turn their power settings all the way down and use a low gain external antenna, like a “rubber duck” antenna.

- Recommended hardware accessories:

    - Cavity filter EBF-900

    - Rubber duck antenna

    - Bull antenna

- In point-to-point (PTP) mode, the access point’s settings for everything except power override the endpoint’s. To convince yourself, try changing e.g. the max packet size on just the access point.

Radio Q&A

What is the radio type and transmission frequency?

- The radio is spread spectrum radio in the 902-928 MHz ISM band (less than 1 W effective radiated power (EFRP)). This is an unlicensed band. We divide this range into 112 channels and hop among them. It is not direct sequence. The radio is manufactured by Intuicom, the RF board is from Freewave.

Do we use a cyclic transmission schedule in the Plate Boundary Observatory?

- For the most part yes - we download a 2 MB data file once a day. The time varies but is usually 0-2 hours past 00 UTC. It takes less than ten minutes. We also collect very small packets (<100 bytes) at various intervals throughout the day which take milliseconds for state of health information. Again the schedule varies, but is usually every 6-10 minutes.

Online URL: https://kb.unavco.org/article/intuicom-radio-modems-and-networking-114.html