

Yaesu System Fusion & Wires-X

Seamless Digital and Analog Communication

What is Yaesu System Fusion?

Developed by Yaesu Musen Co. Ltd.

Key Concept: AMS (Automatic Mode Select)

- Radios automatically switch between Analog FM and Digital C4FM.
- Ensures compatibility with both analog and digital users on the same frequency.

Digital Modulation: C4FM (4-level FSK)

- Efficient and robust digital voice encoding.

Purpose: To provide clear digital voice communication while maintaining backward compatibility with existing analog FM systems.

C4FM Digital Modes

System Fusion utilizes several C4FM digital modes:

- **Voice Full Rate (V/FR):** High-quality voice, uses the full 12.5 kHz bandwidth.
- **Voice Narrow (V/N):** Voice with error correction, uses half the bandwidth, allowing for data on the other half.
- **Data Full Rate (D/FR):** High-speed data, uses the full 12.5 kHz bandwidth.
- **Data Narrow (D/N):** Data with error correction, uses half the bandwidth.

Yaesu System Fusion Equipment

Yaesu System Fusion Radios:

- **Handhelds:** FT-70DR, FT5DR, FT3DR
- **Mobiles:** FTM-100DR, FTM-300DR, FTM-400XDR, FTM-500DR
- **Repeaters:** DR-1X, DR-2X (often run in AMS mode)

Hotspots:

- Multi-mode digital hotspots (e.g., Pi-Star, OpenSPOT) can support C4FM.
- Allow you to connect your Fusion radio to the Wires-X network via your home internet, even without a local repeater.

Introduction to Wires-X

Wide-coverage Internet Repeater Enhancement System - X

Purpose: An internet-based linking protocol developed by Yaesu to connect System Fusion radios, repeaters, and nodes worldwide.

Connectivity:

- Connects individual Hams (via HRI-200 Box or PC-connected radios)
- Connects System Fusion repeaters
- Connects to "Rooms" and "Nodes"

How Wires-X Works

Nodes: An amateur radio station or repeater connected to the internet running Wires-X software. This is your entry point to the network.

Rooms: Virtual meeting places on the Wires-X network. Users connect their node to a specific room to join a group conversation.

HRI-200 Interface: A dedicated Yaesu hardware interface that connects a System Fusion radio to a PC for Wires-X node operation.

PC-Connected Radios: Some newer Fusion radios (e.g., FTM-300DR, FTM-400XDR) can function as a Wires-X node directly via USB, without the HRI-200.

Benefits of System Fusion & Wires-X

Seamless Analog/Digital: AMS provides easy transition, ideal for mixed environments.

Crystal Clear Digital Audio: C4FM offers excellent voice clarity, especially in noisy conditions.

Global Reach with Wires-X: Connect to hams worldwide through various rooms and nodes.

Data Capabilities: Transmit text messages, images (Picture Transmit), and GPS data.

Active Community: Large and growing user base, especially in North America.

Emergency Communications: Robust digital voice and data can be vital in emergencies.

Getting Started with System Fusion & Wires-X

Obtain a Yaesu System Fusion Radio: Choose a handheld, mobile, or base station that suits your needs.

Program Your Radio:

- Enter your callsign and other personal settings.
- Program local System Fusion repeaters.
- Learn how to switch between Analog FM and C4FM modes (or use AMS).

For Wires-X:

- **Option A (Node):** Get an HRI-200 or use a compatible PC-connected radio. Install Wires-X software on your PC.
- **Option B (Hotspot):** Configure a multi-mode hotspot (e.g., Pi-Star) for C4FM and Wires-X.

Explore Rooms: Once connected, browse and join various Wires-X rooms!

Advanced Features & Tips

Digital Group ID (DG-ID): Similar to CTCSS/DCS, allows for private digital groups within a frequency.

Portable Digital Node (PDN): Using certain radios (e.g., FT3DR, FT5DR) to create a temporary Wires-X node with just the radio and a Wi-Fi connection.

Picture Transmit: Send and receive still images directly between Fusion radios.

Firmware Updates: Regularly update your radio and repeater firmware for new features and bug fixes.

Wires-X Website: Check the official Wires-X website for room lists and node information.