



MICROCHIP

Announces Broad Expansion of Embedded Wireless Portfolio

Embedded WIRELESS

Bluetooth®

WiFi CERTIFIED

WiFi CERTIFIED

802.15.4

ZigBee®
Control your world

MiWi™

Bluetooth®

MICROCHIP RN42

MICROCHIP MRF24WG0MA

MICROCHIP MRF24XA

MICROCHIP RN77



Announcing on April 22...

Next-Generation MRF24WG0MA/MB Wi-Fi® Modules

- IEEE 802.11b/g agency-certified modules
- Feature-Rich TCP/IP stack and services

PIC32 Bluetooth® Audio Development Kit

- Platform demonstrates feature-rich yet low-cost digital-audio solution
- Supports Bluetooth Audio and Remote-Control profiles, and SBC, AAC and MP3 Audio CODECs

Next-Generation MRF24XA 2.4 GHz Transceiver

- Supporting both IEEE 802.15.4 and proprietary modes
- Low power consumption and 1.5V-3.3V operating voltage

RN XV Wi-Fi and Bluetooth Socket Modules

- XBee® footprint compatible
- Complete stack-on-board wireless solutions
- Simple ASCII command interface



Microchip Embedded Wireless:

www.microchip.com/wireless



www.microchip.com/wifi



www.microchip.com/zigbee



www.microchip.com/miwi



www.microchip.com/bluetooth



www.microchip.com/keeloq



Wireless “Connectivity of Things”



Home Health and Medical



Smart Power/Energy



Industrial Control and Monitoring



Home Control and Monitoring

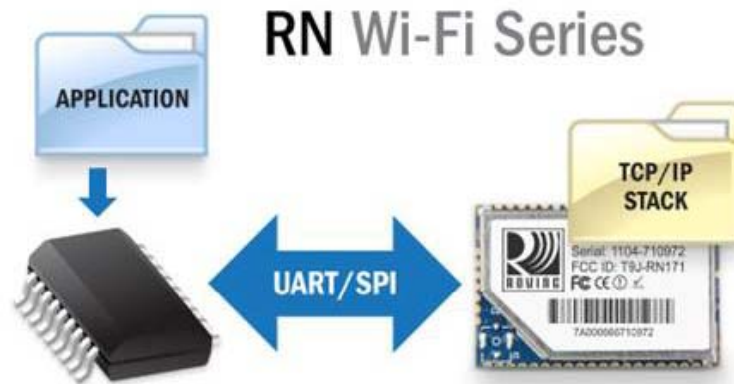
- Intermittently send small amounts of data
- Connect, transfer data, and get off
- Communicate with other things or users



Supporting the Internet of Things
With Embedded Wi-Fi®

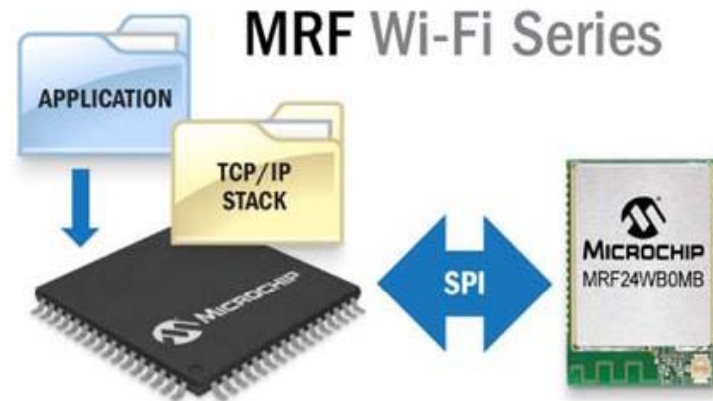


Wi-Fi® Product Portfolio



TCP/IP Stack on Module

- Simple ASCII interface, quick time to market
- Works with any MCU vendor (4, 8, 16 & 32 bit)
- Supports ALL PIC MCU families



TCP/IP Stack in PIC® MCU

- Elegant solution for combined Ethernet and Wi-Fi® architectures
- Feature-rich TCP/IP stack for additional services
- New IEEE 802.11b/g module is footprint compatible, easy upgrade for existing MRF Wi-Fi modules

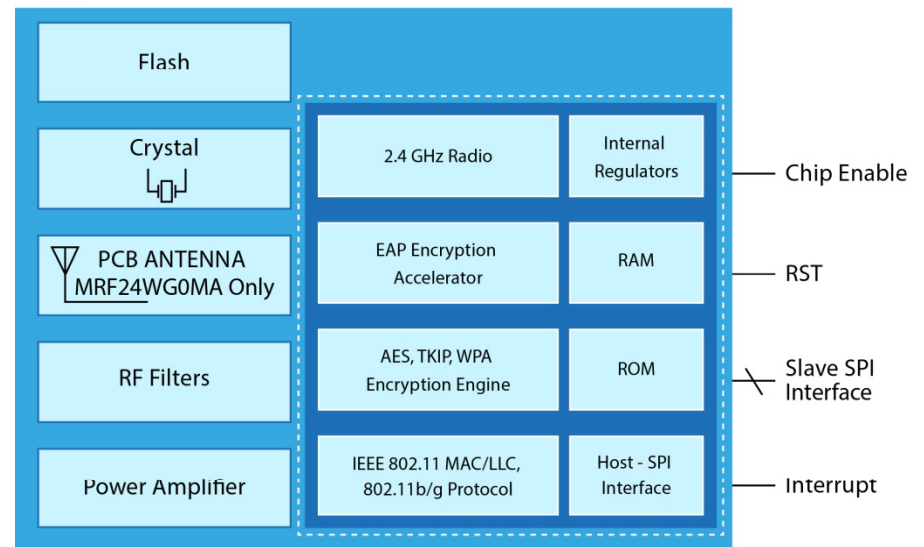


New MRF Wi-Fi® Modules

MRF24WG0MA/MB Modules

- **IEEE 802.11b/g Radio**
 - All b/g Data Rates, up to 54 Mbps
 - Sensitivity: -91 dBm
 - Output Power: Programmable (0-18 dBm)
- **MA: PCB Antenna; MB: External Antenna**
- **Security**
 - WEP64/128, WPA1/2, WPA-EAP
- **Networking**
 - Infrastructure, SoftAP, Ad-hoc, Wi-Fi® Direct
- **Interfaces**
 - SPI Slave: 5 Mbps Throughput over UDP
- **Services via PIC® MCU-Based Stack**
 - WPS, DNS, DHCP, FTP, SMTP (email), HTTP, Full Web Server, ZeroConf, SSL, others
- **Low-Power Modes**
 - Hibernate: 100 μ A
 - PS Poll 4 mA
 - Max RX: 156 mA
 - Max TX: 150-240 mA

MICROCHIP MRF24WG0MA/MB Wi-Fi® Modules





Development Tools

Software

- Feature-Rich TCP/IP Stack Provided in Source Code
- Stacks and Services
 - SoftAP Support
 - EZConfig
 - Bonjour, ZeroConf



Hardware

- **Wi-Fi® G Demo Board**
 - Part # DV102412, \$50.00
- **MRF24WG0MA PICtail™/PICtail Plus Daughter Board**
 - Part # AC164149, \$35.00
 - Compatible with Explorer 16 Development Board, PICDEM.net™ 2 Development Board, and PIC32 Starter Kit with I/O Expansion Board



All Available Now



High-Performance Platform for Quality
Digital-Audio Processing



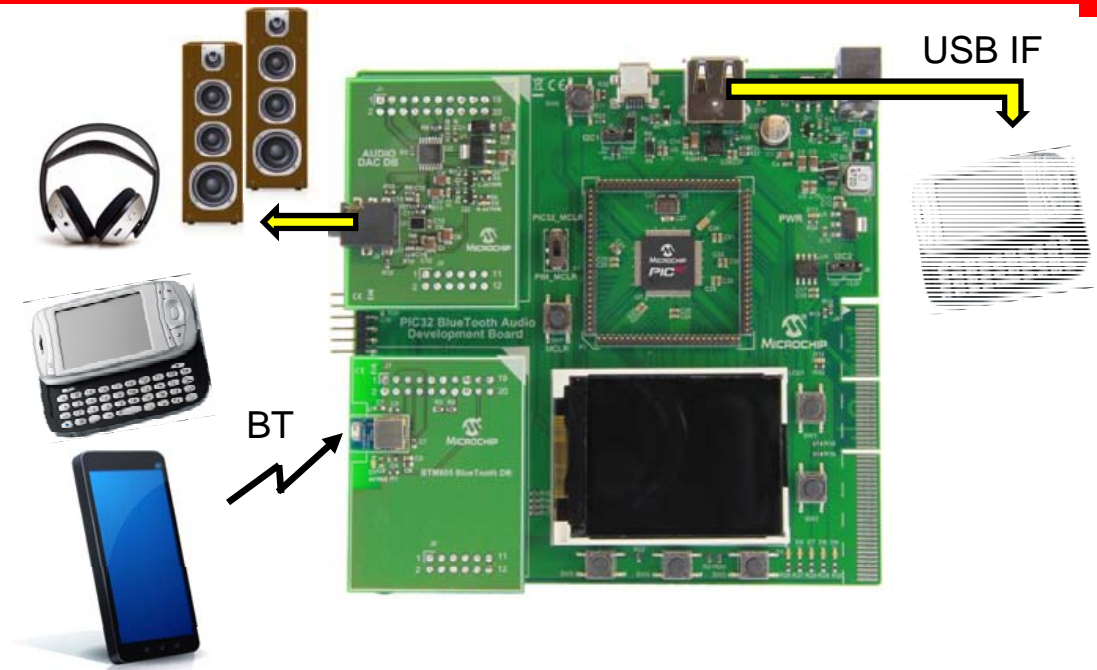
PIC32 Bluetooth[®] Audio Development Kit (DV320032)

Board Features

- Low-Cost Implementation
- PIC32MX 32-bit MCU
- 80 MHz, 256 KB Flash/ 64 KB RAM
- BT HCI Daughter Board
- 24-bit 192 kHz DAC DB
- USB Memory Stick Playback
- 2 inch Color LCD Display
- Headphone / Line-Out
- Audio Control Functions
- Wired Docking Capability

Availability

- Early Adopters – Now
- Production – Summer '13



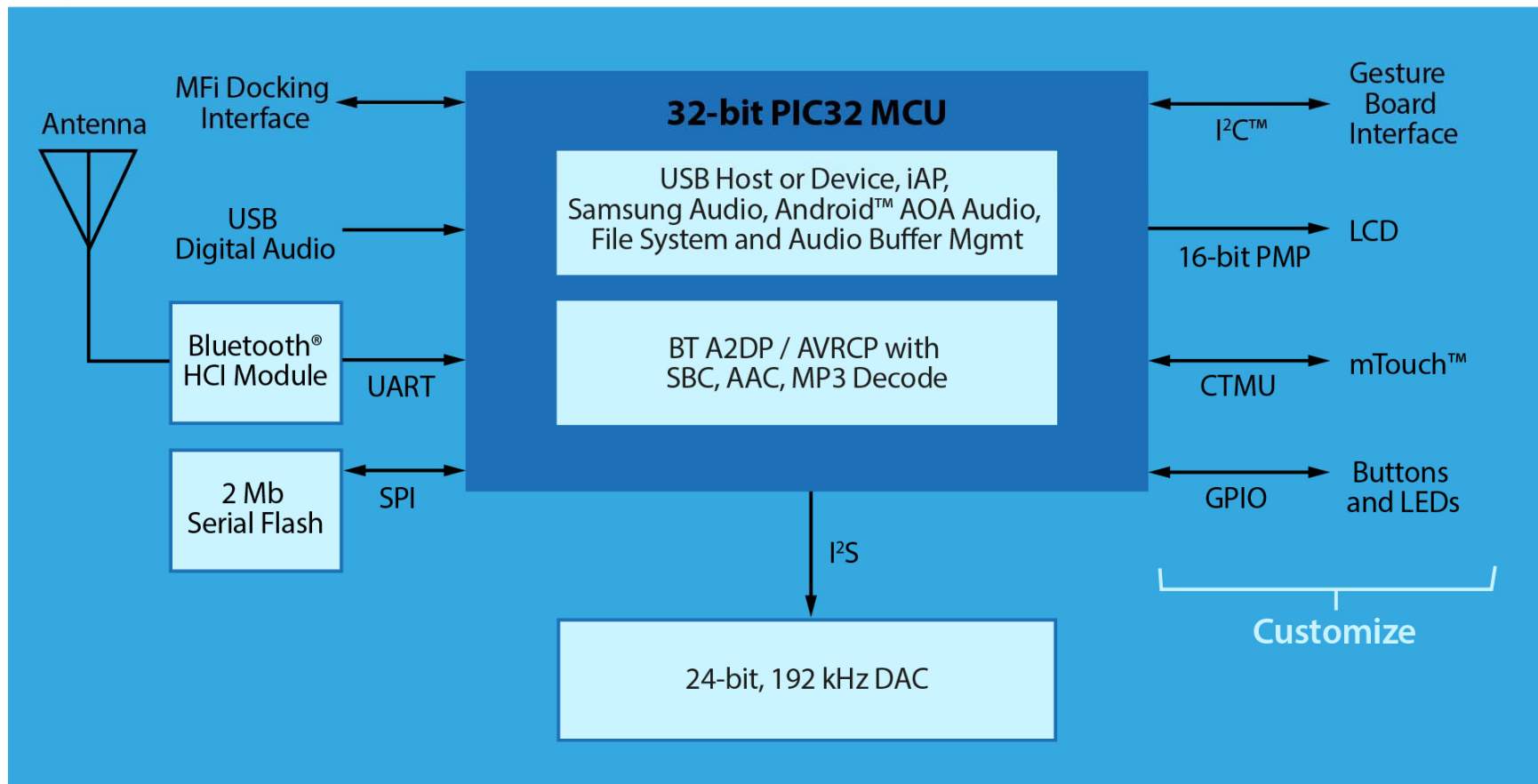
Available Software

- Apple[®] Made for iPod[®] Ready
 - iPhone[®] 5, Legacy iPhone
- Samsung Audio
- Android[™] AOA Audio
- Bluetooth Audio with SBC & AAC Decode
- MP3 Decode with FAT file system



System Example

MICROCHIP PIC32 Bluetooth® Digital Audio System





Next-Generation 2.4 GHz Transceiver:
IEEE 802.15.4 and Proprietary Modes



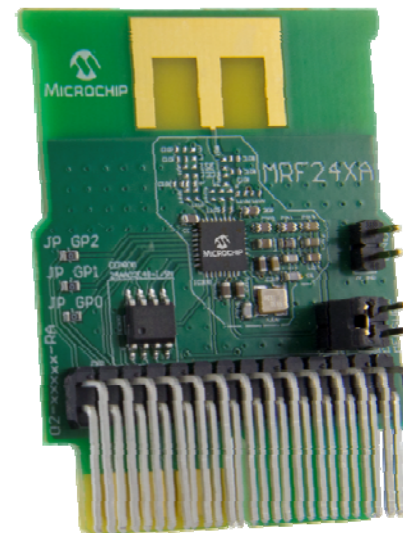
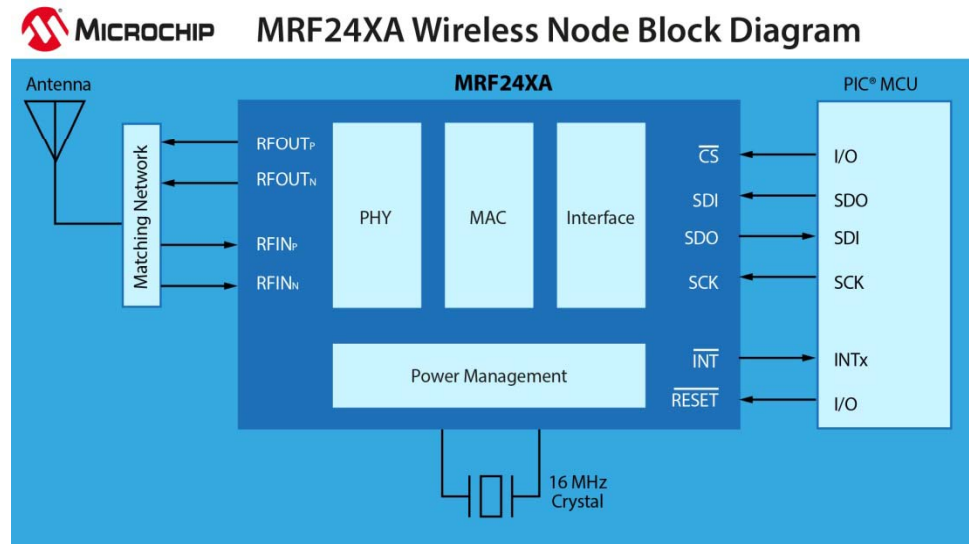
Next-Generation IEEE 802.15.4 & Proprietary Mode Transceiver

MRF24XA Features

- IEEE 802.15.4 Standard Mode (256 kbps)
- Proprietary Mode (125 kbps to 2 Mbps)
- 40 nA Deep Sleep
- 25 mA TX current (typical at 0 dBm)
- 13 mA RX current in RX Power-Save Listen
- 15 mA RX current in RX Packet
- SPI Interface to MCU
- Supply Range: 1.5-3.6V

Development Support

- MRF24XA PICtail™/ PICtail Plus Daughter Board
- Part # AC164152-1, \$24.95
- Available in May

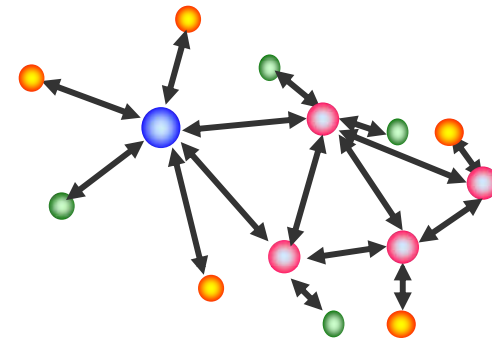




Microchip's IEEE 802.15.4 Protocol Stacks

Microchip Proprietary

- **MiWi™ Wireless Mesh Protocol**
 - MiWi P2P – Point-to-Point
 - MiWi Mesh – 8-hop mesh network
 - MiWi PRO – 64-hop mesh network
- **Size Range from 8 KB to 25 KB**



ZigBee® Alliance

- **PRO Protocol Stack**
 - Smart Energy Profile 1.1
 - Home Automation Profile
 - Light Link and Green Power
- **RF4CE Protocol Stack**
 - Controller and Target
 - 14-16 KB stack size
 - 8, 16, & 32-bit MCU support





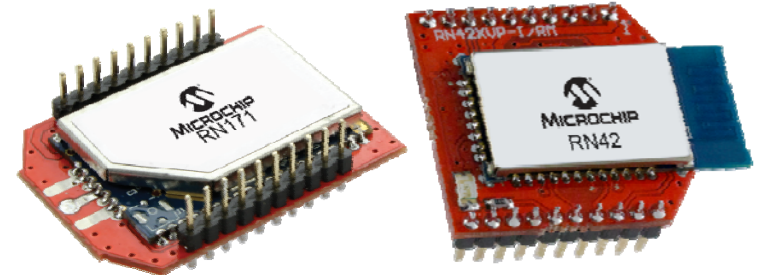
XBee[®] Footprint Compatible
Wi-Fi[®] and Bluetooth[®] Socket Modules



XBee[®] Footprint Compatible Wi-Fi[®] & Bluetooth[®] Migration

- **Wi-Fi[®] and Bluetooth[®] Through-hole, Plug-in Socket Modules**

- RN171XV (Wi-Fi) and RN41/42XV (Bluetooth)
- Prototyping
- Hobbyists



- **Fits Industry-Established Footprint**

- Easiest Way to Migrate from IEEE 802.15.4
- Enables Smart Phone/Tablet & Internet Connectivity

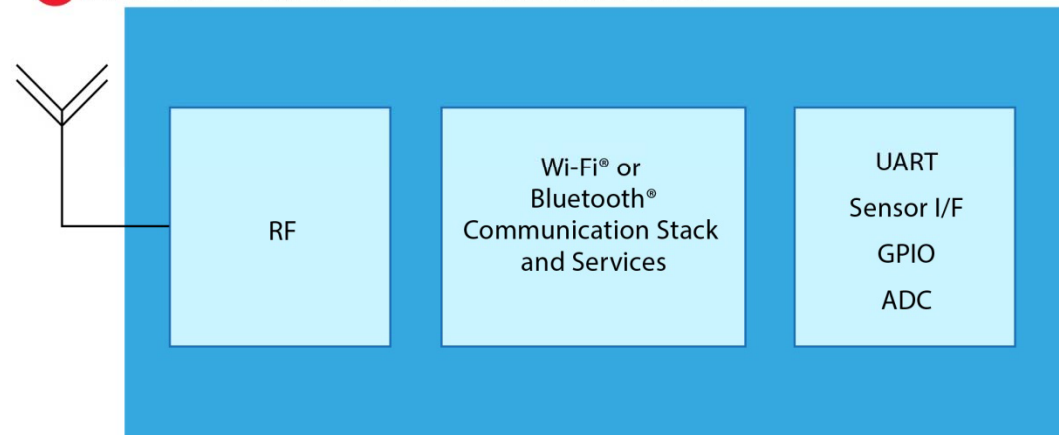
- **Certified Antenna Options**

- PCB Trace
- SMA / RP-SMA
- Chip
- UFL
- Wire

- **Development Tool**

- Evaluation Kit for RN XV Series
- Part # RN-XV-EK1, \$24.95
- Available Now

 MICROCHIP RN XV Series Socket Modules





Availability

Next-Generation MRF24WG0MA/MB Wi-Fi® Modules

- Now, in 36-pin modules
- Starting at \$18.75 each in 1,000-unit quantities

PIC32 Bluetooth® Audio Development Kit

- Now, via Microchip's early-adopter program
- Wide availability expected in the summer
- Contact Microchip sales representative to join early-adopter program

Next-Generation MRF24XA 2.4 GHz Transceiver

- Sampling Now, in a 32-pin QFN package
- Starting at \$1.89 each in 1,000-unit quantities

RN XV Wi-Fi and Bluetooth Socket Modules

- Now, in 20-lead socket modules with various antenna options
- Starting at \$14.56 each in 1,000-unit quantities



MICROCHIP

Back-Up Slides

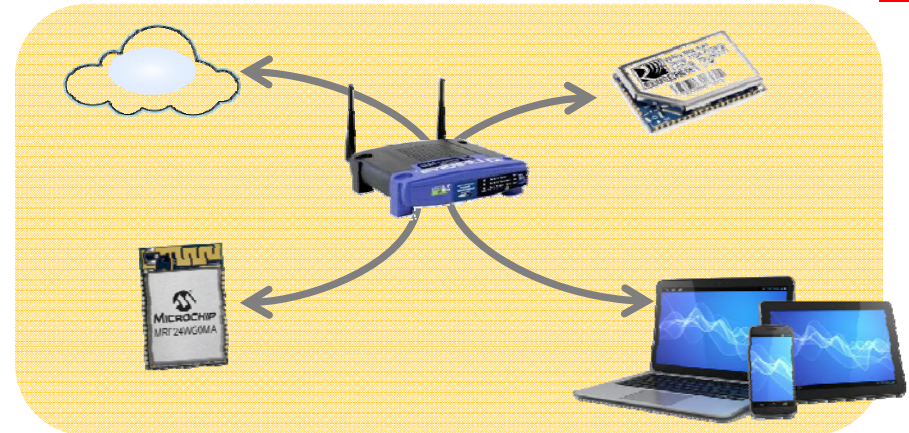
*Note: The Microchip name and logo, and PIC are registered trademarks of Microchip Technology Inc. in the U.S.A. and other countries.
MiWi, PICtail, and PICDEM.net are trademarks of Microchip Technology Inc. in the U.S.A. and other countries.
All other trademarks mentioned herein are property of their respective companies.*



Network Types

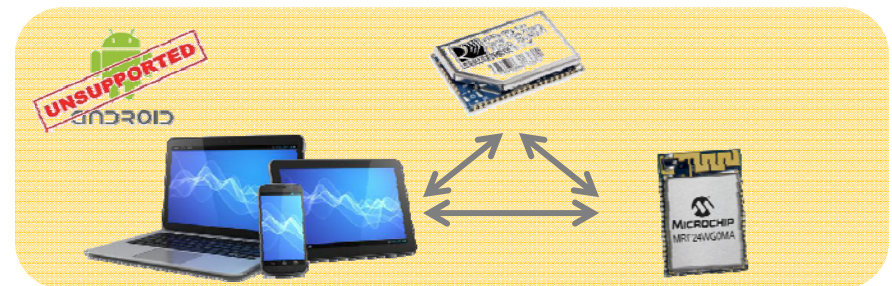
Infrastructure

- Client nodes communicate via an access point
- Most common, like connecting your PC to a home network



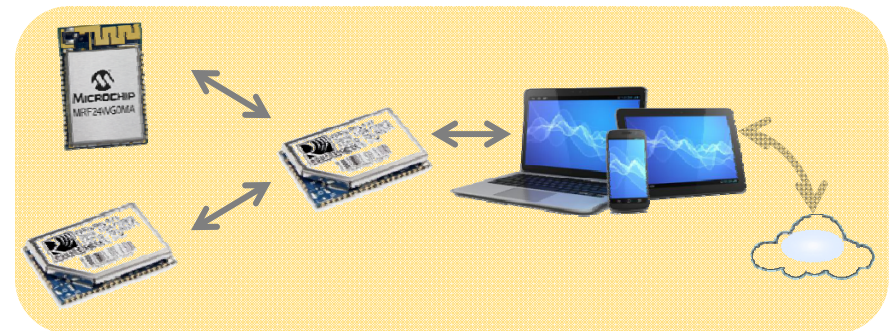
Ad-hoc

- Point-to-Point connections
- Every node connected to every other node
- Android™ unsupported



NEW Soft AP

- Module looks like an Access Point
- AP module is central coordinator
- Basic network management
 - DHCP, routing, gateway redirection



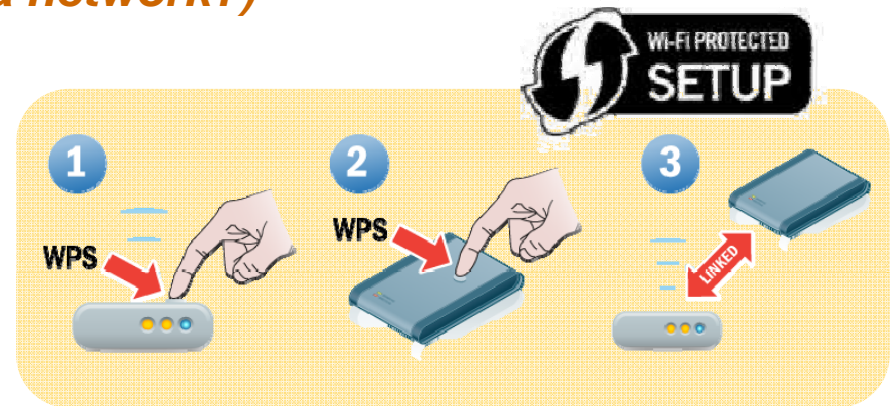


Provisioning Device Clients

- Provisioning (*How to connect to a network?*)

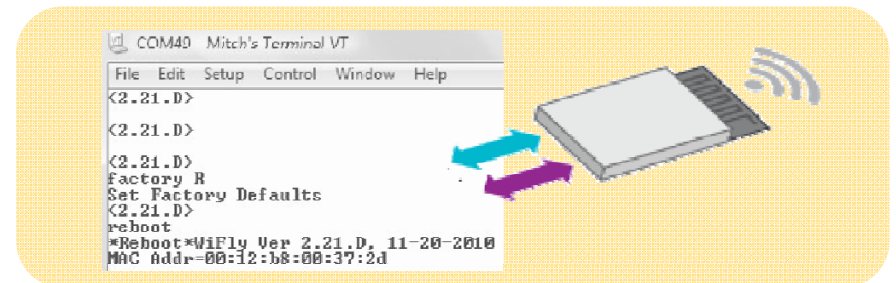
- **Wi-Fi® Protected Setup (WPS)**

- No user GUI required
- No host microcontroller oversight
- Simple push-button user interface



- **Command Line Interface (CLI)**

- UART / SPI – Simple ASCII interface
- Host microcontroller control



- **Webserver (http:// port 80)**

- Browser Interface





Microchip's Bluetooth® Audio Solutions

Now

• RN52 Fully Integrated Bluetooth® Module

- Complete Bluetooth + Audio + audio decoders
- I²S & analog audio outputs
- Simultaneous audio & data (for Apps)

Q2'13

• Microchip Bluetooth Audio Stack for PIC32

- Includes SBC and AAC audio decoders
- Fully Bluetooth SIG certified with QDID
- Interfaces to standard HCI Bluetooth modules

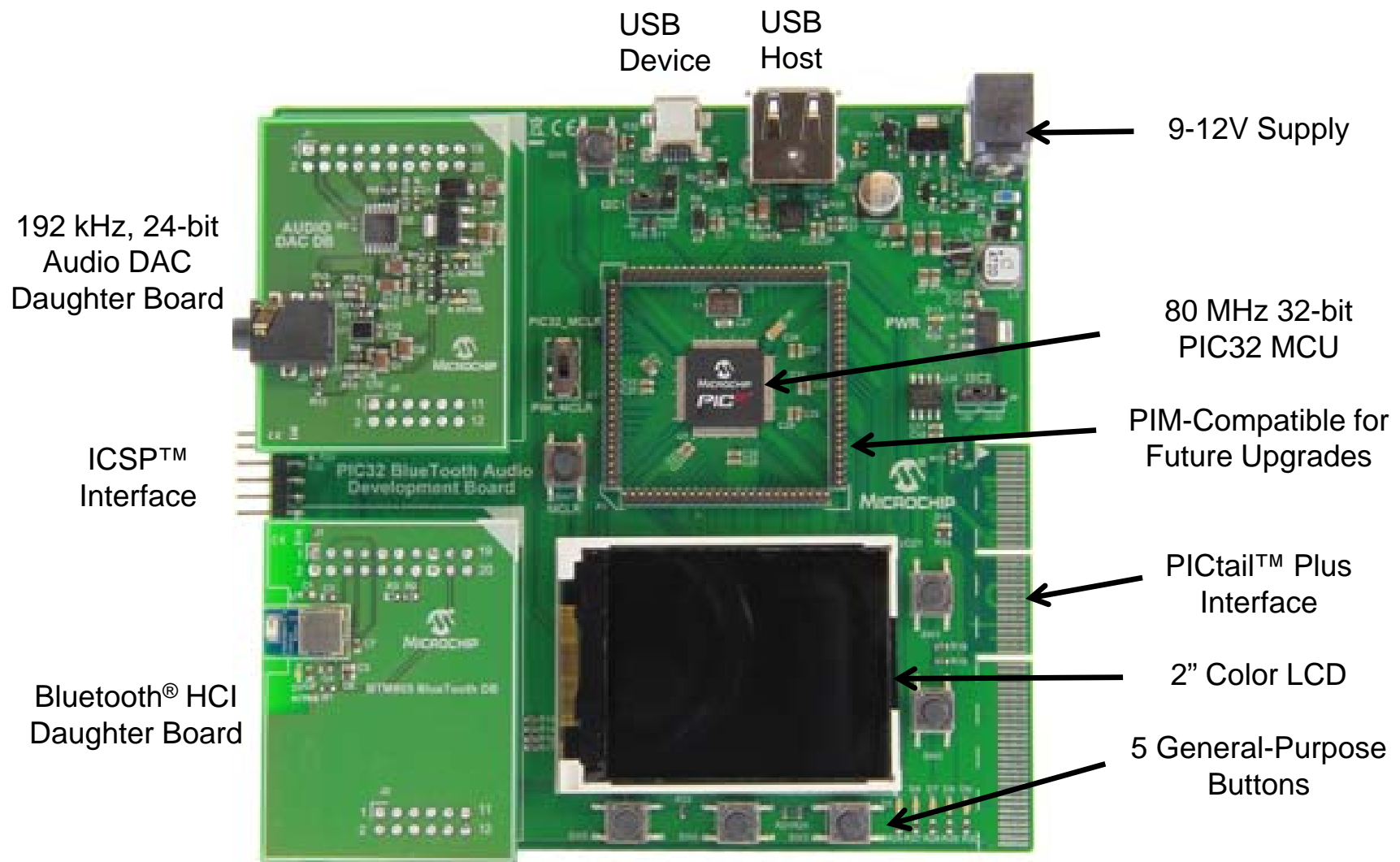
Q3'13

• Microchip Bluetooth HCI Module

- Low-Cost BT v3.0 host controller radio module
- BT SIG and Regulatory Agency Certified (with QDID)
- Interfaces to PIC32 via HCI over UART
- Interfaces to MCHP BT stack for SBC and AAC audio decode



PIC32 Bluetooth[®] Audio Development Kit (DV320032)





Microchip's IEEE 802.15.4 Product Portfolio

802.15.4 Transceivers

MRF24J40

MRF24XA
Low power

802.15.4 Modules

MRF24J40MA
+0 dBm

MRF24J40MB
+20 dBm, PCB Ant

MRF24J40MC
+20 dBm, Ext Ant

