

The Whirlpool Smart Device Network (WSDN) consists of a Home Area Network (HAN), Smart Meter Domain, and an Internet Domain. The ECM is part of the HAN whose main function is to provide connectivity for the Smart Appliances to an external network through the Intelligent Network Controller (INC) or a commercial Wi-Fi Access Point. The ECM is a module that is factory (and permanently) integrated into the appliance through keyed specialty connectors and permanent attachment method.

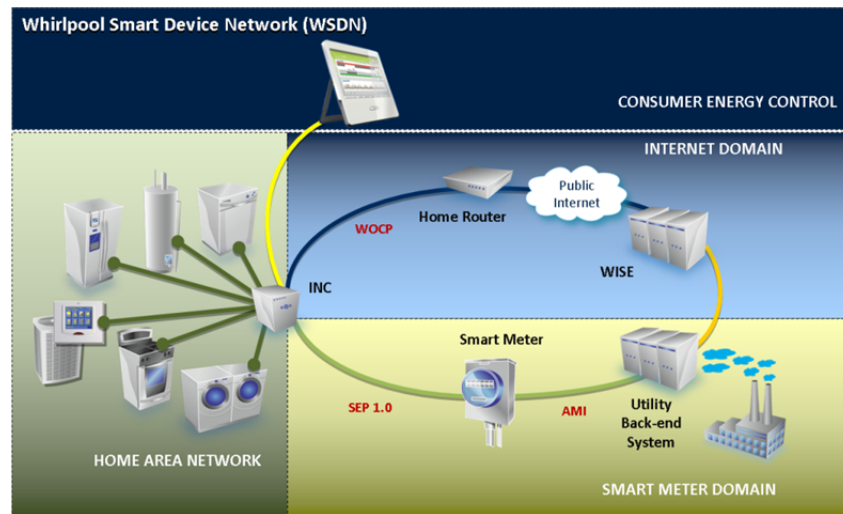
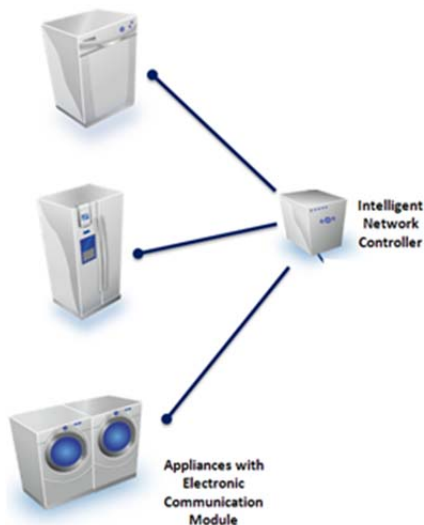


Figure 1 - Whirlpool Smart Device Network (WSDN)



**An ECM is installed during manufacture within each Smart Appliance that enables it to connect to an Access Point via Wi-Fi.**

Figure 2 – HAN System

The ECM module can report appliance power consumption data via 802.11 Wi-Fi to the WISE server through a Wi-Fi Access Point and the Internet. The data can be used to coordinate smart energy modes within the appliance to lower energy consumption during times of peak demand and consumer billing costs.

The ECM Wi-Fi radio operates only on Channels 1 (2412MHz), through 11 (2462MHz) within the 802.11b,g,n standards. The maximum conducted output power from the ECM module is +22dBm. The maximum power is set within the firmware of the module and cannot be changed or manipulated by any external means or control.

The output power is reduced to cases to both maintain the required linearity for the modulation scheme and to meet FCC band-edge requirements. Refer to Figure 3.

802.11 Protocol	Data Rate	Channel											Modulation
		1	2	3	4	5	6	7	8	9	10	11	
802.11b	1M_DSSS_22dBm	22	22	22	22	22	22	22	22	22	22	22	BPSK
	2M_DSSS_22dBm	22	22	22	22	22	22	22	22	22	22	22	BPSK
	5.5M_CCK_22dBm	22	22	22	22	22	22	22	22	22	22	22	QPSK
	11M_CCK_22dBm	22	22	22	22	22	22	22	22	22	22	22	QPSK
802.11g	6M_OFDM_21dBm	20	20	21	21	21	21	21	21	21	20	19	BPSK
	9M_OFDM_21dBm	20	20	21	21	21	21	21	21	21	20	19	BPSK
	12M_OFDM_21dBm	19	20	21	21	21	21	21	21	21	20	19	QPSK
	18M_OFDM_21dBm	19	20	21	21	21	21	21	21	21	20	19	QPSK
	24_OFDM_21dBm	19	20	21	21	21	21	21	21	21	20	19	16-QAM
	36_OFDM_21dBm	19	20	21	21	21	21	21	21	21	20	19	16-QAM
	48M_OFDM_19dBm	19	19	19	19	19	19	19	19	19	19	18	64-QAM
	54M_OFDM_19dBm	19	19	19	19	19	19	19	19	19	19	18	64-QAM
802.11n	MCS0_HT20_19dBm	18	19	19	19	19	19	19	19	19	19	18	BPSK
	MCS1,2_HT20_19dBm	18	19	19	19	19	19	19	19	19	19	18	QPSK
	MC3,4_HT20_19dBm	18	19	19	19	19	19	19	19	19	19	18	16-QAM
	MCS5,6,7_HT20_19dBm	18	19	19	19	19	19	19	19	19	19	18	64-QAM

 Power Shaping

Figure 3: ECM Utilized Channels (US) and RF Output Power

The antennas are remote to the ECM module and connected through coax to a keyed FAKRA type connector. Both the ECM module and the two antennas are professionally and permanently installed by the manufacturer within an appliance during factory manufacture. The keyed connector interface is non-standard relative to “off-the shelf” antennas and is not within user or consumer access without disassembling the appliance. The applicable antenna(s) are included in the filing. No other antennas, external or not included within the approved filing, are utilized.