The Edge Router includes an ARM9 processor as the main processing entity that controls most of the system features (some features are integrated internally into chip). Subsystems controlled by the ARM processor are:

- Two directly connected serial channels. First channel is used for serial console port used for factory programming and as debug console and is available on the as RS232 connection. Second channel is used for intercommunication (watchdog, commands, control and BSL mode) with the MSP430 microcontroller that ensure system level watchdog and low power modes of operation. Also the second channel is used for remote firmware upgrade of MSP430 code by using the BSL mode programming mode.
- Two directly connected USB host channels. First channel is used for uplink USB to a 4 port USB hub situated on the communication board in order to extend the number of channels to necessary slot ports. Second channel is used for providing the front panel USB user channel for administration via serial interface and configuration purposes or as general USB host port for further applications.
- One Ethernet port (twisted pair port - 10/100Base-T). ARM processor implements the Ethernet MAC internally and connects via the external PHY IC to RJ45 available connector on the main board.
- One 16-bit Data Address and Control bus for easy interfacing the memory subsystem. Multiple chip select signals allow simple interface and multiple methods for booting the system.
- Hardware SPI bus multiplexed for use with 2K Boot EEPROM option, micro-SD card slot on main board for boot or storage or optional installed LCD panel.
- A large number of I/O grouped for internal control of board subsystems, for control of power signals latch, for control of BSL programming mode of MSP430, for implementing the I2C buses on the board. Two signals drive the Red and Green on board LED's.

The ARM memory subsystem is situated on the main board and includes the FLASH memory (implemented 16Kbyte) and the two RAM memory chips (implement 2 x 32Kbyte). No buffering is included between memory and ARM processor. Boot of system is realized from FLASH image programmed at factory. Also FLASH accommodates the file system, application code and space for data storage. The RAM memory is used to run the live system after boot, as temporary storage file system and as memory allocated for system.
A set of 4 USB ports present on communication board are connected to USB-to-Serial converters (internally) and supplemental circuitry that allow creation of slots (communication slots) for the OEM installed communication modules. Slot powering is controlled internally via a latch. This ensure a lot of flexibility for available power on/off modes used in firmware.
The power supply subsystem include a 3.3V permanent power supply with low quiescent current for MSP430 low power modes, a set of two power supply for 3.3V and 1.8V for the ARM, a 5V power supply for the USB hub and serial to USB converters and level shifters of the communication board, one high current (up to 4A) switched power supply for powering the OEM radio modules installed. Some extra linear regulators are

present in order to efficiently provide the voltages for OEM modules and control the power. Power supply can be switched ON/OFF under ARM control (separate for each OEM module installed), the ARM power and USB hub power can be switched ON/OFF under MSP430 control in order to support fine power management and a large combination of modes of operation.
The main internal voltage is 12V and is provided by the AC-DC converter module installed together with the main and communication board into the internal metallic enclosure (for shielding purposes). Input voltage is AC trough installed power cord and screw connections of the AC-DC power module.
Some auxiliary subsystems are present for internal management and include:

- Temperature and humidity sensor for environment management and alarms if unit is exposed to values outside the specified range
- Precision hardware RTC used for applications that need precise time keeping, also this is the 32KHz reference for the ARM processor internal RTC. The RTC selected should allow drifts of no more than 3-4 seconds/month under normal conditions and better if calibration trimmed at factory.
- Analog measurements via ARM analog input pins for on board voltages in order to allow alarms when on board circuitry present anomaly in usage or onboard components are faulty affecting the correct range for voltages.

Whole boards are installed stacked into the inside metallic enclosure and include the power supply (in order to minimize the RF emissions). The external connections for antennas and Ethernet are routed outside the metallic enclosure to proper connectors on the IP-65 certified external plastic enclosure.

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