



We.R

Family and Home Management

System Description

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1 The System Concept & Overview

1.1 Overview

Advances in mobile, wireless and other technologies have empowered us with new capabilities wherever we go. New, affordable, easy-to-use and energy-efficient devices are launching us beyond the Smart Home promises of the past, into a larger world of comprehensive family and home management solutions that enable us to improve our lives, not just at home, but everywhere we live.

The We.R Family and Home Management Solution

Since 1994, over 10 million devices have been installed by the Essence Group worldwide. Based on proven technology the We.R Family and Home Management solution transforms mobile handsets and personal computers into powerful remote control devices that help to increase security and make life easier for families, friends and communities.

All products feature wireless connectivity, outstanding ease-of-use, and maximum flexibility to protect the home and accommodate a wide variety of household and user scenarios.

All We.R systems are based on advanced, fast, secure wireless technology, providing complete connectivity -- at home or on the go.

Expandability

We.R Family and Home Management solutions feature an expandable sensor array that provides the flexibility to create an ideal solution for every home. Users can add safety and security accessories, such as additional cameras, etc., for better protection and improved monitoring of the home.

In addition to residential security, the We.R Family and Home Management system is built as a modular system that can be expanded by adding additional future devices which will be available in the future (energy consumption, home automation, elderly and childcare and more).

1.2 System Goals

The We.R system is an independent platform that supplies unified and extendable services for home security safety & automation, family care and energy management.

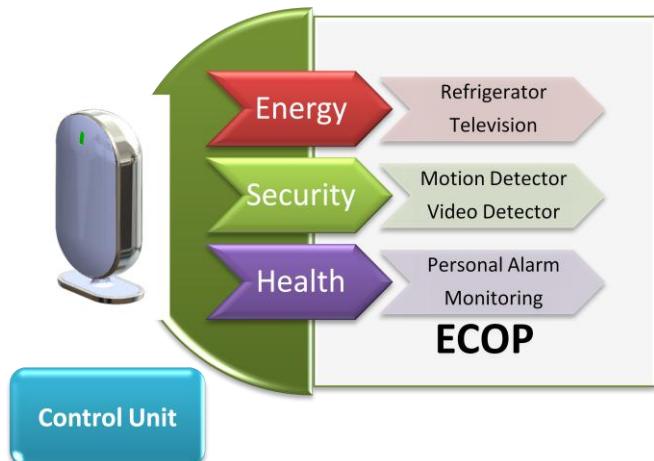
The system will support millions of homes and commercial users using web and mobile handset interfaces with feature-rich applications provided by the We.R system and 3rd party service providers.

The System provides a robust, scalable, recoverable, fully-proven infrastructure spread across several geographic sites supplying minimum latency and maximum reliability for our customers.

1.3 Home Area Network (HAN)

The We.R products communicate with the Control Node in the HAN (home area network) using ECOP. The We.R Control Unit serves as the gateway between the HAN and the GSM/GPRS network. We.R products include (some examples only):

- Motion Detector
- Video Detector
- Safety Detector
- EcoSmart RF relay & smart plug (future)
- And others

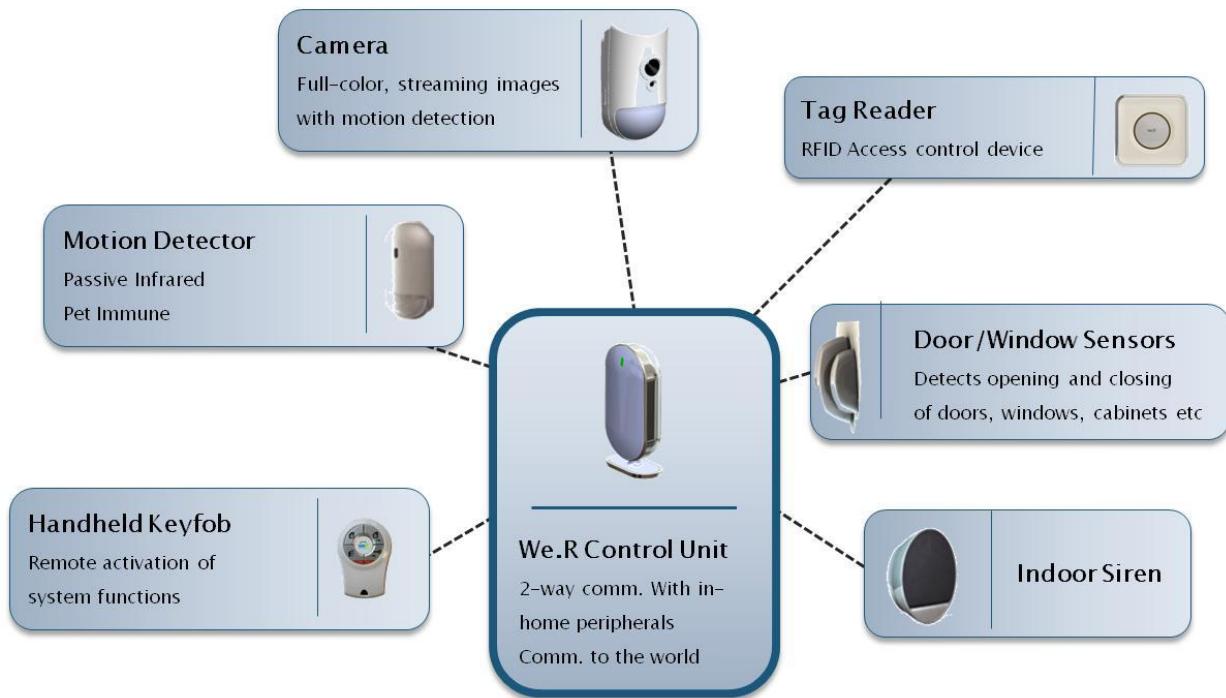


1.4 Use cases

Below are some of the most common use cases of the system:

- Get real time alert in case of unpermitted access to your home
- Protect your valuables & personal belongings, based on your unique living habits
- Monitor the cleaner, babysitter and other staff entrance and exit times
- Be informed when your kids are back from school or arrive from a date
- Keep your kids away from the medicine cabinet, basement and other zones
- Watch over your children when away from home
- Watch over your elderly parents in case they need you
- Look in and watch your pet left alone at home

1.5 We.R Equipment within the home



1.5.1 Control Panel

- The main unit within the home - the heart of the system, is responsible for RF communication together with the system sensors in addition to communicating with the outer world.
- Includes built-in rechargeable battery, EDGE/GPRS radio and Ethernet module for ADSL router connection (Ethernet option is model dependant).

1.5.2 Motion Photo Detector

- Provides on-demand or IR-triggered photo verification capability.
- Captures full-color JPEG photos (up to 5 frames/second)

1.5.3 Motion Detector (Passive Infrared)

- 4th Generation DragonflyEye™ Multi-Zone spherical lens with pet-immune capabilities

1.5.4 Door/Window Magnetic Sensor

- Bi-directional wireless sensor; easy to install and operate

1.5.5 Indoor Siren

- Battery-operated, wireless, powerful siren for alarm indication

1.5.6 Handheld Key Fob

- 5 keys, used to ARM/DISARM/PART ARM the We.R security systems in the home or office
- Visual indication of status of the system (did I arm the system?)
- Can also be used as a personal SOS alarm (panic button).
- Remote deactivation in case of loss/theft

1.5.7 Wireless Access Control Tag Reader (Optional accessory)

- An intuitive and user-friendly access control unit for We.R system
- Based on RFID technology (MiFare)
- Provides ARM/DISARM, Various doorbell functions
- Remote deactivation of tags in case of loss/theft (via mobile handset and/or Personal Computer)

1.6 ECOP – Enhanced Controlled Open Protocol

ECOP is a complete, end-to-end proprietary protocol used throughout the We.R system.

- Between home sensors and home control units (ECOP-R)
- For external networks (control unit to the world)
- ECOP-X - The XML representation of the ECOP protocol.
- Several types of clients (Symbian, Web Server, iPhone, Java, Windows Mobile, etc.) parse the ECOP protocol.
- The ECOP-N protocol is serialized to a standard XML and is transferred to any kind of client. (A distinct ECOP-N protocol parser is not needed for each kind of client.)

For details regarding the RF implementation of ECOP, please refer to chapter 5 in this document.

1.7 Supported Devices

The We.R system can support the following number of devices & users, all connected to one control panel

Peripheral	Number of devices
Key Fob	Up to 8
Magnetic Switch	Up to 32
Passive Infrared Detector	Up to 32
Indoor Photo Detector	Up to 32
Indoor Siren	Up to 4
Users	Up to 31 (2 as master users)

2 We.R RF Technology

2.1 Radio Interface Information

Our system works in a star topology where the Control Panel (gateway) acts as the coordinator, controlling all other sensors and peripherals.

License free band disturbance

The data is sent over the air via our proprietary RF protocol (ECOP) in 802.15.4 (standard compliant in accordance with EN 300 -440) and works at 2.4 GHz ISM band.

- Gateway (GW) uses a band pass filter for out-of-band noise suppression
- In-band noise is complaint with EN-300-440
- Inter-systems disturbance - each system uses a specific system identifier (32bits) and filters non-conforming packets
- In case of radio jamming, the GW alerts the server of the jamming.

Power and sensitivity

- Our systems transmit with the maximum allowed power according to standard EN 300 -440 (Europe), FCC CFR47 Part 15.

Depending on the device: power and sensitivity are divided in 2 main categories:

Rx Sensitivity	Tx Power
-103 dbm (sensors)	14 dbm
-103 dbm (control panel)	20 dbm

Channels, bandwidth and polling

- Using our ECOP protocol, we can utilize between 1 to 16 channels.
- The channel bandwidth is 5 MHz
- Our systems are using Beacon-enabled network intervals, about 100ms for quick response time.
- Modulation type: QPSK, 8 chips DSSS
- Baud rate: up to 250Kbps

Low energy consumption

- ECOP protocol is an externally low-power RF protocol based on 16 years of experience in battery-operated devices. For example, we use a mechanism that significantly reduces listening time (one of the major drains on battery life).

3 Security Aspects

- Security of communication between user and application server
 - Authentication:
 - Mobile authentication is performed by email, password and PIN code for application activation.
 - Password and PIN code are encrypted on the mobile with a SHA1 algorithm.
 - The encrypted value is calculated once and sent as identifying credentials over the air
 - The server generates the encrypted value locally based on stored user details and performs the authentication
- Security of communication between GW and application server
 - Data is authenticated using a proprietary protocol.
- Security of communication between GW and sensors
 - All communication between GW and the sensors are encrypted using an AES algorithm with varying keys.

4 FCC Radio frequency interference statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Essence Security is not responsible for any radio or communication interference caused by using other than specified or recommended cables and battery or by unauthorized changes or modifications to this equipment. Unauthorized changes or modification could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.