The EPR eDevice Standard ©
(A standard handled by OASIS BCM-EPR SC and EPR-forum)

Services in your Hand

Possibility to control the system over the Internet
Infrared device control
Light control
Motion detectors
Air conditioning control

Touch screen
Irrigation control

Legend
Sensors
Activation controls
Controls

Ventilation control
Smoke detectors
Switch control
Window opening & closing control
Gate & garage door control

Plug control
Window shading control

External light control
Alarm
Domestic heating centre control

Heating device control
Surveillance cameras

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The EPR eDevice “open” standard
XML based Functional modeling of electronic Network devices ( Nodes)
(Real time “mirroring” standard” )

This Real time **Web Services** based EPR eDevice standard do “mirror” the functionality to an abstraction level for SOA service based scenario scheduling of all electronic devices (nodes) enabled through all wanted “open” BUS-related network systems.

- eDevice UDDI ( device catalog)
- eDevice WSDL( device mirrored model)
- eDevice SOAP ( message protocol )

The **EPR eDevice Interoperability standard** is derived from the ANSI/CEA-721 developed over the last 25 year by companies, organizations and individual persons as:

- ABB
- Ademco
- AMP
- Caddx Controls
- Chamberlain Group
- Cutler-Hammer
- Diablo Research Corporation
- Domosys Corporation (Analog devices)
- Dr. Ken Wacks
- Full House Control
- Honeywell
- Hypertek
- IBM
- Intel
- InteliHome
- Intellon Corporation
- Interactive Media Systems
- ISO/IEC JTC1 SC25 WG1 Home Electronic System
- IT & Process / IT & Integration
- Leviton
- Lucent Technologies
- Microsoft
- Philips
- Siemens
- Smart Corporation ( Microsoft + GE )
- The Training Department
- Thomson Consumer Electronics
- XLSynergy
Access infrastructure

INTERNET / INTRANET

WEB Browsers: Thin Clients (OS independent GUI)

Web Access portal:
(Web services technology)
- UDDI (Device catalog / product overview)
- WSDL (Peer = mirrored XML device model/)
- SOAP (message protocol)

PROCESS NET

Bus controlled Electronic Devices:
- Ethernet
- Firewire
- USB
- Bluetooth
- CAN
- X10
- DALI
- KNX/EIB
- RFID
- Lon
- SCP/CEBus
- PowerBus
- MOD bus
- MDB
- etc

SOA Front Office
Portal + UDDI device catalog
(WSDL models of electronic network devices)
## Scenario variables for the eDevice Engine (Used in Template programming)

### Universal Variables = User SCENARIO Variables

<table>
<thead>
<tr>
<th>MEASUREMENTS: (Environment Inputs)</th>
<th>ACTUATORS: (Environment Outputs)</th>
<th>SYSTEM/GUI Values: (Internal SW values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature sensors (°C)</td>
<td>Voltage output (Volt)</td>
<td>Thermostat set point (°C)</td>
</tr>
<tr>
<td>Humidity sensors (%RH)</td>
<td>Level output (%)</td>
<td>Alarm limits</td>
</tr>
<tr>
<td>Blod Pressure sensors (Bar)</td>
<td>Dimmer output (%)</td>
<td>Clock</td>
</tr>
<tr>
<td>Dimmer sensor (%)</td>
<td>Relay output (On/Off)</td>
<td>Timer Event</td>
</tr>
<tr>
<td>Speed sensor (m/s)</td>
<td></td>
<td>Intervals</td>
</tr>
<tr>
<td>Voltage sensor (Volt)</td>
<td></td>
<td>Step value</td>
</tr>
<tr>
<td>Current sensor (Amp)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load sensor (kWh)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch sensor (On/Off)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulses (Counter)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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The eDevice Node Productmodel building elements

eDevice Interoperability layer: (Application modeling+CAL)

Appl. Groups: (CX)
0x General
1x Audio/Video
2x Lighting
3x Communication
4x HVAC
5x Utility
6x Security
7x Appliance
8x Convenience
9x Food/Meal
Ax Medical/Health

Appl. Functions: (OB)
01 Node Control
02 CX Control
03/04 Data Chan. Rx/Tx
05/06 Binary Output/Input
07/08 Analog Output/Input
09 MultiPosition Output
0A Multi-State Input
0B Matrix Output
0C Multiplane Output
0D Ganged Analog Ctrl
0F Meter
10 Display
11 Medium Transport
13 Dialer
14 Keypad
15 List Memory
16 Data Memory
17 Motor
19 Synthesizer-Tuner
1A Tone Generator
1C Counter/Timer
1D Clock

Appl. Variables: (IV)
b Boolean data (On/Off)
c Letters (ASCII text)
n Numbers (Integer)
d Binary data (Hex bytes)

SOAP (CAL methods):
SETOFF
SETON
GETVALUE
GETARRAY
SETVALUE
SETARRAY
ADD
INCREMENT
DECREMENT
COMPARE
COMPARE_I
COPYVALUE
SWAP
EXIT
ALIAS
INHERIT
DISINHERIT
IF
DO
WHILE
REPEAT
BUILD
Basic object icon format

Network Input

message

Object Class icon

XX Object name

Object Network category

Network Output

message
Object Symbols

01 Node Control

02 Context Control

03 Data Ch.Rx

04 Data Ch.Tx

05 BinaryControl

06 BinarySensor

07 AnalogControl

08 AnalogSensor
Object Symbols

09 MultiPosSwitch

oA MultiPosSensor

0B MatrixSwitch

oF Meter

10 Display

11 MediumTrans

13 Dialer

14 KeyPad

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Object Symbols

15 ListMemory
16 DataMemory
17 Motor
18 Synth/Tuner
19 ToneGen.
1C Counter/Timer
1D Clock
EPR eDevice ( WSDL Peer- Node )
mirrored Web Services as a XML COMPONENT

EPR eDevice UDDI Node catalog:

Elements of Component MODEL:
- Events
- Simple Properties
- Bound Properties
- Constrained Properties
- Customization
- MetaData
- Packaging
- Composition and Containment
- Component Lifecycle

Node COMPONENT MODEL: (WSDL)
A “mirrored” node’s functionality and configuration.
ESS Process Server: (Peer = mirrored device/node)

ESS Process Server expose Web Services (XML) to an eDevice UDDI

Thin Server:

Web Service WSDL interface to Peers and Scenarios (TCP/IP Router)

Device Browser’s Artificial WSDL Peer

WSDL Peer 1   WSDL Peer 2   WSDL Peer n

CAL Packet Interpreter (CAL Parser)

SCENARIO Scheduler

Daemon’s Engine (CAL Router)

Virtual Device Driver

Driver TCP/IP

Driver CAN

Driver X-10

(Driver KNX)

Driver LonWorks

Process Driver Router

TCP/IP

CAN

X-10

KNX

Lon

Process Networks of different devices (Nodes)

Device Browser

Artificial WSDL Peer

Virtual Device Driver

TCP/IP

WSDL Peer 1

WSDL Peer 2

WSDL Peer n

CAL Packet Interpreter

CAL Packet Builder

Web Service WSDL interface to Peers and Scenarios

Scenario no 1

Scenario no n

Daemon (Mirroring Process)

Hardware BUS-interfacing:

TCP/IP

CAN

X-10

KNX

Lon

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