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ETSI Standard

Environmental Engineering (EE);
Monitoring and Control Interface for Infrastructure Equipment
(Power, Cooling and Building Environment Systems used in
Telecommunication Networks);
Part 7: Other utilities system
control and monitoring information model

Reference

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Environmental Engineering (EE), and is now submitted for the ETSI standards Membership Approval Procedure.

The present document is part 7 of a multi-part deliverable covering Monitoring and control interface for infrastructure equipment (Power, Cooling and environment systems used in telecommunication networks), as identified below:

    Part 1:   "Generic Interface";

    Part 2:   "DC power system control and monitoring information model";

    Part 3:   "AC UPS power system control and monitoring information model";

    Part 4:   "AC distribution power system control and monitoring information model";

    Part 5:   "AC diesel back-up generator system control and monitoring information model";

    Part 6:   "Air conditioning system control and monitoring information model";

    Part 7:   "Other utilities system control and monitoring information model";

    Part 8:   "Remote Power Feeding System control and monitoring information model".

1   Scope

The present document applies to monitoring and control of other utilities for telecommunication equipment.

The present document defines:

- The monitored and controlled other utilities system architectures.

- The minimum set of exchanged information required at the interface, described in "natural language" in text tables.

- The XML files with tags and variables corresponding to the data in the tables.

2   References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:

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    - for informative references.

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NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1   Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1]   ETSI ES 202 336-1: "Environmental Engineering (EE); Monitoring and Control Interface for Infrastructure Equipment (Power, Cooling and Building Environment Systems used in Telecommunication Networks); Part 1: Generic Interface".

[2]   IETF RFC 4566: "Session Description Protocol".

2.2   Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1]   IEEE 802 (part 1 to part 11): "IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture".

[i.2]   ISO/IEC 8879:1986: "Information processing -- Text and office systems -- Standard Generalized Markup Language (SGML)".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the following terms and definitions apply:

alarm: any information signalling abnormal state, i.e. different to specified normal state of hardware, software, environment condition (temperature, humidity, etc.)

> NOTE: The alarm signal shall be understood by itself by an operator and shall always have at least one severity qualification or codification (colour, level, etc.).

> EXAMPLE: Rectifier failure, battery low volage, etc.

alarm loop: electrical loop which open or closed state correspond to alarm start (set) or end (clear) state

alarm message: text parts of the alarm structure

alarm structure: organized set of information fields in an alarm data frame (time stamp, set/clear, text, etc.)

Control Unit (CU): integrated unit in an equipment to monitor and control this equipment through sensors and actuators

Data Gathering Unit (DGU): functional unit used for several functions:

- collect serial, digital, and analog data from several equipment;

- option to send (output) serial or digital commands;

- forward/receive information to/from the Local/Remote Management Application via agreed protocols;

- mediation between interfaces and protocols.

> NOTE: This function may be integrated as part of specific equipment.

ethernet: LAN protocol

> NOTE: Equivalent to IEEE 802.1 to 11 [i.1].

event: any information signalling a change of state which is not an alarm: e.g. battery test, change of state of battery charge

> NOTE: The event signal is be understood by itself by an operator and is always have at least one severity qualification or codification (color, level, etc.). It is be transmitted in a formatted structure with text message and other fields like for alarm, e.g. an event can be coded as an alarm with severity "0".

eXtensible Mark-up Language (XML): application profile or restricted form of SGML

> NOTE: By construction, XML documents are conforming SGML the Standard Generalized Markup Language (ISO/IEC 8879 [i.2]). documents. XML is designed to describe data and focus on what data is. XML is discerned from the well known Hypertext Transfer Mark-up Language (HTML) which was designed to display data and to focus on how data looks.

Extensible Style sheet Language (XSL): language for expressing style sheets

> NOTE: It consists of two parts, a language for transforming XML documents, and an XML vocabulary for specifying formatting semantics. An XSL style sheet specifies the presentation of a class of XML documents by describing how an instance of the class is transformed into an XML document that uses the formatting vocabulary.

infrastructure equipment: power, cooling and building environment systems used in telecommunications centres and access networks locations

> EXAMPLE: Cabinets, shelters, underground locations, etc.

object: class description of items that accept a set of properties or functions

NOTE: Generic objects can include more specific items and inherit from their properties. If correctly structured, object programming can allow the system to evolve, i.e. be more future-proof. The code should intrinsically be open and structured.

warning: low severity alarm

World Wide Web Consortium (W3C): consortium founded in October 1994 to develop common interoperable protocols and promote World Wide Web

NOTE: See http://www.w3c.org.

XCU: CU enabled to communicate using XML interface as defined in the present document

XML Schema Definition (XSD): new more detailed XML description compared to the previous one, the DTD

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CIF	Common Intermediate Format
CU	Control Unit of an equipment
CUE	Current Using Equipment
D1	4 CIF
DGU	Data Gathering Unit
DTD	Document Type Definition
FTP	File Transfer Protocol
HTML	Hypertext Transfer Make-up Language
HTTP	Hypertext Transfer Protocol
IP	Internet Protocol
LAN	Local Array Network
PTZ	Pan/Tilt/Zoom
PTZ	Pan Tilt Zoom
QCIF	Quarter Common Intermediate Format
QVGA	Quart VGA
RTSP	Real Time Streaming Protocol
RTSP	Real Time Streaming Protocol
SDP	Session Description Protocol
SGML	Standard Generalized Markup Language
TCP	Transmission Control Protocol for IP
URL	Uniform Resource Locator
VGA	Video Graphics Array
XCU	XML enabled CU
XCU	XML enabled CU
XML	eXtensible Markup Language (see W3C)

4 Other utilities system

Other utilities system includes access control system and video monitor system which ensure the safety and reliability of telecommunication equipment.

Access control system is used to authenticate and control electronic lock. The main elements of access system are:

- secret key (inductive card, dactylogram, retina,…);

- access reader;

- access controller;

- electronic lock, which is depicted in figure 1.

Secret key keep user information, access reader receive and decrypt user information, access controller receive decrypted data from access reader, and control the on/off of electronic lock after authentication.
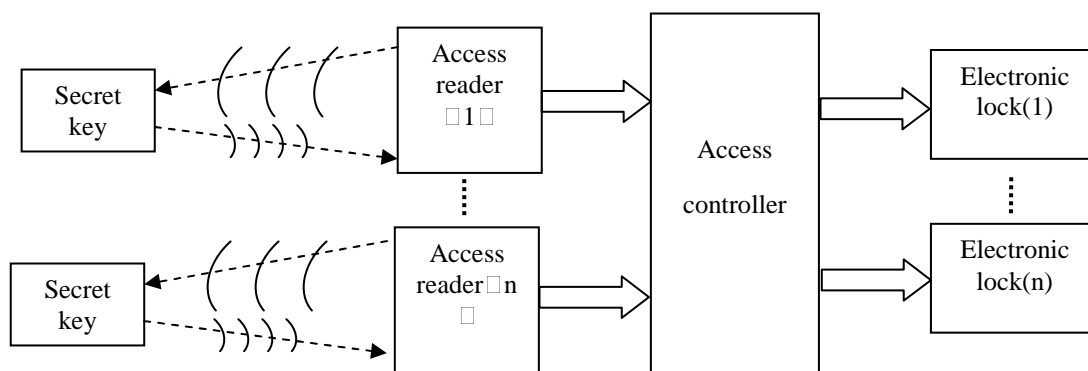
Figure 1: Access control system

Video monitor system includes control system, video encoder and camera which is depicted in figure 2. Camera capture analog video signal, video encoder encode analog signal to digital video code such as H.264, H.263, Mpeg4, etc., control system includes RTSP server, FTP server and PTZ control signal. RTSP server create and transfer stream media, FTP server transfer record file of video and picture.

The present document only describe the SDP file of RTSP server compliance to RFC 4566 [2] and FTP server URL with XML language.
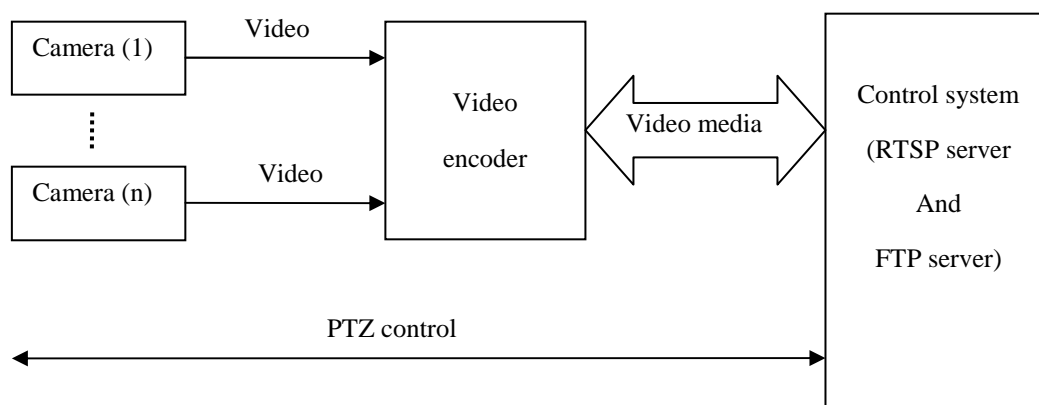
Figure 2: Video monitor system

Table A.1 (Table Environment in annex A) corresponds to access control system mandatory data that shall be provided for different types of equipment rooms environment monitor, and table B.1 (see annex B) includes data that should be provided in addition to mandatory one.

Table A.2 (Table Environment in annex A) corresponds to video monitor system mandatory data that shall be provided for different types of equipment rooms environment monitor, and table B.2 (see annex B) includes data that should be provided in addition to mandatory one.

Annex A (normative):
Summary of mandatory monitoring/supervision information and functions

This annex gathers the information needed on the Remote Monitoring Application for different types of building environment. It specifies the mandatory requirements that must be provided in all cases.

When an optional alarm that requires a parameter set is present, the corresponding parameter set is mandatory in the control section in order to allow remote adjustment under appropriate login procedure..

According to their types (Description, Alarm, Data, etc.), as defined in ES 202 336-1 [1] the information shall be provided by the Control Unit (XCU).

> NOTE: If there is no XCU this data will be provided by the Data Gathering Unit (DGU).

When a CU has a field bus connected to the DGU, at least, the DGU shall store data (record measurements, log files). The XCU which has the XML interface over Ethernet TCP/IP, shall store these data.

A.1   Other utilities system

A.1.1   Table for access control system

Table A.1: Minimum set of monitored information

Type	Monitored information	Explanation
description	Access system information	
alarm	Door open timeout	Door open time exceed configured time
	Partial network failure (high error rate, XCU-DGU link fault, etc.)	
	XCU reset	
event	Door open/close	
	Alarm setup and clear	
data	None	
data record	Open door record	Who at what time open door
config	Add user	User data format: card ID, password, door rights list
	Delete user	
	Setup system date and time	
control	Open/close door	
	XCU program download with default to previous release	
	All XCU alarm/event/test/command parameters (time-out, counter, thresholds, …) if any	
	Default values resetting (safe value for XCU)	

A.1.2   Table for video monitor system

Table A.2: Minimum set of monitored information

Type	Monitored information	Explanation
description	Video Monitor system information	
alarm	Partial network failure (high error rate, XCU-DGU link fault, etc.)	
	XCU reset	
event	None	
data	The SDP URL for RTSP request	
	FTP server URL	
data record	None	
config	Video codec (H.263, H.264, Mpeg4, Mjpeg, etc.)	
	Video format (QCIF, CIF, D1, QVGA, VGA, etc.)	
control		
	XCU program download with default to previous release	
	All XCU alarm/event/test/command parameters (time-out, counter, thresholds, …) if any	
	Default values resetting (safe value for XCU)	

Annex B (informative):
Summary of non-mandatory monitoring/supervision information and functions

According to their types (Description, Alarm, Data, etc.), as defined in ES 202 336-1 [1] the information is be provided by the Control Unit (XCU) or by the Data Gathering Unit (DGU).

The non mandatory information of a table TPnx (n being the N° of the table) are provided in addition to the mandatory information defined in annex A in table A.n.

B.1   Access control system

Table B.1

Type	Monitored information	Explanation
description	additive information	
alarm	System reset alarm	Controller reboot
	System soft reset alarm	Data clear and reset
	Power supply failure	when outside power failed, battery supply power to controlled to detect the alarm
	Access reader damaged	
	Invalid secret key (invalid region, password, time, etc.)	
event	None	
data	None	
data record	None	
config	Region accessed user list	
	User list	User's secret key information
	Door open strategy data	Door open strategy format: strategy ID, door open time, door close time, door list (door 1 to door 128, can be set by subsection)
	Set up user access time	user access time limitation
	Users valid region change	Change user's power to open which door
control	Open door	

B.2   Video monitor system

Table B.2

Type	Monitored information	Explanation
description	additive information	
alarm	None	
event	None	
data	None	
data record	None	
config	None	
control	Brightness	The range is 0 to 255
	Contrast	The range is 0 to 255
	Hue	The range is 0 to 255
	PTZ(Pan/Tilt/Zoom) Control□up□down□left□right□zoom/in/out/ □aperture ++/-- □auto scan start/stop□auxiliary open/close□preset set/go to □	All command need to indicate the channel NO, the preset command need to indicate the preset NO
	Capture picture	Need to indicate the channel NO
	Record Video start/stop	Need to indicate the channel NO

Annex C (normative):
Mandatory XML structure and elements

C.1   Structure of an XML document for other utilities system

In the site DGU XML data structure as described in ES 202 336-1 [1], access control system or video monitor system is always a child of a site other utilities system.

The XML structure shall be as follows:

- indicate precisely the generic mandatory XML structure;

- and where to put the information if it exists (where it starts and stops).

Every equipment and element, should be considered as a folder in the XML structure.Probably we do not need to repeat what is in ES 202 336-1 [1] (site id, …), just focus on other utilities system.

```
<site id="23" status ="normal">
....
        <other_utilities_system id="3" status="normal">
            <description_table>
          …
          </description_table>
            …
          <access _system id="1" status="normal">
             <description_table>
             …
             </description_table>
             <alarm_table>
             …
             </alarm_table>
             <event_table>
             …
             </event_table>
             <data_table>
             …
             </data_table>
             <data_record_table>
             …
             </data_record_table>
             <config_table>
             …
             </config_table>
             <control_table>
             …
             </control_table>

           </access _system >

          <video_system id="3" status="normal">
            …
</ video_system>
            ….
        </ other_utilities_system>
    …
</site>
```

Other utilities system XCU will only generate the XML document "other utilities_system.xml". This file can be downloaded by the DGU of the site and embedded in the "site.xml" document. In this case, the structure of the present document is as follows:

```
<other utilities_system id="3" status="normal">
    <access_system id="1" status="normal">
          <description_table>
        …
        </description_table>
        <alarm_table>
        …
        </alarm_table>
        <event_table>
        …
        </event_table>
        <data_table>
        …
        </data_table>
        <data_record_table>
        …
        </data_record_table>
        <config_table>
        …
        </config_table>
        <control_table>
        …
        </control_table>
</access_system>
    <video_system id="2" status="normal">
          <description_table>
        …
        </description_table>
        <alarm_table>
        …
        </alarm_table>
        <event_table>
        …
        </event_table>
        <data_table>
        …
        </data_table>
        <data_record_table>
        …
        </data_record_table>
        <config_table>
        …
        </config_table>
        <control_table>
        …
        </control_table>
</ video system>
</ other_utilities_system>
```

Annex D (informative):
Examples of XML elements for other utilities system

D.1   The \<description\> elements of other utilities system

Here follows some examples of description elements.

This means that the ANNEX A data are mandatory, but not the XML coding, and the existence of the data in the XML file has to be checked.

Name	Group	Description
Manufacturer Name	Manufacturer	The name of the manufacturer
Product Name	Manufacturer	The commercial name of the product
Short Description	Manufacturer	A short description of the product written by the manufacturer
Reference	Manufacturer	The internal manufacturer reference of the equipment/system e.g. ordering code
Serial Number	Manufacturer	The serial number of the system/equipment

EXAMPLE:

```
<description_table>
<description id="1" name ="Manufacturer Name" group="Manufacturer">Best Manufacturer</description>
    …
<description id="4" name ="Serial Number" group="Manufacturer">45623-5F-EG</description>
        …
<description id="10" name ="Reference" group="User">SEP1245- other utilities </description>
</description_table>
```

D.2   The \<alarm\> elements of access control system

Here follows some examples of alarm elements.

```
<alarm_table>
   <alarm id="1" active="false" name=" System reset alarm " severity_type="major"
severity_level="6"/>
   <alarm id="2" active="false" name=" System soft reset alarm " severity_type="major"
severity_level="6"/>
   <alarm id="3" active="false" name=" Outside power supply failure " severity_type=" major "
severity_level="4"
   <alarm id="4" active="false" name=" Access reader damaged " severity_type=" major "
severity_level="4"/>
   <alarm id="5" active="false" name=" Invalid secret key " severity_type="minor"
severity_level="6"/>

</alarm_table>
```

D.3   The <event> elements of access control system

Here follows some examples of event elements.

```
<event_table>
  <event id="1" datetime="2008-06-15T10:50:43" door="NO 1" status="alarm setup"> invalid secret key
entrance </event>
   <event id="2" datetime="2008-06-15T15:50:58" door =" NO 1 " status="alarm clear "> invalid secret
key entrance </event>
    <event id="3" datetime="2008-06-15T21:50:43" name="Lily" status="normaly"> valid secret key
entrance </event>
    <event id="4" datetime="2008-06-15T21:50:58" name="Lily" status=" normaly "> valid secret key
exit </event>
            ...
</event_table>
```

D.4   The <data_record> elements of access control system

The structure of the data record is really manufacturer dependent and is free.

D.5   The <config> elements of access control system

Here follows some examples of config elements.

```
<config_table>
   <config id="1"name=" Add user" access reader="NO 5" group=" user " >0001</config>
   <config id="2" name=" Delete user" access reader="NO 1" group=" user " >0005</config>
   <config id="3" name=" system date and time " group=" time">2008-06-15T10:50:43</config>

</config_table>
```

D.6   The <control> elements of access control system

Here follows some examples of control elements. Writing a '1' to the "innertext" of these elements start the control function.

```
<control_table>
   <control id="1" name=" Open door " group=" door "/>

</control_table>
```

D.7   The <data> elements of video monitor system

Here follows some examples of data elements.

```
<data_table>
<data id="1" channeid="1" name =" image SDP URL " group=" image"  URL >rtsp://ip
address:port/xxx/xxx.sdp </data>
<data id="2" channeid="2" name =" image SDP URL " group=" image"  URL >rtsp://ip
address:port/xxx/xxx.sdp </data>
<data id="3" channeid="X" name =" image SDP URL " group=" image"  URL >rtsp://ip
address:port/xxx/xxx.sdp </data>
 <data id="4" name=" record ftp URL " group=" image "  URL >ftp://ip address:port </data>
   </data_table>
```

D.8   The \<config\> elements of video monitor system

Here follows some examples of config elements.

```
<config_table>
   <config id="1" name=" Video format " group=" Format "> CIF </config>
   <config id="1" name=" Video Codec " group=" codec "> h.264 </config>
…

</config_table>
```

D.9   The \<control\> elements of video monitor system

Here follows some examples of control elements. Writing a '1' to the "innertext" of these elements start the control function.

```
<control_table>
   <control id="1" name=" Brightness ++ " group=" brightness "/>
   <control id="2" name=" Brightness -- " group=" brightness "/>
   <control id="3" name=" Contrast ++" group=" contrast "/>
   <control id="4" name=" Contrast -- " group=" contrast "/>
   <control id="5" name=" Hue ++" group=" hue "/>
   <control id="6" name=" Hue -- " group=" hue "/>
<control id="7" Channel id = "1" name=" PTZ up" group=" PTZ Control "/>
<control id="8" Channel id = "1" name=" PTZ down" group=" PTZ Control "/>
<control id="9" Channel id = "1" name=" PTZ left" group=" PTZ Control "/>
<control id="10" Channel id = "1" name=" PTZ right" group=" PTZ Control "/>
<control id="11" Channel id = "1" name=" PTZ zoom in" group=" PTZ Control "/>
<control id="12" Channel id = "1" name=" PTZ zoom out" group=" PTZ Control "/>
<control id="13" Channel id = "1" name=" PTZ aperture ++" group=" PTZ Control "/>
<control id="14" Channel id = "1" name=" PTZ aperture --" group=" PTZ Control "/>
<control id="15" Channel id = "1" name=" PTZ auto scan start" group=" PTZ Control "/>
<control id="16" Channel id = "1" name=" PTZ auto scan stop" group=" PTZ Control "/>
<control id="17" Channel id = "1  auxiliary id="1" name=" PTZ  auxiliary open" group=" PTZ Control
"/>
<control id="18" Channel id = "1" auxiliary id="1"  name=" PTZ auxiliary  close" group=" PTZ Control
"/>
<control id="19" Channel id = "1"  preset = "2" name=" PTZ  set preset" group=" PTZ Control "/>
<control id="20" Channel id = "1"  preset = "2" name=" PTZ  go to preset" group=" PTZ Control "/>
<control id="21" Channel id = "1"  preset = "2" name=" PTZ  set preset" group=" PTZ Control "/>
<control id="22" Channel id = "1"  name=" capture picture " group=" record data "/>
<control id="23" Channel id = "1"  name=" record video start " group=" record data"/>
<control id="24" Channel id = "1"  name=" record video stop " group=" record data"/>

</control_table>
```

Annex E (informative):
Bibliography

ETSI TR 102 336: "Environmental Engineering (EE); Power and cooling system control and monitoring guidance".

IETF RFC 2326: "Real Time Streaming Protocol".

IETF RFC 959: "File Transfer Protocol".

History

Document history			
V1.1.1	October 2009	Membership Approval Procedure	MV 20091211: 2009-10-13 to 2009-12-11