

BINARY SPACE

RELIABLE SPACE SYSTEMS

SatView™ Automation Interface

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Table of Contents

1. Introduction
2. Interface Architecture
3. Service Mechanism
4. Automation Requests
5. Automation Request Responses
6. Implemented Services
7. Samples

Appendix

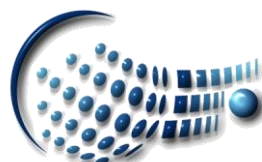
- A. Encryption

Table of Figures

Figure	Description
Figure 2.1.	SatView™ Interfaces (exposed to third-party developers)
Figure 3.1.	SatView™ Automation Service Mechanism
Figure 3.2.	SatView™ Automation Service P2P Connection

Document Change Log

Issue	Revision	Date	Affected	Reason for change
1	0	October 2012	All	New document
1	1	November 2012	Appendix A	Added encryption details
1	2	November 2012	Chapter 6	New service added Changed operating mode names



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1. Introduction

SatView™ exposes important interfaces to third-party developers which allow an effective customization of the product.

The following areas can be subject of such an extension:

- **Data I/O**

Writing data I/O device drivers can make SatView™ compatible to any available TM/TC front-end equipment.

- **Database**

Multiple database standards can be supported by developing database drivers which make a migration of SatView™ to new missions possible in a flexible way.

- **Automation**

Offers an interface to all automation services of SatView™; ideal for the integration into complex and highly automated ground segments.

This document focuses on the automation interface.

2. Interface Architecture

By exposing important interfaces to third-party developers, customers can adapt SatView™ to their current environment in a flexible way:

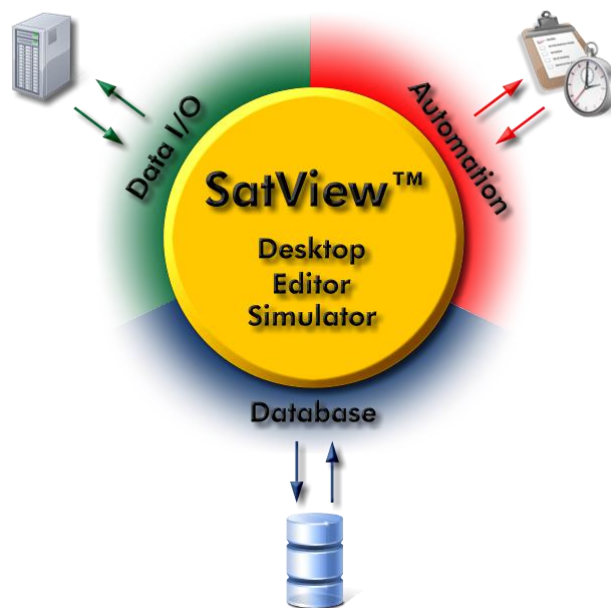
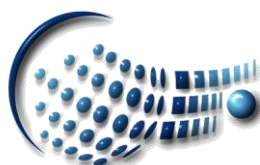


Figure 2.1. – SatView™ Interfaces



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The work includes the development of an interface driver in form of a *Dynamic Link Library* (DLL) for the Data I/O and the database; the automation is performed through XML-formatted requests via TCP/IP.

3. Service Mechanism

SatView™ exposes many of its services to remote users via an automation interface. In principle, a user asks for such a service by sending a corresponding request to SatView™ and waits for a response indicating whether the request was accepted or not:

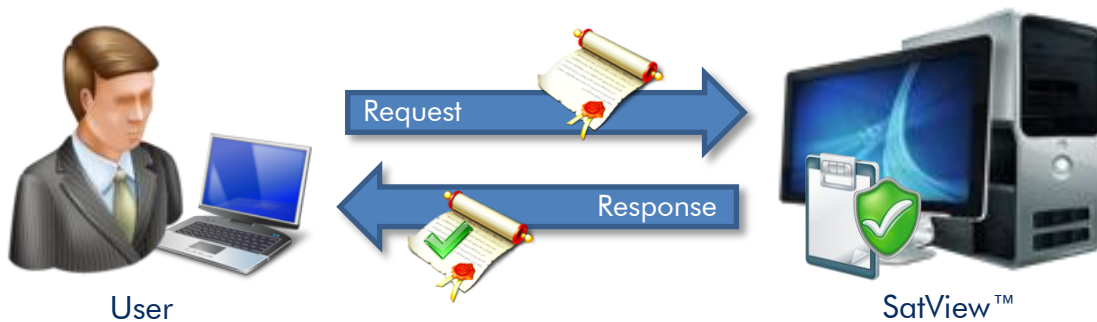


Figure 3.1. – SatView™ Automation Service Mechanism

Such an automation request could for example be the setup of a notification procedure informing the user by e-mail about a telemetry parameter exceeding its limits. Another user could maybe ask for periodic statistical reports to be sent to a certain address. Any user taking advantage of this automation service must have been previously registered by a user name and password. Furthermore, all tasks that might be requested by that user must also be specified at registration time. The communication is performed on top of TCP/IP and consists in general of XML-formatted data being exchanged.

Automation requests are issued by opening a socket connection to the SatView™ workstation and by sending the request data in the format specified in a later chapter. A reply will indicate if the request was accepted or not.

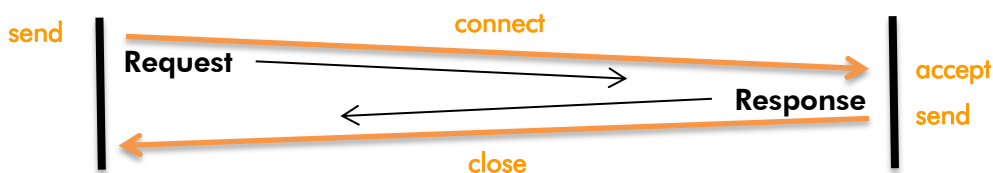


Figure 3.2. – Automation Service P2P Connection



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An error message will be returned if a failure occurred or a request rejection happened. After the request response the socket will be closed automatically by the SatView™ workstation. Automation requests can be issued as Unicode or ASCII encoded strings.

4. Automation Requests

Once a connection is established the automation request data can be supplied. That data has to follow a certain syntax which is explained hereafter.

4.1. Request Syntax & Tags

Each request must contain at least these tags:

```
<Automation Request>
  <Client>
    <Name>Name</Name>
    <Password>Password</Password>
  </Client>
  <Service>
    <Name>Name</Name>
  </Service>
</Automation Request>
```

This request identifies the user and simply requests the service *Name* to be executed immediately.

There is a variety of tags available allowing for the specification of more sophisticated requests.

4.1.1. Optional Service-related Tags

Some services support these additional tags:

```
<Execution>
  [<Start Time>Start Time</Start Time>]
  [<Stop Time>Stop Time</Stop Time>]
  [<Repetitions>Repetition Count</Repetitions>]
</Execution>
<Parameters>
  {Pi="text" | number{, Pj="text" | number}}
</Parameters>
```



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Legend:

[x]: x occurs zero or one time Times are in seconds since January 1st, 1970
{x}: x occurs zero or more times | : OR

5. Automation Request Responses

When a request has been processed by SatView™, the client is notified whether it was accepted or not. This is done by a response that follows this syntax:

5.1. Response Syntax & Tags

Each response contains at least these tags:

```
<Automation Request Response>
  <Service>
    <Name>Name</Name>
    <Acceptance>
      <Status>Status</Status>
    </Acceptance>
  </Service>
</Automation Request Response>
```

Status: Successful | Failed | Denied

As with the requests there are optional tags available mainly related to the returned error message.

5.1.1. Optional Service-related Tags

Some services support these additional tags:

```
<Acceptance>
  [<Message>Message</Message>]
</Acceptance>
```

Message: Any human readable text dependent on the service and the request response.



6. Implemented Services

In a first release only a very limited set of services is exposed through the automation service. However, this chapter will be updated alongside the growing number of services implemented.

6.1. Operating Modes

This service allows the switching between supported operating modes.

```
<Automation Request>
  <Client>...</Client>
  <Service>
    <Name>Switching between operating modes</Name>
    <Parameters>
      Mode="New Operating Mode"
    </Parameters>
  </Service>
</Automation Request>
```

New Operating Mode: Standby | Active | Passive | Maintenance | Final

Note:

The 'Switching between operating modes' service does not support the **<Execution>** tag.

6.2. Configuration Settings

This service flushes the configuration settings to the registry database or re-loads them.

```
<Automation Request>
  <Client>...</Client>
  <Service>
    <Name>Saving configuration settings</Name>
    [<Parameters>
      Subsystems="List of sub-systems"
    </Parameters>]
  </Service>
</Automation Request>
```



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```
<Automation Request>
  <Client>...</Client>
  <Service>
    <Name>Loading configuration settings</Name>
    [<Parameters>
      Subsystems="List of sub-systems"
    </Parameters>]
  </Service>
</Automation Request>
```

List of sub-systems: Component{,Component}

*Component: Telemetry Service | Telecommand Service | Memory Dumps Service |
TPEP Service | PFLP Service | Automation Service |
System Alerts | Telemetry Events | Telemetry Reports |
Print Profiles | Audition Profiles | Notification Profiles | Download Profiles |
Log-in Schedule*

Note:

- If the **<Parameters>** tag is omitted all configuration settings are saved or re-loaded.
- The 'Saving configuration settings' and 'Loading configuration settings' service do not support the **<Execution>** tag.

6.3. System Health

This service checks if the major threads are running as expected or returns the status of the telemetry data provider device or telecommand data uplink device.

```
<Automation Request>
  <Client>...</Client>
  <Service>
    <Name>Checking system health</Name>
    [<Parameters>
      Device="Device type"
    </Parameters>]
  </Service>
</Automation Request>
```

Device type: TM | TC

Note:

- The **<Execution>** tag is not supported by the 'Checking system health' service.



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In the case where the request is successful the corresponding service response includes a **<Message>** tag containing the following values:

- When no **<Parameters>** tag is specified: Good | Bad.
- In the other cases it returns the status of the specified device.

7. Samples

The following request asks SatView™ to switch to 'Maintenance' mode:

```
<Automation Request>  
  <Client>  
    <Name>MOC</Name>  
    <Password>123456</Password>  
  </Client>  
  <Service>  
    <Name>Switching between operating modes</Name>  
    <Parameters>Mode="Maintenance"</Parameters>  
  </Service>  
</Automation Request>
```



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Appendix

A. Encryption

Parts of the data communication can be encrypted to protect a user's credentials. In that case the encrypted password is expressed as a string of hexadecimal digits.

For the encryption the *Microsoft® Base Cryptographic Provider* is used. It is a general-purpose cryptography provider that supports digital signatures and data encryption.

Provider name: MS_DEF_PROV

Provider type: PROV_RSA_FULL

Hashing algorithm: CALG_MD5

Encryption algorithm: CALG_RC2

The session key for encryption/decryption can be obtained by creating a hash object with the client's password (encoded as multi-byte string) added as base data to it.



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