

## Technical Data Sheet: imc SEARCH 3.1

Edition 2

Database application for structured storage and administration of measurement data:

- Measurement data (measurement values, measurement series, combined data from multiple measurement channels)
- Metadata (additional information on measurements, measured data and test objects)
- Files containing additional information.

<b>Order code</b>	<b>Article number</b>
<b>SEARCH-MOBILE</b>	1010175
<b>SEARCH-SERVER</b>	1010176
<b>SEARCH-SERVER-STARTER</b>	1010177
<b>SEARCH-CLIENT</b>	1010178

## Topology

imc SEARCH consists of the following components:

- imc SEARCH Server: Server in a distributed Client/Server arrangement,
- imc SEARCH Client: Client in a distributed Client/Server arrangement,
- imc SEARCH Mobile: Everything installed on one computer.

Additional components are tools used to access and work with the database, particularly for imc FAMOS as a SEARCH-Client, as well as to perform configuration of the Server (e.g., database model etc.):

- imc SEARCH Browser for FAMOS: viewing the database content in imc FAMOS
- imc SEARCH Kit for FAMOS: accessing the database with imc FAMOS sequences
- imc SEARCH Administrator: managing the database

### Database-Management-System (DBMS)

imc SEARCH is a database application. Reading and editing the model contents is implemented as accessing of the Database-Management-System (DBMS).

imc SEARCH requires a DBMS. Supported DBMS's:

- Microsoft SQL Server
- Oracle
- MySQL
- Microsoft SQL Server Compact Edition 4.0 (only with imc SEARCH Mobile).

### Data repository / file-server

A directory for data storage (or a file-server, for instance) is explicitly specified, since the mass data are not saved in the DBMS. This separation, or rather the management of what are purely links to the mass data in the DBMS, offers substantial advantages in terms of performance.

### Storage location

- Mass data and file attachments: in the file system
- Metadata: in the database

### Client/Server operation

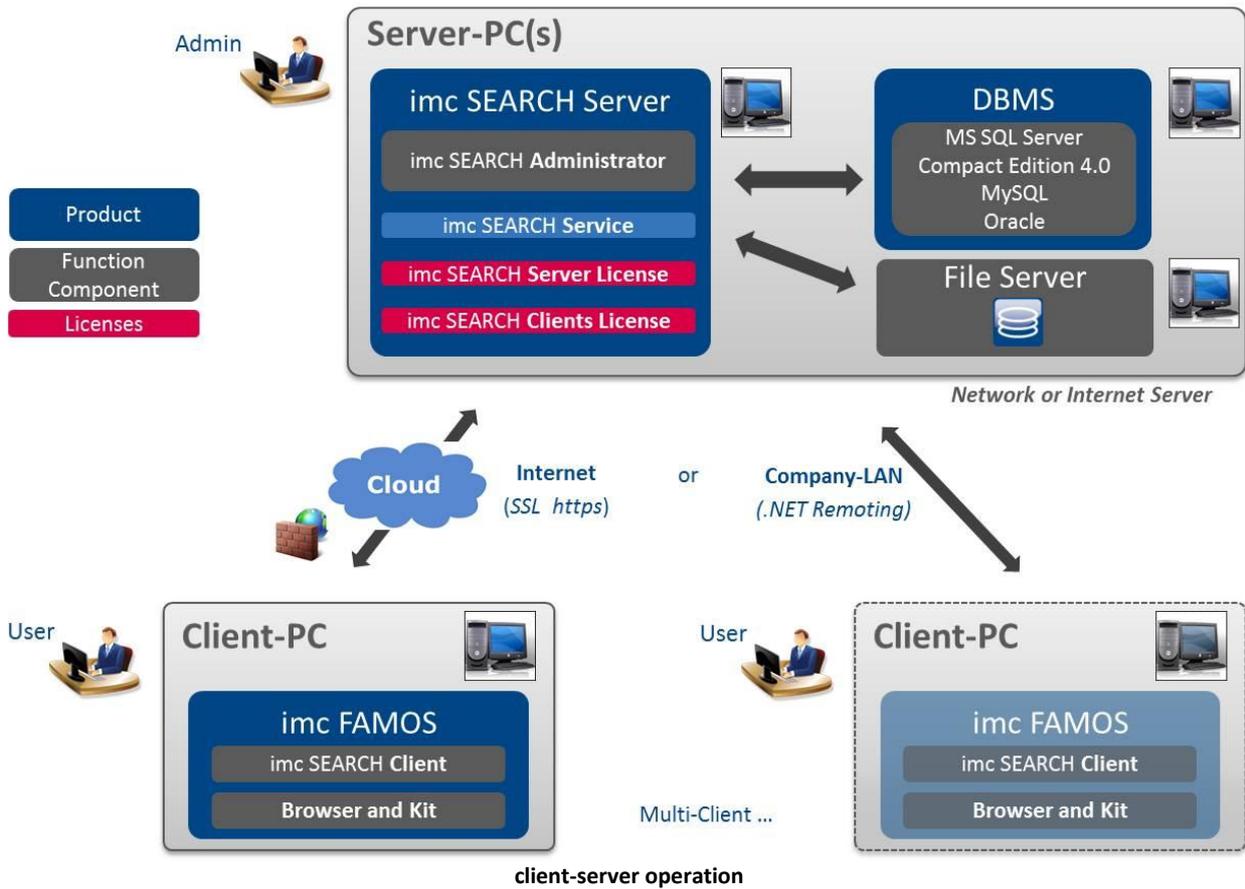
Typically, multiple users/computers work with imc SEARCH. The data management is centrally organized and decoupled.

### imc SEARCH Server

- Runs as a service on a server-computer.
- The DBMS runs either on the same or on a different server-computer.
- The directory of the mass data is located either on the same or on a different server-computer.
- The imc SEARCH Service is connected to the DBMS and the mass data storage directory and organizes communication and data exchange.
- The underlying DBMS is conveniently set up and administered by the imc SEARCH Administrator at a high level of abstraction.

**imc SEARCH Client**

- imc SEARCH Client runs on spatially-distributed client-computers. The client-computers connect themselves with the imc SEARCH Server, through the use of appropriate communication protocols, in accordance with the respective network infrastructure used:
- in the secured company LAN: via .NET Remoting
- via Internet: secured SSL/https communication (across firewall boundaries)

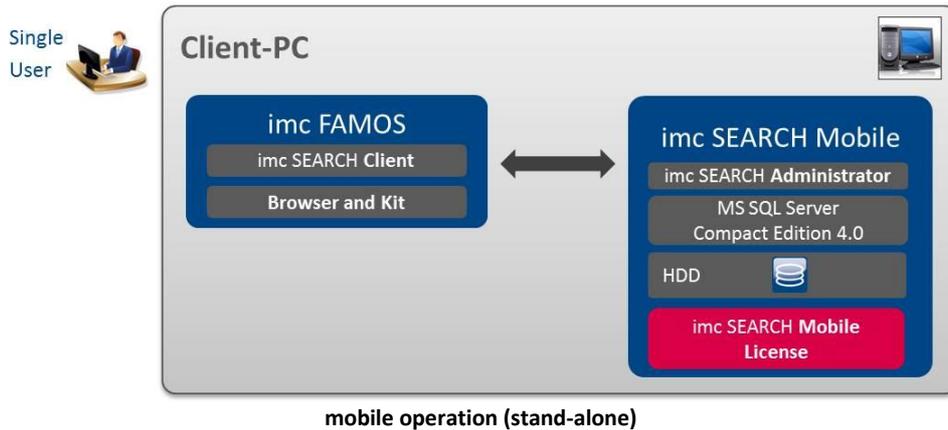


### imc SEARCH Mobile

A individual user works with imc SEARCH in a "stand-alone" mode.

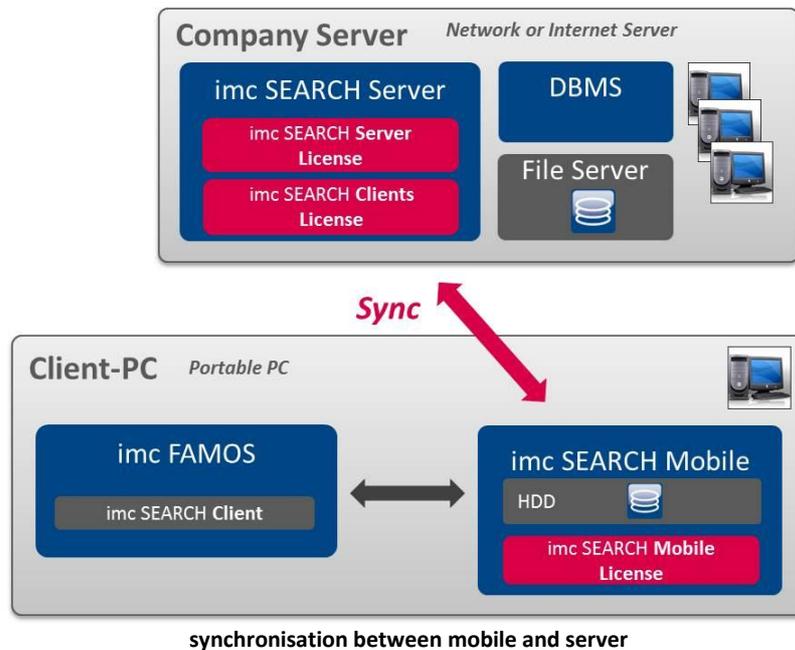
#### Integrated complete solution

- Combined installation on one computer.
- Access to the data only from this computer.
- DBMS (Microsoft SQL Server Compact Edition 4.0) and the directory of mass data are also on this computer.
- The DBMS has a variety of constraints regarding the database size.



imc SEARCH Mobile contains the functions of imc SEARCH Client and thus alternatively enables connection with a central imc SEARCH Server. This capability can be used in cases of autonomous operation to synchronize with a server (for instance, at regular intervals), in other words, to correlate database contents.

While the local "mobile"-license allows stand-alone operation, for synchronization purposes, the server-based license is used.



## Data model

Storage of data is performed on the basis of a model, which is based on the ASAM ODS model. The model consists of elements, which possess attributes and relations. There are elements for storage of experiments, measurements, measurement channels, test objects, measurement devices, and users.

Attributes determine which properties an element possesses. They can be freely defined.

By means of relations, the elements can be related to each other, for example, to set which test object is used in which measurement.

The measurement channels are stored in the file system. They are linked with the measurement channels element.

### Hierarchy

Level/Types:

- Projects
  - Experiments
    - Measurement
      - Channels
  - Test objects
  - Measurement devices
  - Users
  - User groups
  - Repository for files

Any desired subfolders can be set up for structuring assortments of projects, test objects, measurement devices, and for the Repository.

Channels include: measurement channels, virtual channels, calculation results, video channels, voice channels.

Multiple types of measurements, test objects, measurement devices are possible.

### Attributes

For each element, attributes are defined. Each attribute has a name, data type and may have a derivation from a base attribute, and possibly a value range.

Each element has base attributes; at least an ID and name.

### Data types

- Text
- Integer: 1 Byte unsigned, 2, 4, 8 Bytes signed
- Boolean: 1/0
- Real numbers: 4, 8 Byte
- Time stamp: UTC, local time zone
- Enumeration: List of texts encoded as a number

### Relations

- Parent-Child
- 1:N
- M:N

### **Maintenance of the model**

The model may be adapted over the course of its lifetime. Expansions such as new attributes and new types are always possible. When deleting an attribute, its instance values are also deleted.

### **File attachments**

To each subfolder and each instance in the database such as experiment, measurement, channel, test object, etc., it is possible to assign files such as pictures, documentation,....

### **File folder**

Creation of folders as in the Windows Explorer. Instances of projects, experiments, test objects, measurement devices can be created in freely-define subfolders for direct navigation.

### **Repository**

For storing files which relate to experiments, measurements and their evaluation, and which alongside with the test data can also be exchanged between users, but which are not assignable to any specific measurement or test object, such as device configurations, instrument settings, sequences, analyses, reports. Arrangement of the data with subfolders as in the file system.

### **Traceability of measurements**

Experiment/Measurement/Channel-hierarchy enables direct traceability  
Storage of time-stamped versions with file attachments

### **Analyses**

For example, for automated post-processing.

- Starting an imc FAMOS sequence in response to specific events (particularly, arrival of new data).
- Running of analyses at specific times.
- Execution of the imc FAMOS sequences is performed on the imc SEARCH Server.

### **User administration**

Determines which users may have access to the database.

- user groups
- access privileges: each element, attribute or instance can be protected by assigned privileges.
- Role-based assignment of privileges, only relevant for imc SEARCH Server

### **Import, Export**

Import and Export of the entire database and selected structures:

- entire model (schema, instances, file attachments)
- selected elements of the model
- hierarchy of elements, e.g., experiment, measurement, measurement values

## imc FAMOS linkage: imc SEARCH Browser

A browser available in imc FAMOS (Edition: Standard, Professional, Enterprise) along with the File-Browser

- tree-diagram representation of the hierarchy
- element properties in tabular form
- element contents (list of elements) in tabular form
- adding and deleting of instances
- changing of element attribute values
- adding and deleting of file attachments
- transfer to the imc FAMOS Variables list:
  - elements and their attributes
  - channels
  - measurements along with their channels

### View

Display of an element in the tree diagram

- data sheet view in tabular form with the element's properties
- Tabular view of instances belonging to the element in the tree diagram. E.g. list of all measurements, when an experiment is selected in the tree. Selectable and positionable columns, sorting according to one column.
- Preview: view containing a curve window, in order to see the data of a selected channel with having previously transferred it to the Variables list.
- view for displaying the file attachments

Views are recorded by imc SEARCH automatically and individually for each user.

Multiple views of one element in the tree diagram are possible.

### Filters

Filters for each view containing a list of instances

- filter conditions editable
- filter conditions composed of an attribute, a comparison function, a comparison value. Comparison functions: >, <, =, <>, LIKE
- multiple filter conditions combinable with AND/OR
- Filters are recorded by imc SEARCH together with the views.

### Queries

- all queries in a separate folder
- Queries comprise the type to be queried, the selection of attributes to be queried, and a search condition. Editing of the search condition like for a filter.
- private and public queries

## imc FAMOS linkage: imc SEARCH Kit

Access to imc SEARCH from within imc FAMOS (Edition: Standard, Professional, Enterprise, Runtime) sequences

- Database linkage  
Login with default entries, login with connection dialog, log out, re-load.
- Finding instances  
Search by type, search by path, search using condition, search by relation.
- Instance attributes  
Setting, querying, polling a list of attributes.
- Instances  
Create, create with template, delete
- Channels and measurements  
Read channel, write channel, write group, read measurement including channels
- Relations  
Setting, adding, deleting
- File attachments  
Finding IDs, reading properties, read file, write file, delete
- Error  
Get error code, get error text

## Administration

Administration tool provided for the following tasks:

- Editing of the model  
Toward this end, a Model-Editor is implemented, by means of which elements, attributes and relations can be added, edited or deleted.
- User administration  
Overview of registered users.  
Sets up users who are permitted access to the model.  
Allocation of privileges can be organized through assignment to user groups.
- Access rights  
Each element, attribute or instance can be protected by means of rights. A Rights Editor is provided for the purpose of setting up the rights scheme.
- Service configuration  
For the service imc SEARCH Server running on the server computer.
- Data sources  
Connection to the DBMS
- Query Editor  
Low Level SQL queries to the DBMS
- Porting  
Import and export of the model  
Selectively for model and contents

**Languages**

German, English

**Compatibility**

imc FAMOS 7.0 or higher

**Platform**

- as 32-bit program on 32-bit operating systems and optionally on 64-bit operating systems
- as 64-bit program on 64-bit operating systems

**System prerequisites****imc SEARCH:**

- Windows 10 (64 bit)
- Windows 8, 8.1 (64 bit)
- Windows 7 (32 bit, 64 bit)
- Windows 2008 Server R2
- Windows 2012 Server
- Windows 2016 Server

**imc SEARCH Server:**

One of the following DBMS's:

- MS SQL Server 2005, 2008
- Oracle 10g, 11g, 12c
- MySQL

**imc SEARCH Mobile:**

Microsoft SQL Server Compact Edition 4.0 (included in installation)

**With imc FAMOS Integration:**

For *imc SEARCH Mobile* and *imc SEARCH Client*:

imc FAMOS Reader, Standard, Professional, Enterprise

For *imc SEARCH Server*:

imc FAMOS Professional, Enterprise

**Licensing****imc SEARCH Server:**

License for the server in a Client/Server-arrangement

The license for the DBMS is not included.

**imc SEARCH Clients:**

License for the client in a Client/Server-arrangement.

One license for each imc SEARCH Server user registered by name.

Licensing of the connected clients is handled on the server-side!

**imc SEARCH Mobile:**

License for stand-alone operation

**For all imc SEARCH licenses:**

No second activation

**Scope of delivery**

Data carrier with installation, sample database and documentation as pdf-file