

# Lenex 2.0 - Technical documentation

An international data exchange format for swimming

## 1. General

A "Lenex" file is a XML file with some additional constraints, which cannot be defined with an XSD schema. Because of this, and to give programmers an easier to read document with additional information on the format, we have put together this "non-standard" kind of documentation for you. Additionally, there is an online checker at <http://www.swimrankings.net/lenex/> to check a Lenex file against all constraints. An XSD schema will be available at <http://www.swimrankings.net/files/Lenex20.xsd>.

The Lenex 2.0 format is based on Lenex 1.0, but there is no direct compatibility between the two formats. However, the basic structure of events, entries and results data is the same. At the end of this document, you can find a more complete list of changes from Lenex 1.0 to 2.0. Generally the following changes were made:

- \* Added new sub trees for record lists and time standards.
- \* Added and refined existing objects for entries and results.
- \* Some of the key words were renamed in order to have them in a more accurate English and to avoid short named unclear identifier.
- \* Some data types were changed in order to have no country specific separators anymore.
- \* Some of the key words in enumerations were changed to remove unclear short abbreviations.
- \* All basic types are specified as attributes now. Entities are used for complex data types only.

The items in a Lenex file fall into three categories:

- \* Objects: An object contains any number of child objects and attributes.
- \* Collections: A collection is an object that contains objects of one type only. By default, the collection will be given the plural name of the object name it contains (e.g. SESSIONS contains SESSION objects). In most cases, the objects contained in a collection have at least one required attribute for identification purposes (e.g. attribute "distance" for object SPLIT).
- \* Attributes: Attributes contain data in one of the basic Lenex data formats. The recognized formats are documented in the chapter "Lenex data types". Attributes can be attached to objects or to collections.

## 2. Lenex files

A Lenex file is a XML file with the extension **.lef**. Usually, Lenex files are compressed (in the ZIP file format) and are labeled with the extension **.lxf**. A Lenex file can contain all kinds of data at the same time. However, when exchanging data, the following files with a subset of possible objects are commonly used:

- \* Invitation: An invitation file contains general information, the schedule and the event structure of one meet. Additionally, it could be necessary or helpful to add time standards and/or qualification times, which are important for the meet.
- \* Entries: An entry file contains the entries for one meet. One file might contain the entries of one club only, or it can contain all entries of all clubs.
- \* Results: A result file contains the results of one meet. Normally, it contains all results of all clubs, but it is possible to split the results for each club into a separate file.
- \* Records: A record file contains one or more list(s) of records.
- \* Time standards: A time standards file may contain different kinds of time standards and/or qualification times. It might make sense to store time standards in separate files, if they are independent of meets (e.g. Olympic A and B time standards). If the time standards are bound to a certain meet, they should be included in the invitation file of that meet.

### 3. Lenex tree

The following chapter is an overview of the Lenex structure. The first subchapter contains a tree with the most important objects. The other subchapters describe some of the sub trees in more details. To get the full information about objects and elements that are allowed or required, please refer to the chapter with the "Lenex object documentation".

#### 3.1. Tree overview

The following tree shows the most important objects in a Lenex tree.

LENEX	.....	The root of a Lenex file.
CONSTRUCTOR	.....	Information about the creator of the file.
MEETS		
MEET	.....	The root for a meet sub tree.
SESSIONS	.....	The schedule and event details of a meet.
CLUBS		
CLUB	.....	All data of one club at the meet.
ATHLETES		
RELAYS		
OFFICIALS		
RECORDLISTS	.....	The root for the record lists sub tree.
TIMESTANDARDLISTS	.....	The root for the time standard lists sub tree.

#### 3.2. Sub tree SESSIONS

The SESSIONS sub tree describes the entire event structure with prelims and final events and the age groups used for the result lists.

SESSIONS		
SESSION	.....	Data of one session with all its events.
POOL		
EVENTS		
EVENT	.....	Description of one event/round.
SWIMSTYLE		
AGEGROUPS		
AGEGROUP	.....	Details of one age group.
JUDGES		
JUDGE		Details about judges for a session.

#### 3.3. Sub tree ATHLETES

The ATHLETES sub tree contains all athletes of one club with their entries and/or results.

ATHLETES		
ATHLETE	.....	Data of one athlete.
ENTRIES		
ENTRY	.....	Entry for one event/round.
MEETINFO		
RESULTS		
RESULT	.....	Result for one event/round.
SPLITS		

### 3.4. Sub tree RELAYS

The RELAYS part is used to describe relay entries and results of one club. The relay swimmers are not stored directly in this tree. A unique id is stored in the tree in order to reference an athlete in the ATHLETES sub tree.

```
RELAYS
  RELAY .....Data of one relay team.
    ENTRIES
      ENTRY .....Entry for one event/round.
        RELAYPOSITIONS
        RELAYPOSITION
    RESULTS
      RESULT .....Result for one event/round.
        RELAYPOSITIONS
        RELAYPOSITION
      SPLITS
```

### 3.5. Sub tree RECORDLISTS

The sub tree RECORDLISTS is used to define all kind of records. One record list contains all records of a specific type (e.g. world records), gender and pool length (course). In this sub tree, the information about the athletes is represented by means of complete ATHLETE objects, and not just as a reference to some other sub tree.

```
RECORDLISTS
  RECORDLIST .....Data of one record list (type, gender, course).
    AGEGROUP
    RECORDS
      RECORD .....Data of one record (individual or relay).
        SWIMSTYLE
        ATHLETE
        RELAY
          RELAYPOSITIONS
          RELAYPOSITION
          ATHLETE
        MEETINFO
        SPLITS
```

### 3.6. Sub tree TIMESTANDARDLISTS

The sub tree TIMESTANDARDLISTS is used to define time standards and qualification times.

```
TIMESTANDARDLISTS
  TIMESTANDARDLIST .....Time standards (type, gender, course).
  TIMESTANDARDS
    TIMESTANDARD .....Data of one time standard / qual. time.
    SWIMSTYLE
```

## 4. Lenex object documentation

The following list is alphabetically ordered and describes the meaning and content of every object in a Lenex tree. Objects and collection names are in uppercase. Attribute names are in lowercase. The basic data types are described in chapter "Lenex data types". Objects can appear in different ways:

- \* Normal (-): Zero or one instance of an attribute/object is allowed.
- \* Required (r): Exactly one instance of an attribute/object is required.
- \* Multiple (m): There can be any number of instances of an objects (including zero). An attribute is always allowed once in maximum per object.

Every object or collection can have an attribute with the name "[objectname]id" (e.g. "athleteid" for the object ATHLETE). For some objects, this attribute is mandatory, because it is used to build relationships between objects in different sub trees. Attributes always have to be unique over all instances of object type.

### Object AGEDATE

The AGEDATE is the date used to calculate the age of an athlete.

Object/Attribute	Type	Remarks
type	e r	The type describes, how the age is calculated. The following values are acceptable: <ul style="list-style-type: none"> <li>* YEAR: The age is calculated using the year of the meet and the year of birth only.</li> <li>* DATE: The age is calculated exactly between the date and the birth date.</li> <li>* POR: Age calculation according the Portuguese federation.</li> <li>* CAN.FNQ: Calculation according the Quebec federation.</li> <li>* LUX: Calculation according the Luxembourg federation.</li> </ul>
value	d r	The date value.

### Object AGEGROUP

This object contains information about an age range. It is used in events and record lists.

Object/Attribute	Type	Remarks
agegroupid	n r	Only for events, every AGEGROUP object needs an id, because the objects can be referenced from ENTRY and RESULT objects. The id has to be unique within an AGEGROUPS collection.
agemax	n r	The upper bound of the age range. -1 means no upper bound.
agemin	n r	The lower bound of the age range. -1 means no lower bound.
gender	e -	In mixed events, the gender can be specified in the AGEGROUP objects. Values can be male (M), female (F) or mixed (X). This can be useful to define events with gender set to all (A), but the ranking is separated. This attribute is not allowed in the context of a RECORDLIST or TIMESTANDARDLIST object.
name	s -	The name of the age group (e.g. "Juniors").

type	e	-	For relay events, the type gives information about how the age is calculated: * SINGLE: This is the default value. The age of each relay swimmer has to be in the given range. * TOTAL: The total age of all swimmers has to be in the given range.
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### Collection AGEGROUPS

This collection contains all age group definitions of one event.

Object/Attribute	Type	Remarks
AGEGROUP	o m	The definition of one age group.

### Object ATHLETE

This contains all information of a athlete including all entries and results in the context of a meet sub tree.

Object/Attribute	Type	Remarks
athleteid	n r	The id attribute should be unique over all athletes of a meet. It is required for ATHLETE objects in a meet sub tree.
birthdate	d r	The date of birth for the athlete. If only the year of birth is known, the date should be set to January 1 <sup>st</sup> of that year.
CLUB <sup>(1)</sup>	o -	The club or team for the athlete, when he swam the record.
ENTRIES <sup>(2)</sup>	o -	All entries of the athlete.
firstname	s r	The first name of the athlete.
gender	e r	Gender of the athlete. Values can be male (M) and female (F).
HANDICAP	o -	Information about the handicap classes of a swimmer.
lastname	s r	The last name of the athlete.
license <sup>(2)</sup>	s -	The registration number given by the national federation.
middlename	s -	The middle name of the athlete.
nameprefix	s -	An optional name prefix. For example for Peter van den Hoogenband, this could be "van den".
nation <sup>(2)</sup>	e -	See table "Nation Codes" for acceptable values.
passport	s -	The passport number of the athlete.
RESULTS <sup>(2)</sup>	o -	All results of the athlete.

<sup>(1)</sup> These elements/objects are allowed in a record list sub tree only.

<sup>(2)</sup> These elements/objects are allowed in a meet sub tree only.

### Collection ATHLETES

This collection contains all athletes of one club.

Object/Attribute	Type	Remarks
ATHLETE	o m	Data of one athlete.

## Object CLUB

In the meet sub tree, this object contains information about a club, including athletes and relays with their entries and/or results. In the record list sub tree, the object contains information about the club or nation of record holders.

Object/Attribute	Type	Remarks
ATHLETES <sup>(1)</sup>	o	- The athletes of this club.
code	s	- The official club code given by the national federation. Only official club codes should be used here!
CONTACT <sup>(1)</sup>	o	- Contact address for the specific meet.
name	s	r The full name of the club or the team.
nation	e	- See table "Nation Codes" for acceptable values.
OFFICIALS <sup>(1)</sup>	o	- The officials from this club.
region	s	- The code of the regional or local swimming committee. Only official codes should be used here!
RELAYS <sup>(1)</sup>	o	- The relay teams of this club.
shortname	s	- A short version of the club name. This string is limited to 20 characters.
type	e	- The following types of clubs are allowed: <ul style="list-style-type: none"> <li>* CLUB: This is the default value.</li> <li>* NATIONALTEAM: The club represents a national team of a federation. In this case, the code, region and nation attribute should be the same.</li> <li>* REGIONALTEAM: The club represents a regional team. In this case, the code and region attribute should be the same.</li> <li>* UNATTACHED: To be used for the CLUB entry, that contains data of athletes, where the club is unknown. In this case, the attribute name and the CONTACT object are not required.</li> </ul>

<sup>(1)</sup> These objects and elements are not used in CLUB objects, which appear in the record list sub tree.

## Collection CLUBS

This collection contains all clubs that take part of one meet.

Object/Attribute	Type	Remarks
CLUB	o	m The data of one club.

## Object CONSTRUCTOR

This object contains information about the software, which created the Lenex file and the contact information about the provider of that software.

Object/Attribute	Type	Remarks
CONTACT	o r	Contact information of the provider of the software, which created the Lenex file.
name	s r	Name of the application that created the Lenex file.
version	s r	The version number of the application that created the Lenex file.

## Object CONTACT

This object contains the contact address for a person or organisation.

Object/Attribute	Type	Remarks
city	s -	The city of the contact address.
country	s -	See table "Country codes" for acceptable values.
email	s r	The e-mail address of the contact. The attribute is required in the context of a CONSTRUCTOR object only.
fax	s -	The fax number of the contact.
internet	s -	The full URL of the website of the contact person or organisation. The http:// should be included in the string.
name	s r	The last name of the contact person or the name of the organisation.
mobile	s -	The mobile phone number of the contact person.
phone	s -	The phone number of the contact person or the organisation.
state	s -	The state, province or county of the contact address.
street	s -	The first additional line of the address.
street2	s -	The second additional line of the address.
zip	s -	The postal code of the address.

## Collection ENTRIES

This collection contains all entries of on athlete or a relay team.

Object/Attribute	Type	Remarks
ENTRY	o m	The data of one entry.

## Object ENTRY

This object contains the information for a single entry of an athlete or a relay to a specific round of a meet.

Object/Attribute	Type	Remarks
agegroupid	n -	This value contains a reference to the age group of the event.
entrytime	st -	The entry time in the swim time format.
eventid	n r	This value contains a reference to the event.
heat	n -	The heat number of the entry.
lane	n -	The lane number of the entry.
MEETINFO	o -	This object contains the information, where the entry time was achieved.
RELAYPOSITIONS	o -	Only for relay entries. This object contains references to the relay swimmers.
status	e -	This attribute is used for the entry status information. An empty status attribute means a regular entry. The following values are allowed: * EXH: exhibition swim. * WDR: athlete/relay was withdrawn.

The combination of the attributes eventid, heat and lane should be unique over all ENTRY objects of the same meet.



## Object EVENT

This object contains all information of an event. For events with finals, there has to be an EVENT object for each round.

Object/Attribute	Type	Remarks
AGEGROUPS	o -	The AGEGROUPS collection contains the descriptions for the age groups in this event. For Open/Senior events, AGEGROUPS is not needed.
daytime	t -	The daytime of the start of the event.
eventid	n r	Every event needs to have an id attribute, so that it can be referenced by ENTRY and RESULT objects. The id attribute has to be unique over all EVENT objects of all sessions of a meet.
FEE	o -	The entry fee for this event. If there are global fees per athlete, relay and/or meet, the FEE elements in the MEET object should be used.
gender	e -	The gender of the event. The default value is all (A). Other values allowed are male (M), female (F) and mixed (X).
maxentries	n -	The maximum number of entries per club in this event. To limit the number of entries per athlete or relay, use the maxentries attribute in the MEET object.
number	n r	The number of the event. The event numbers should be unique over all events of a meet. The EVENT objects of the different rounds for the same event may have the same event number.
order	n -	This value can be used to define the order of the events within a session if it is not by the event number and if there are no start times for the events.
preeventid	n -	This value is a reference to a previous event's id. (e.g. the prelims events for final events). The default value is -1 and means, that there was no previous event.
round	e -	The following values are allowed here: <ul style="list-style-type: none"> <li>* TIM: This is the default value. Used for an event with timed finals.</li> <li>* FHT: Fastest heats of an event with timed finals. Events with this value for round should always refer to the corresponding timed final event, which should be of the same distance, stroke and age groups. Events with round set to FHT only make sense for the schedule and ENTRY objects, but never to be used for RESULT's.</li> <li>* FIN: This is used for finals including A, B, C, ... finals.</li> <li>* SEM: for semi finals.</li> <li>* QUA: for quarterfinals.</li> <li>* PRE: for prelims.</li> <li>* SOP: Swim-Off after prelims.</li> <li>* SOS: Swim-Off after semi-finals.</li> <li>* SOQ: Swim-Off after quarterfinals.</li> </ul>
run	n -	Used if there is more than one swim-off necessary. Default value is 1.
SWIMSTYLE	o r	The SWIMSTYLE object contains information about distance and stroke of the event.

## Collection EVENTS

This collection contains all events of one session.

Object/Attribute	Type	Remarks
EVENT	o m	The data of one event.

## Object FEE

The fee is used in MEET and EVENT objects.

Object/Attribute	Type	Remarks
currency	e -	See table "Currency Codes" for acceptable values.
type	e r	Used for fees in MEET objects only. Acceptable values are: * CLUB: global fee to be paid per club for the meet. * ATHLETE: global fee to be paid per athlete. * RELAY: global fee to be paid per relay team.
value	c r	The value of the fee in the currency format.

## Object HANDICAP

The handicap is used for handicapped athletes.

Object/Attribute	Type	Remarks
breast	e r	The handicap class for breaststroke. Allowed values are: * 0 - 15 standard handicap classes. * GER.AB: swimmers with a minor disability * GER.GB: swimmers with a mental handicap
free	e r	The handicap class for freestyle, backstroke and fly. Allowed values are the same as for the breast attribute.
medley	e r	The handicap class for individual medley. Allowed values are the same as for the breast attribute.
exception	c -	Additional information about handicap.

## Object JUDGE

This object contains information to attach an official to a session with his role in the session.

Object/Attribute	Type	Remarks
officialid	n r	A reference to a OFFICIAL object.
role	e -	Indicates the role of a judge. The list is built according to the FINA descriptions. Acceptable values are: * OTH: other or unknown. This is the default value. * REF: The referees. * STA: The starters. * ANN: The announcers or speakers. * JOS: The judge of strokes. * CTIK: The chief timekeeper * TIK: The timekeepers * CFIN: The chief finish judge * FIN: The finish judges * CIOT: The chief inspectors of turns. * IOT: The inspectors of turns. * FSR: The false start rope personnel. * COC: The clerks of course. * CREC: The chief recorders. * REC: The recorders.

## Collection JUDGES

This collection contains all judges of one session.

Object/Attribute	Type	Remarks
JUDGE	o m	The data of one judge.

## Object LENEX

This is the root object of every Lenex file which identifies it as a XML file conforming to the Lenex data format.

Object/Attribute	Type	Remarks
CONSTRUCTOR	o r	This object contains information about the software which created the Lenex file.
MEETS	o -	Contains all the information of meets like athletes, relays, entries and results.
RECORDLISTS	o -	Contains different types of records (e.g. World records, Olympic records) including age group records.
TIMESTANDARDLISTS	o -	Contains different type of time standards and qualification times.
version	s r	The version number of the Lenex format.

## Object MEET

This object contains all information of one meet, including events, athletes, relays, entries and results.

Object/Attribute	Type	Remarks
AGEDATE	o -	The date to be used to calculate the age of athletes. The default value is the date of the first session and type by year of birth only.
altitude	n -	Height above sea level of the meet city.
city	s r	The name of the city where the meet was run.
CLUBS	o -	Collection of clubs of the meet.
CONTACT	o -	The contact address of the meet organizer.
course	e -	The size of the pool. Acceptable values are LCM, SCM, SCY, SCM16, SCM33 and OPEN for open water swimming. If the attribute is not available, all SESSION objects need to have a course attribute.
deadline	d -	The date for the entry deadline.
FEE	o m	Fees used for this meet. On this level, different global fees for clubs, athletes and relays are allowed. If there are fees that have to be paid per entry, the FEE object in the EVENT objects should be used.
maxentries	n -	The maximum number of entries per athlete or relay. To limit the number of entries per event and club, use the maxentries attribute in the EVENT object.
name	s r	The name of the meet. Normally the name should not contain a full date (maybe the year only) and/or a city or pool name.
nation	e r	The three letter code of the nation of the meet city.
number	s -	The sanction number for the meet by the federation.
organizer	s -	The organizer of the meet (e.g. the German Swimming Federation, if the European Championship was held in Berlin).
POINTTABLE	o -	Description of the point table used for scoring.
POOL	o -	Details about the pool where the meet took place.
promoter	s -	The organisation which promotes the meet (e.g. FINA for the World Championships).
QUALIFY	o -	Details about how qualification times for entries are defined.
SESSIONS	o r	Description of all events grouped by session.
state	s -	The code of the state of the meet city.
timing	e -	The type of timing for a meet. Acceptable values are: * AUTOMATIC: A full automatic timing system was used. * MANUAL3: Timing was done with three manual times per lane. * MANUAL1: Timing was done with one manual time per lane.
type	e -	The meet type. The following values are allowed: * The default value is empty. This applies for normal meets that are run according to the FINA rules. * MASTERS: Master records can only be swum at a meet, that is declared as a masters meet.

## Object MEETINFO

This object is used in entries and records for general information about a meet.

Object/Attribute	Type	Remarks
approved <sup>(2)</sup>	s -	Contains a code for the organisation, who approved the qualification time, e.g. FINA, LEN or a IOC nation code. If this field is empty, the qualification time was not approved.
city <sup>(1)</sup>	s r	The city name where the meet took place.
course <sup>(2)</sup>	e -	This attribute indicates the pool length, where the qualification time was achieved. Acceptable values are LCM, SCM, SCY, SCM16, SCM33 and OPEN.
date <sup>(1)</sup>	d r	The date of the swim of the record or qualification time achievement.
daytime	t -	The day time of the swim.
name	s -	The meet name.
nation <sup>(1)</sup>	e r	The nation of the city for the meet.
POOL	o -	The details about the pool.
qualificationtime <sup>(2)</sup>	st -	The qualification time, since this can be different to the entry time. If the value is missing, the entry time is the qualification time.
state	s -	The state of the city for the meet.

<sup>(1)</sup> These elements are required only in the context of a RECORD object.

<sup>(2)</sup> These elements are used in the context of a ENTRY object only.

## Collection MEETS

This collection allows you to put the results of more than one meet in the same Lenex file. However, our experience with Lenex during the last years shows that it is better to keep different meets in separate files.

Object/Attribute	Type	Remarks
MEET	o m	Data of one meet.

## Object OFFICIAL

This object contains all information about an official.

Object/Attribute	Type	Remarks
firstname	s r	The first name if the official.
gender	e r	Gender of the official. Values can be male (M) and female (F).
lastname	s r	The last name of the official.
middlename	s -	The middle name of the official.
nameprefix	s -	An optional name prefix. For example for Peter van den Hoogenband, this could be "van den".
nation	e -	See table "Nation Codes" for acceptable values.
officialid	n r	The id attribute should be unique over all officials of a meet. It is required for JUDGE objects in a meet sub tree.
passport	s -	The passport number of the official.

## Collection OFFICIALS

This collection contains all officials of a club.

Object/Attribute	Type	Remarks
OFFICIAL	o m	The data of one official.

## Object POINTTABLE

This object is used to describe the point scoring used for a meet.

Object/Attribute	Type	Remarks
name	s r	The name of the point score system.
version	s r	The version number/year of the point score system.

## Object POOL

This object is used to describe the pool where the meet took place.

Object/Attribute	Type	Remarks
name	s -	The name of the venue (e.g. "Aquatic Center").
lanemax	n -	Number of the last lane used in the pool for the meet. The number of lanes can be calculated with LANEMAX - LANEMIN + 1.
lanemin	n -	Number of the first lane used in the pool for the meet.
temperature	n -	The water temperature.
type	e -	The type of the pool. Acceptable values are INDOOR, OUTDOOR, LAKE and OCEAN.

## Object QUALIFY

This object contains information about details, how qualification entrytimes are defined.

Object/Attribute	Type	Remarks
from	d r	The first day of the qualification period for entry times.
until	d r	The last day of the qualification period for entry times.
conversion	e	The way, how times are converted between LCM and SCM. * NONE: This is the default value. Only qualification times realized at meet of the same pool size are allowed. * FINA_POINTS: Qualification times, realized in a pool of another size are converted by calculating the FINA points and from there calculating back a time. * LCM_AS_SCM: For short course meets, qualification times realized at a long course meet are used, if faster than the best short course time.
relaymode	e	The way, how relay qualification entry times are calculated. * NONE: This is the default value. Relay entries are not checked at all. * CLUB: Like for individual results, the best time of the club realized in the qualification period is used. * INDIVIDUAL: The relay qualification time is calculated based on qualification times for the individual swimmers.

## Object RECORD

This object describes one individual or relay record. It is possible to have no ATHLETE / RELAY objects. In this case the record is a "record standard time".

Object/Attribute	Type	Remarks
ATHLETE	o -	The person who holds the record. This is only used for individual records.
comment	s -	This value can be used for additional comments like "Swum in the prelims" or things like that.
MEETINFO	o -	Information about the meet, where the record was swum.
RELAY	o -	The relay team and swimmers, who holds the record. This is only used for relay records.
SPLITS	o -	The split times of the record.
SWIMSTYLE	o r	The swimstyle contains information like distance, stroke of the record.
swimtime	st r	The final time of the record in the swim time format.
status	s	Can be used to add comment about the record, e.g. "Ratification pending by FINA"

## Object RECORDLIST

This object describes one single record list.

Object/Attribute	Type	Remarks
AGEGROUP	o	For agegroup records.
course	e r	The course for the record list. Acceptable values are LCM, SCM, SCY, SCM16, SCM33 and OPEN.
gender	e r	The gender for records in this list. Acceptable values are male (M), female (F) and mixed (X).
handicap	e -	The handicap class for the record list. Allowed values are: * 1 - 15 standard handicap classes.
name	s r	The name of the record list (e.g. "World Records").
RECORDS	o r	The records of this record list.
updated	d -	The date of the last change to the record list.
type	e -	The record type. The following values are allowed: * WR: World records. * OR: Olympic records. * ER: European records. * PAR: Pan American records. * AFR: African records. * AR: Asian records. * OCR: Oceanian records. * CWR: Commonwealth records. * FINA three letter nation code: The national records of the specific federation.

This list of types maybe extended by federations. In this case, values should have the nation code and a dot as prefix (e.g. **SUI.RZW** for records of a region in Switzerland).

## Collection RECORDLISTS

This collection contains a set of record lists. For each different combination of gender, course, age group or type, a separate RECORDLIST object is needed.

Object/Attribute	Type	Remarks
RECORDLIST	o m	Data of one record list.

## Collection RECORDS

This collection contains all records of a record list. If there is more than one athlete holding the same record, each of them has a RECORD object in the collection.

Object/Attribute	Type	Remarks
RECORD	o m	Data of one individual or relay record.



## Object RELAY

This object is used to describe one relay team for a record or for a meet.

Object/Attribute	Type	Remarks
agemax <sup>(2)</sup>	n r	The maximum age allowed for the oldest swimmer in the team. The value -1 means no upper bound.
agemin <sup>(2)</sup>	n r	The minimal age allowed for the youngest swimmer in the team. The value -1 means no lower bound.
agetotalmax <sup>(2)</sup>	n r	The maximum total age of all swimmers in the relay team. The value -1 means that the total age is unknown.
agetotalmin <sup>(2)</sup>	n r	The minimum total age of all swimmers in the relay team. The value -1 means that the total age is unknown.
CLUB <sup>(1)</sup>	o -	The club or team of the relay in the context of a record.
ENTRIES <sup>(2)</sup>	o -	All entries of the relay team.
gender <sup>(2)</sup>	e r	The gender of the relay team. Acceptable values are male (M), female (F) or mixed (X).
name	s -	The name of the relay team.
number <sup>(2)</sup>	n r	The team number of the relay team.
RELAYPOSITIONS <sup>(1)</sup>	o -	The relay swimmers in the context of a relay record.
RESULTS <sup>(2)</sup>	o -	All results of the relay team.

<sup>(1)</sup> These objects are allowed in the context of a record only.

<sup>(2)</sup> These elements/objects are allowed in the context of a meet only.

## Object RELAYPOSITION

This object is used for information about one relay swimmer.

Object/Attribute	Type	Remarks
ATHLETE	o -	Last name, first name, etc. of the athlete. This object is allowed in the context of a record only and in this case it is required.
athleteid	n -	A reference to the ATHLETE object of the athlete. This attribute is allowed in the context of a meet sub tree only.
number	n r	The number of the swimmer in the relay. The first swimmer is 1, the second 2 and so on. -1 can be used to add reserve swimmers.
reactiontime	rt -	The reaction time at the start of the first swimmer and the relay take over times for other swimmers.
status	e -	No status attribute means the swimmer finished his part correctly. Otherwise, the following values are allowed: * DSQ: relay athlete was disqualified. * DNF: relay athlete did not finish.

## Collection RELAYPOSITIONS

This collection contains information's about relay swimmers.

Object/Attribute	Type	Remarks
RELAYPOSITION	o m	Data of one relay swimmer.

## Collection RELAYS

This collection contains all relays of one club of a meet.

Object/Attribute	Type	Remarks
RELAY	o m	Data of one relay team.

## Object RESULT

This object is used to describe one result of a swimmer or relay team.

Object/Attribute	Type	Remarks
agegroupid	n -	Reference to an age group (AGEGROUP object in the AGEGROUPS collection of the EVENT object).
comment	s -	Additional comment e.g. for new records or reasons for disqualifications.
eventid	n r	Reference to the EVENT object using the id attribute.
points	n -	The number of points for the result according to the scoring table used in a meet.
place	n r	The final position in the result list for the current event/round. The value -1 can be used for results that are not in the result list (e.g. exhibition swims).
reactiontime	rt -	The reaction time at the start. For relay events it is the reaction time of the first swimmer.
RELAYPOSITIONS	o -	The information about relay swimmers in this result. Only allowed for relay RESULT objects.
status	e -	This attribute is used for the result status information. An empty status attribute means a regular result. The following values are allowed: * EXH: exhibition swim. * DSQ: athlete/relay disqualified. * DNS: athlete/relay did not start. * DNF: athlete/relay did not finish. * WDR: athlete/relay was withdrawn.
SPLITS	o -	The split times for the result. In a Lenex file, split times are always saved continuously.
swimtime	st r	The final time of the result in the swim time format.

## Collection RESULTS

This collection contains all results of a athlete or relay team of a meet.

Object/Attribute	Type	Remarks
RESULT	o m	Data of one single result.

## Object SESSION

This object is used to describe one session of a meet.

Object/Attribute	Type	Remarks
course	e -	With indicating a pool length per session, the global value of the meet can be overridden, e.g. if the prelim sessions are short course and the finals are long course. Acceptable values are LCM, SCM, SCY, SCM16, SCM33 and OPEN.
date	d r	The date of the session.
daytime	t -	The daytime when the session starts.
EVENTS	o r	The events of the session.
JUDGES	o -	The judges of the session.
name	s	Additional name for the session e.g. "Day 1 - Prelims".
number	n r	The number of the session. Session numbers in a meet have to be unique.
POOL	o -	The details about the pool, if they are different per session. Otherwise use the object in MEET.

## Collection SESSIONS

Depending on the context this collection contains all sessions of a meet or all sessions for a judge, where he is planned in.

Object/Attribute	Type	Remarks
SESSION	o m	Data of one session.

## Object SPLIT

This object contains information about a single split time. In a Lenex file, split times are always saved continuously.

Object/Attribute	Type	Remarks
distance	n r	The distance where the split time was measured.
swimtime	st r	The time of the result in the swim time format.

## Collection SPLITS

This collection contains all available split times for a single result.

Object/Attribute	Type	Remarks
SPLIT	o m	Data of one split time.

## Object SWIMSTYLE

This object is used to describe one swim style.

Object/Attribute	Type	Remarks
distance	n r	The distance for the event. For relay events it is the distance for one single athlete.
name	s -	The full descriptive name of the EVENT if the stroke is unknown (e.g. "5 x 75m Backstroke Kick").
relaycount	n r	The number of swimmers per entry / result. Value 1 means, that it is an individual event. All other values mean, that it is a relay event.
stroke	e r	The following values are allowed here: * BACK: for backstroke. * BREAST: for breaststroke. * FLY: for fly or butterfly. * FREE: for freestyle. * MEDLEY: for individual and relay medley. The order of stroke is according to FINA rules: Fly, back, breast, free for individual events. Back, breast, fly, free for relay events. * UNKNOWN: for all special events. In this case, the name attribute of the event is mandatory.
swimstyleid	n -	The id attribute is important for SWIMSTYLE objects, where the stroke attribute is "UNKNOWN". In this case, the id should be a unique value to help to identify the swim style.
technique	e -	The technique of the style. If this attribute is missing or empty, it means normal swimming. All other values are mainly used for technical events in meets for kids. The following values are allowed: * KICK: for kick only. * START: for start only. * TURN: for turn only.

## Object TIMESTANDARD

This object describes one time standard.

Object/Attribute	Type	Remarks
SWIMSTYLE	o r	The style contains information like distance, stroke of the record.
swimtime	st r	The time standard or qualification time.

## Collection TIMESTANDARDS

This collection contains a set of time standards.

Object/Attribute	Type	Remarks
TIMESTANDARD	o m	Data of one time standard (time and swim style).

## Object TIMESTANDARDLIST

This object describes one single time standard list.

Object/Attribute	Type	Remarks
AGEGROUP	o	- For age group time standards.
course	e	r The course for the record list. Acceptable values are LCM, SCM, SCY, SCM16, SCM33 and OPEN.
gender	e	r The gender for time standards in this list. Acceptable values are male (M), female (F) and mixed (X).
name	s	r The name of the time standard list (e.g. "Olympic A Time Standards").
qualifyfrom	d	- An optional date indicating the start of the qualification period.
qualifyuntil	d	- An optional date indicating the end of the qualification period.
TIMESTANDARDS	o	r The time standards or qualification times of this list.
type	e	- There can be different type of time standards. Default value is MAXIMUM. The following values are allowed: <ul style="list-style-type: none"> <li>* DEFAULT: The time standards describe a set of default times, that may be used in a team competition, where a result for an event of a team is missing or invalid and therefore is replaced by this default time.</li> <li>* MAXIMUM: The time standards describe a maximal time for a meet. Swimmers can only compete, when they are faster than the time standards.</li> <li>* MINIMUM: The time standards describe a minimal time for a meet. Swimmers can only compete, when they are slower than the time standards.</li> </ul>

## Collection TIMESTANDARDLISTS

This collection contains a set of time standard lists. For each different combination of gender, course, age group or type, a separate TIMESTANDARDLIST object is needed.

Object/Attribute	Type	Remarks
TIMESTANDARDLIST	o	m Data of one time standard list.

## 5. Lenex data types

In a Lenex file, the following data types are used:

String	s	A string containing any character. Special characters like < > " ' and & have to be quoted with &lt; &gt; &quot; &apos; and &amp;.
Number	n	A signed 32-bit integer number. Only the characters "0" .. "9" and "-" are allowed.
Enumeration	e	An enumeration is a set of predefined values that are allowed in the attribute of that data type.
Date	d	Dates are always represented by a string in the form "YYYY-MM-DD". Example: "2004-03-09" means <b>March 9, 2004</b>
Daytime	t	A daytime (hour and minutes) represented by a string in the form "HH:MM". Hours should be from 0 to 24, minutes from 0 to 59.
Currency	c	An integer number. Currency values are represented in cents, e.g. one dollar in the Lenex currency format is 100.
Swim time	st	The swim time data type is always a fixed length string of the following form: "HH:MM:SS.ss". <b>HH</b> : hours from 0 to 99, <b>MM</b> : minutes from 0 to 59, <b>SS</b> : seconds from 0 to 59, <b>ss</b> : Hundreds of a second from 0 to 99. Example: "00:14:45.86" means a time of <b>14:45.86</b> . In addition the string "NT" is allowed if no time is available.
Reaction time	rt	All reaction times are numbers and are measured in hundreds of a second. The first character indicates, if the reaction time is positive (+) or negative (-). Example "+14" means a positive reaction time of 14 hundreds. The reaction time "0.00" should be transmitted as "0". If the reactiontime is missing, the value should be empty.

### 5.1 Nation codes

For the nation codes, the three letter codes of FINA are used. The current table with all codes and nation names can be downloaded from [http://www.swimrankings.net/files/Lenex\\_Nation.txt](http://www.swimrankings.net/files/Lenex_Nation.txt)

### 5.2. Country codes

For the country codes, the international two letter postal codes are used. The current table with all codes and country names can be downloaded from [http://www.swimrankings.net/files/Lenex\\_Country.txt](http://www.swimrankings.net/files/Lenex_Country.txt)

### 5.3. Currency codes

For the currency codes, the international three letter codes are used. The current table with all codes and currency names can be downloaded from [http://www.swimrankings.net/files/Lenex\\_Currency.txt](http://www.swimrankings.net/files/Lenex_Currency.txt)

## 6. Specific extensions for different federations

### 6.1 Germany (GER)

For the round attribute in EVENT there is an additional value: "**GER.RES**". This means "Nachschwimmen" or re-swim and is used for the German team championships.

### 6.2 Switzerland (SUI)

The TEAMS collection is used for the Swiss Team Championship. It is allowed in the CLUB objects of a meet sub tree. The attribute "type" in the MEET object can have additional values ("**SUI.OPEN**", "**SUI.JUNIOR**").

```
TEAMS
  TEAM
    ENTRIES
      ENTRY
```

This description is not 100% complete and may be adapted to be used for other federations too.

## 7. Frequently asked questions (FAQ)

? Is it not possible to have HEAT and LANE in the RESULT object?

*There may be ENTRIES and RESULTS for the same event in the same file. That way, result and entry information can be made available for a certain entry/result.*

? What should I put in the required attributes for an ATHLETE in a RECORD when there is no record but a required time only?

*The ATHLETE / RELAY element is not required in a RECORD. None of both elements should be there in such a case.*



## 8. Version History

- 9. Dez 2005    HANDICAP in ATHLETE added, handicap in RECORDLIST added.
- 9. Dez 2005    QUALIFY in MEET added
- 21. Feb 2005    CLUB.shortname added  
ENTRY.status added
- 8. Feb 2005    Renamed id attributes to element name with "id" as suffix
- 27. Jan 2005    In an attribute of type number, the character "-" is allowed too.
- 21. Jan 2005    MEET.number added
- 31. Dec 2004    FAQ changed
- 30. Dec 2004    &apos; added as character that needs to be quoted
- 12. Dec 2004    CLUB.CONTACT changed to optional.
- 23. Nov 2004    ATHLETE, OFFICIAL: attribute nameprefix added.  
CONTACT: attribute firstname removed, since this is an address just name is good enough.  
CLUB.lsc: renamed to region to avoid another abbreviation.
- 19. Nov 2004    Lenex datatypes: Added separators according to W3C recommendations  
TIMESTANDARDLIST: attributes qualifyfrom, qualifyuntil and type added  
MEET.nation: Changed to required
- 9. Nov 2004    FEE.value: Changed to required
- 5. Nov 2004    CLUB: typo corrected, JUDGES removed
- 29. Oct 2004    EVENT.round: Renamed FI4 to QUA SO4 to SOQ.  
Attribute turn in EVENT added  
duplicate lastname in OFFICIAL removed.
- 12. Oct 2004    first public draft release of Lenex version 2.0

## X. Summary of changes from Lenex version 1.03

The following list maybe not be 100% complete. The new and recommended version to be used from 2005 is Lenex 2.0.

- \* Renamed elements: COMPETITION -> MEET, PERIOD -> SESSION, STR -> STROKE, DIS -> DISTANCE, NUM -> NUMBER, DISCNT -> RELAYCOUNT, TI -> TIMING, FNAME -> FIRSTNAME, PERSON -> ATHLETE, PID -> ATHLETEID, PEID -> PREVEVENTID, EID -> EVENTID, CID -> AGEGRUOUPID, RT -> REACTIONTIME, SEX -> GENDER, CAT -> AGEGROUP, CATS -> AGEGRUUPS.
- \* PLACE has been renamed to CITY; RANK is renamed to PLACE.
- \* PL/PM are replaced by COURSE.
- \* JUDGES is allowed in CLUB only. To handle judges who are not attached to a club, a special club object with type="UNATTACHED" is allowed.
- \* AGEDATE added to MEET.
- \* New object STYLE in EVENT, replaces STR, DISCNT, DIS, NAME
- \* In the object AGEGROUP the age instead of the YOB is stored. New elements AGEMIN, AGEMAX instead of MIN, MAX.
- \* New attribute "type" in object CLUB.
- \* New element COUNTRY for the two-letter country code in CONTACT.
- \* CODE in RESULT renamed to STATUS
- \* New object MEETINFO in ENTRY.
- \* Element TYPE in EVENT renamed to ROUND.
- \* New elements MAXENTRIES, ORDER in EVENT.
- \* Element TYPE in JUDGE renamed to ROLE.
- \* Collection SESSIONS added in JUDGE.
- \* Collection RECORDLISTS added in object LENEX.
- \* New element MAXENTRIES in MEET.
- \* NAME in ATHLETE renamed to LASTNAME.
- \* BIRTHDATE mandatory in ATHLETE, YOB removed.
- \* Element NUM in POSITION renamed to NUMBER.
- \* SPLITS removed from POSITION.
- \* CAT in RELAY replaced by AGEMIN / AGEMAX, new elements AGETOTALMAX / AGETOTALMIN.
- \* Element PLACE changed in RESULT; results which are not in the result list have to be marked with the element STATUS.
- \* Changes format of date, time, swim time and reaction time.