# Dictionary and field mapping in the Tick42 RMDS Bridge

Rev 01

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## 1  Overview

This document describes the options for configuring the Tick42 RMDS bridge to provide Mama API clients with a MAMA field dictionary. The MAMA API offers two ways for a client to obtain a dictionary, one is to load it from a local file independently of the Mama Bridge used, and the other is to subscribe to a dictionary from the bridge.

As well as providing the MAMA dictionary the bridge has to relate its content to the RMDS field dictionary which describes the data delivered over the RMDS. This is the field mapping process.  The RMDS dictionary can be obtained either locally from a file or by subscription over the RMDS.

Although Tick42 have implemented a comprehensive ability to map TR field names and types to MAMA field names and types, a very common use case requires that data messages carry fields with their original TR field names. With this in mind, the code and the related properties that control the configuration have been restructured so that this is default behaviour and no configuration data in the mama.properties file is required to achieve it. We believe that in many cases this will result in significantly simpler configuration and deployment. Details of all the settings are in an appendix should you need to override any of the defaults.
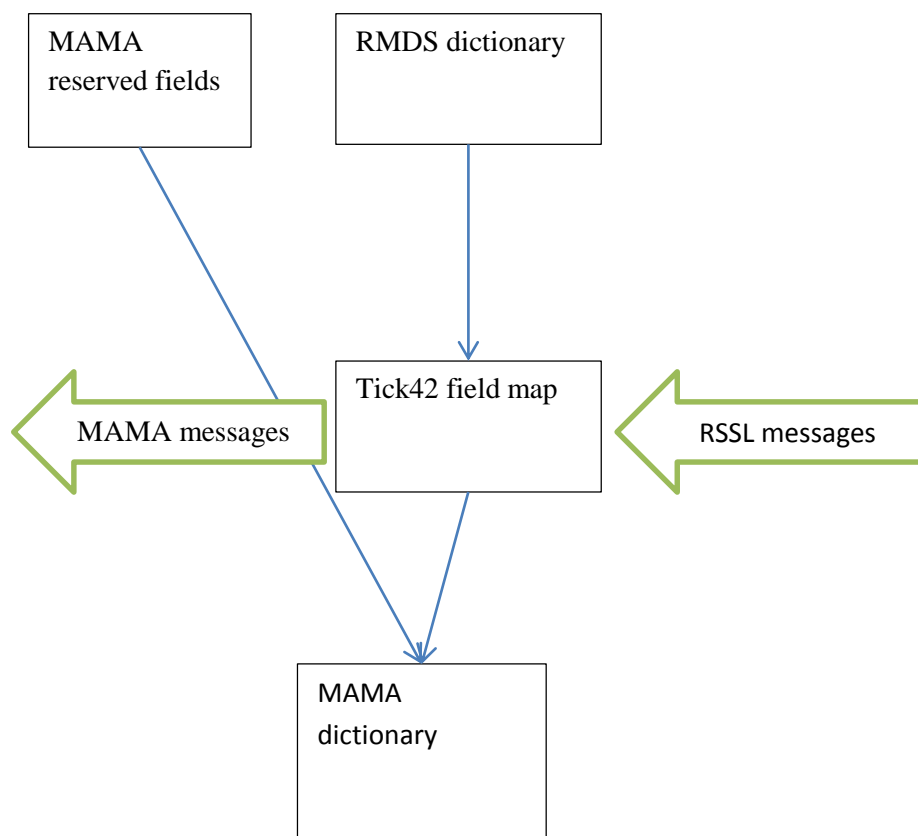
There are actually 2 parts to this ….

(i)     Translating the TR fields decoded from the rssl message into mama fields that are encoded into the mama message

(ii)     Building the mama dictionary that the client code subscribes to. This will contain all the field names, types and fids that will subsequently by fields in messages. The mama dictionary is built from field names defined in the field map and a set of reserved and other mama field names.

## 1.1 Default behaviour

This is the "No Configuration Required" case

(i)     The fields will be translated with no name change, i.e. they will appear in mama messages with TR field names

(ii)    The mama dictionary delivered by the bridge will contain a set of reserved mama fields plus all the TR fields

(iii)   The mama reserved fields are  simply those defined in the bridge and the RMDS dictionary is (by default) subscribed from the RMDS

```
┌──────────────┐     ┌──────────────────┐
│ MAMA         │     │ RMDS dictionary  │
│ reserved     │     │                  │
│ fields       │     │                  │
└──────────────┘     └──────────────────┘
        │                     │
        │                     ▼
        │            ┌──────────────────┐
   ◄────┤  MAMA      │ Tick42 field map │   ◄──── RSSL messages
        │  messages  │                  │
        │            └──────────────────┘
        │                     │
        ▼                     ▼
        ┌──────────────────┐
        │ MAMA             │
        │ dictionary       │
        └──────────────────┘
```

# 2 Translating fields – the field map

By field mapping we mean *whenever an incoming TR message contains field N of type T, insert it into the outgoing MAMA message with name N' and type T'*

## 2.1 The field map file

The file specified by the property  fieldmap in the mama.properties file is a csv file defined by Tick42 that contains columns representing the TR fid, the TR field name, the mama field name, the mama fid, the mama type and a description,

For example

,3,"DSPLY_NAME","wSymbol",470,"MAMA_FIELD_TYPE_STRING","symbol name"

This means that whenever we see the field DSPLAY_NAME (fid 3) in an RSSL message we insert the value into the MAMA message with the name "wSymbol", the fid 470 as type MAMA_FIELD_TYPE_STRING

We can add as many field mappings as we like using this file. It is used when we want to convert from TR field names to MAMA field names

## 2.2 Default mapping

If the property has no value, then the mappings are generated automatically from the TR dictionary, The mapping use the TR field name, a calculated fid and a type that is the best match.

Using the same example the mapping would be as if the fieldmap file had contained a line

,3,"DSPLY_NAME","DSPLY_NAME",10000,"MAMA_FIELD_TYPE_STRING",""

**This provides the useful default case where MAMA messages contain RMDS field names.**

## 2.3 Combined mapping

If a fieldmap file is specified and the  property unmapdfld is set to true (its default) then the field map is built from the contents of the file and the contents of the TR dictionary as above. In this case any field specification that is in the file takes priority over field specifications generated automatically from the TR dictionary

MAMA
reserved fields

RMDS dictionary

Field Map file

Tick42 field map

MAMA messages

RSSL messages
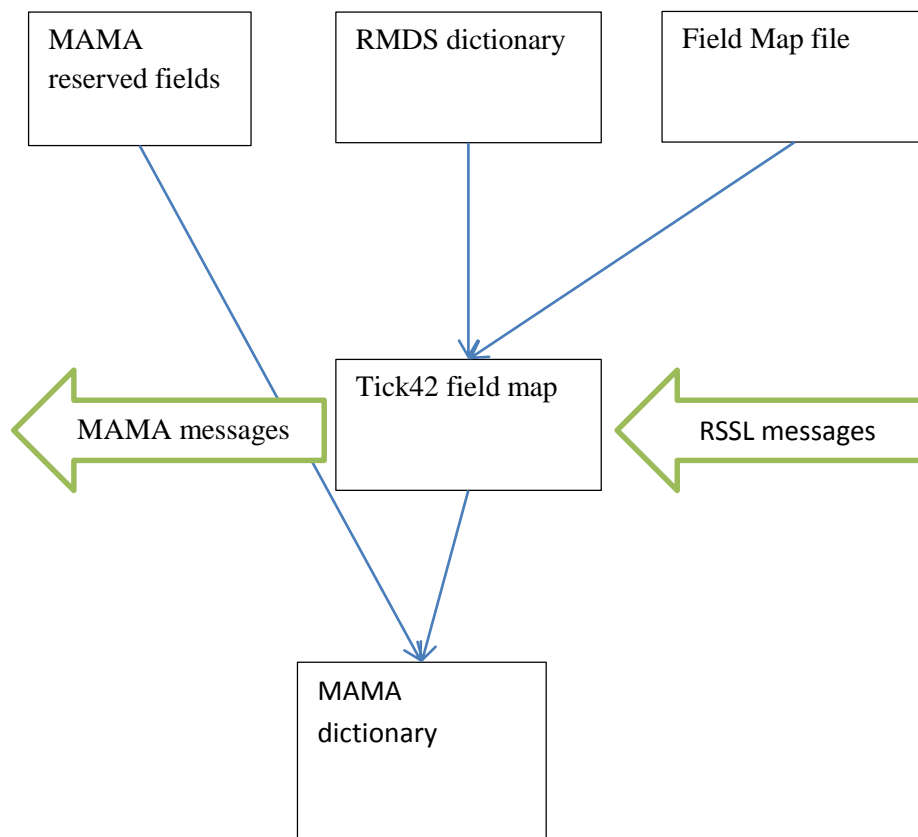
MAMA
dictionary

As the diagram shows, the field map, which is used to both create the mama dictionary and to translate messages is formed from both the field map file and the RMDS dictionary.

## 2.4   Overriding the mama reserved fields

Although the set of reserved fields built into the bridge is comprehensive and is unlikely to change, the mama_dict property allows the reserved fields to be read from a file

## 2.5   Fids

One problem that must be addressed in all of this is that TR fids are incompatible with MAMA fids. Firstly TR fids are signed and it is valid (and common) to have –ve values. By convention, custom

(user-defined) fields have –ve values. Secondly some TR fids have the same values as those of MAMA reserved fields.

We get round that by never using the TR fids. When TR fields are mapped to MAMA fields that are not already defined we allocate fids sequentially starting from some offset.

The offset is either specified by the property fidoffset or defaults to one higher than the maximum fid defined in the mama dictionary.

## 2.6 Publishing

The requirement is identical, other than the lookup for translation being in the reverse direction. The same default field map / field map file mechanism is applied.

# 3 Building the dictionary

Here we are discussing the mama dictionary. This is the dictionary that the client code will receive is if subscribes to a dictionary on a mama transport. The content is combined from 2 sources.

(i)      The mama reserved field set, which can optionally be read from a file

(ii)      The field map as described in the previous section

## 3.1 The optional  dictionary file
The file specified by mama_dict is a simple <fid>|<fieldname>|<typecode> text file. This is the file that can be rendered by some of the OpenMAMA tools or by the OpenMAMA API

For example

109|wAskPrice|25

## 3.2 No dictionary file specified

If the property has no value specified then a default set of fields including all the mama reserved fields and the mamda book fields is used.

***This provides the useful default case where MAMA messages contain RMDS field names.***

## 3.3 The mama dictionary

The MAMA fields and fids defined in the field map are added to the default MAMA fields or the MAMA fields from the file. This is used to build the MAMA dictionary object that the client subscribed to

# 4 TR dictionaries

This section describes the options for sourcing the TR dictionary. Where this dictionary is sourced from has no effect on either the field mapping or the subsequent MAMA dictionary.

## 4.1 Default subscription

By default the bridge subscribes to the dictionary by sending a message to the ADS. This is part of the normal connection protocol. The field dictionary and the enum file will both be sent in a message from the ADS.

***This provides the useful default case where MAMA messages contain RMDS field names.***

## 4.2 Local files

Optionally, the dictionary and enum files can be loaded from the filesystem by specifying their path in the properties *fieldfile* and *enumfile* If these properties have valid values then the TR dictionaries will be read from the file and no subscription is made.

## 4.3 Enum processing

If a field is defined in the TR dictionary as type ENUMERATED it will be mapped (by default) to MAMA_FIELD_TYPE_STRING. When the field is decoded from the RSSL message the enumerated value is looked up and inserted into the message

# 5  Appendix

This is an extract from the bridge configuration that provides details of all the settings

## Data dictionary settings

The mama dictionary that is delivered when a mama client makes a dictionary subscription is built from a set of mama field definitions and the field mapping table that is used to convert fields in the rssl message into mama fields. The mapping process is described elsewhere in this document

| property | type | default value | description |
|---|---|---|---|
| **fieldfile** | string | none | Location for a file containing the RMDS data dictionary. If this setting is not specified, the transport will subscribe to the data dictionary from the RMDS. The file is usually named "RDMFieldDictionary" |
| **enumfile** | string | none | Location for a file containing the RMDS enum type definitions. If this setting is not specified, the transport will subscribe to the defintions from the RMDS. The file is usually named "enumtypes.def" |
| **fieldmap** | string | none | Location of the field mapping file. This file is used to map specific RMDS fields to mama fields. If no file is specified then fields are mapped from the RMDS dictionary according to the setting of the unmapfld property. |
| **mama_dict** | string | none | Location of a mama dictionary file. If no file is specified then a predefined set of mama fields are used. These are the "reserved" mama fields and the mamda book fields. |
| **unmapfld** | bool | true | Controls how unmapped fields are handled. If false then only those RMDS fields specified in the fieldmapping file are processed. If true then all RMDS fields are converted. Those that are not specified in the field mapping file are given a fid that is allocated sequentially starting from the value specified in the 'fidoffset' setting and a mama type that best corresponds to the TR field type. The TR field names are used |
| **fidoffset** | int | 0 | Starting value for fids allocated for unmapped fields. If no value (or 0) is specified then fid allocation stars at the next available fid value. This will be the highest value found in the mama_dict file (or the predefined fields) and in the fieldmap file (if one is specified) |
| **dictsource** | string | "WOMBAT" | The source name used to publish the data dictionary. In most cases existing (and new applications) will follow the example in mamalistenc and subscribe on the default source. This option allows applications that expect a different name to run unchanged. |

**Examples**

```
# mama_dict - path for the mama dictionary file
mama.tick42rmds.transport.rmds_tport.mama_dict=mama_dict.txt
```

```
# fieldmap - the path for the csv fields map from RMDS to Wombat names.
mama.tick42rmds.transport.rmds_tport.fieldmap=$(APPDATA)\\Tick42\\RttXL\\fieldmap.c
sv
```

```
# fidsoffset - the value of the first synthesised FID of RMDS fields that are not
explicitly mapped.
mama.tick42rmds.transport.rmds_tport.fidsoffset=20000
```

```
# fieldfile - the path for the RMDS fields definitions file
mama.tick42rmds.transport.rmds_tport.fieldfile=RDMFieldDictionary
```

```
# enumtype - the path for the RMDS enumerations values and strings
mama.tick42rmds.transport.rmds_tport.enumfile=enumtype.def
```