

# MLT2 Port Excel File Format Documentation v1.0.1

## MLT2 Port Excel File Format Documentation v1.0.1

### Versioning and Compatibility

It is critical to include the correct version number in your Excel document. The version number (found in the MLT-015 field) determines how the file is interpreted, what requirements apply, and which instructions are relevant. We use **semantic versioning** for the version number:

- **Major** version changes indicate breaking changes to the format or requirements. Files with different major versions may not be compatible with the same code.
- **Minor** version may remove items from codelists, may limit values further, but remains the same for parsing.
- **Patch** version changes fix minor issues, such as documentation or instructions, and do not affect compatibility.

Any implementation must always reflect the correct version of the document so that the code reading the Excel file can reliably determine which version it receives and process it accordingly. Failure to provide the correct version may result in incorrect parsing or validation errors.

This document describes the required structure, formatting, and limitations for Excel files to be processed by the MLT2-service ( `MLT2SheetReaderService` ). It is intended for customers and integrators who need to generate compatible Excel files for marine traffic statistics import.

---

### Table of Contents

- [Versioning and Compatibility](#)
- [File Structure and Data Reading Logic](#)
  - [How Data Is Read](#)
  - [File Structure](#)
    - [General Requirements](#)
    - [Sheet Structure](#)
    - [Sections in the First Sheet](#)
  - [Required Fields by Section](#)
- [Sheet and Header Names](#)
- [Header Fields and Data Types](#)
- [Cargo Group and Unit Type Sheets](#)
- [Data Formatting Rules](#)

- [Limitations](#)
  - [Error Handling and Validation Messages](#)
  - [Human Fillable Excel Templates](#)
- 

## File Structure and Data Reading Logic

This structure allows for clear separation of metadata, port call details, and cargo data, and supports multiple port calls and cargo entries per file. It is designed to be both human-readable and machine-parseable.

### How Data Is Read

The code processes the Excel file as follows:

- It searches for cells containing MLT-xxx headers (e.g., `MLT-100` , `MLT-410` ).
- For each header, it reads the value two cells below the header. There may be an optional human-readable label between the header and its value, which is ignored by the system.
- For table-like data (cargo tables), the code reads the value two cells below the header for each column, then continues reading subsequent rows for additional cargo entries until an empty row or “Yhteensä”-string is found.
- Table rows that start with "Yhteensä" (case-insensitive) are skipped and not processed.
- The code continues reading rows until it encounters an empty row or a row that does not contain valid data.
- Additional port calls can be added below the previous ones, following the same structure. Each port call and its cargo tables are grouped together.

**One file can contain multiple port calls (1-n).** Each port call can have zero or more rows in both the inward and outward cargo tables. In other words, you can report several port calls in one file, and each port call can have any number of cargo entries (including none). The order and grouping of sections must be preserved for correct parsing.

### File Structure

The Excel file is structured into distinct sections, each serving a specific purpose:

#### General Requirements

- **File Type:** Only `.xlsx` (Excel) files are supported.
- **Encoding:** UTF-8 recommended.
- **Localization:** All data must be in Finnish. The main sheet can be named freely as it's detected using its index.

- **Sheet Order:** The main data sheet must be the first sheet (index 0).

#### Sheet Structure

- **First Sheet:** Contains the main port call and cargo data. Named **Satamaraportti**
- **Additional Sheets in the human fillable version:**
  - **Tavararyhmä** (Cargo Group sheet) is **hidden** in human fillable version as it's contents are not meant to be edited. This sheet is not needed in in the automatically generated version.
  - **Kuljetusyksikkötyyppi** (Unit Type sheet) is **hidden** in human fillable version as it's contents are not meant to be edited. This sheet is not needed in in the automatically generated version.

#### Sections in the First Sheet

##### 1. **Basic Information (Raportin perustiedot):**

- This section appears only once at the top of the file.
- Contains metadata about the document, its creator, and creation time.
- File type, always "Port" in **MLT-011** .
- File version number **MLT-015** , indicates what version of the file should be interpreted as.
- **MLT-010** Reporter is a freeform text explaining what organisation has written this document.
- **MLT-120** Reporting Port is the UN/LOCODE 5-character code for that harbour (e.g., **FIHEL** ).
- A third field for the reporting year and month is not required by the code, but is recommended for human verification.
- In human fillable version these fields have been split to multiple rows to reduce horizontal scrolling. The code supports having these fields in a single row too if it's more convenient to implement in the generated version.

##### 2. **Port Call (Satamakäynti):**

- Contains information about a single port call.
- There can be multiple port calls in one Excel file, one after another, each of them including their own inward and outward cargo tables before the next port call starts.
- In human fillable version these fields have been split to multiple rows to reduce horizontal scrolling. The code supports having these fields in a single row too if it's more convenient to implement in the generated version.
- Fields:
  - **MLT-100** Visit ID, is critical for matching to correct port call (max 35 chars, must be valid Visit ID).
  - **MLT-130** Arrival Date/Time "Saapumisaika (ATA)", in ISO 8601 format **yyyy-mm-dd hh:mm** .
  - **MLT-131** Departure Date/Time "Lähtöaika (ATD)", in ISO 8601 format **yyyy-mm-dd hh:mm** .
  - **MLT-113** Ship Name "Aluksen nimi" (max 35 chars).

- Ship identification fields, at least one of them filled:
  - **MLT-110** IMO Number "Aluksen IMO", 7 numbers as a string, last of them a valid checksum, may start with 0.
  - **MLT-111** MMSI Number "Aluksen MMSI", 9 numbers (that does not start with 0).
  - **MLT-112** Call Sign "Aluksen kutsutunnus", 4-12 characters.
  - **MLT-114** Other id "Muu alustunniste", max 25 characters, used especially for barges
- **MLT-180** Cruise passengers count "Risteilymatkustajien lkm.", optional field (you can enter 0 if ship is not counted as cruise ship).
- **MLT-181** Cruise excursion passengers count "Maissakävien risteilymatkustajien lkm.", optional field (you can enter 0 if ship is not counted as cruise ship).
- **MLT-191** Arriving in "Laiva saapuu", either: **kotimaan liikenteessä** or **ulkomaan liikenteessä** meaning "domestic traffic" or "foreign traffic".
- **MLT-192** Departing in "Laiva lähtee", either: **kotimaan liikenteessä** or **ulkomaan liikenteessä** meaning "domestic traffic" or "foreign traffic".

### 3. Inward Cargo Table (Saapuva lasti):

- Contains zero or more rows of inward cargo data for the port call.
- Fields:
  - **MLT-410** Cargo group "Tavararyhmä", one of the A-column strings from sheet **Tavararyhmä** in the human fillable excel (sheet is normally hidden there).
  - **MLT-420** Transit "Kauttakulku", either **Kyllä** (true) or **Ei** (false) for normal cargo, for empty containers use **Ei koske** (not applicable).
  - **MLT-430** Unit type "Kuljetusyksikkötyyppi", one of the A-column strings from sheet **Kuljetusyksikkötyyppi** in the human fillable excel (sheet is normally hidden there).
  - **MLT-440** Unit quantity "Lukumäärä", positive integer.
  - **MLT-450** Gross weight "Bruttopaino", positive integer, for empty containers use 0 (zero).

### 4. Outward Cargo Table (Lähtevä lasti):

- Contains zero or more rows of outward cargo data for the port call.
- Fields:
  - **MLT-510** Cargo group "Tavararyhmä", one of the A-column strings from sheet **Tavararyhmä** in the human fillable excel (sheet is normally hidden there).
  - **MLT-520** Transit "Kauttakulku", either **Kyllä** (true) or **Ei** (false) for normal cargo, for empty containers use **Ei koske** (not applicable).
  - **MLT-530** Unit type "Kuljetusyksikkötyyppi", one of the A-column strings from sheet **Kuljetusyksikkötyyppi** in the human fillable excel (sheet is normally hidden there).

- MLT-540 Unit quantity "Lukumäärä", positive integer.
- MLT-550 Gross weight "Bruttopaino", positive integer, for empty containers use 0 (zero).

#### Required Fields by Section

##### • **Basic Information:**

- MLT-011 Report Type, must be "Port".
- MLT-015 Report Version, must match the expected version.
- MLT-010 Reporter.
- MLT-120 Reporting Port.

##### • **Port Call:**

- MLT-100 Visit ID, unique identifier for the port call (must match existing port call).
- MLT-130 Arrival Date/Time.
- MLT-131 Departure Date/Time.
- MLT-113 Ship Name.
- At least one of:
  - MLT-110 IMO Number.
  - MLT-111 MMSI Number.
  - MLT-112 Call Sign.
  - MLT-114 Other id
- MLT-191 Arrives in
- MLT-192 Departs in

##### • **Cargo Tables:**

- When cargo rows are present, the following fields are required:
  - Inward:
    - MLT-410 Cargo Group.
    - MLT-420 Transito.
    - MLT-430 Unit Type.
    - MLT-440 Unit Quantity.
    - MLT-450 Gross Weight.
  - Outward:
    - MLT-510 Cargo Group.
    - MLT-520 Transito.
    - MLT-530 Unit Type.
    - MLT-540 Unit Quantity.

- MLT-550 Gross Weight.

If any of these are missing or blank, the file will be rejected with a validation error.

## Sheet and Header Names

- **Sheet Names:**

- Main data: any name (must be first sheet).

- **Header Names:**

- Must match the following list exactly (case-insensitive, trimmed):

Header, Label	Code	Description	Data Type
MLT-011 MLT2 raportoinnin tyyppi	REPORT_TYPE	Report type	String, must be "port"
MLT-015 MLT2 pohjan versionumero	REPORT_VERSION	Report version	String
MLT-010 Raportoija	REPORTER	Reporter name	String (max 35 char.)
MLT-120 Raportointisatama	REPORTING_PORT	Reporting port	String (UN/LOCODE 5 char.)
MLT-100 Visit ID	VISIT_ID	Unique visit ID	String (max 35 char.)
MLT-130 Saapumisaika (ATA)	DATE_TIME_OF_ARRIVAL	Arrival date/time	DateTime (ISO 8601)
MLT-131 Lähtöaika (ATD)	DATE_TIME_OF_DEPARTURE	Departure date/time	DateTime (ISO 8601)
MLT-113 Aluksen nimi	SHIP_NAME	Ship name	String (max 35 char.)
MLT-110 Aluksen IMO	IMO_NUMBER	IMO number	String (7 numbers, last is checksum)
MLT-111 Aluksen MMSI	MMSI_NUMBER	MMSI number	Number (9 numbers, no leading 0)
MLT-112 Aluksen kutsutunnus	CALL_SIGN	Call sign	String (4-12 char.)
MLT-114 Muu alustunniste	OTHER_IDENTIFIER	Other id	String (max 70 char.)

MLT-180 Risteilymatkustajien lkm.	ARRIVING_CRUISE_ PASSENGERS	Cruise passengers quantity	Integer
MLT-181 Maissakäyvien risteilymatkustajien lkm.	ARRIVING_CRUISE_ EXCURSION_PASSE NGERS	Cruise passengers excursion quantity	Integer
MLT-191 Laiva saapuu	ARRIVAL_INDICATO R	Arrival indicator	String (Either "kotimaan liikenteessä" or "ulkomaan liikenteessä")
MLT-192 Laiva lähtee	DEPARTURE_INDICA TOR	Departure indicator	String (Either "kotimaan liikenteessä" or "ulkomaan liikenteessä")
MLT-410 Tavararyhmä	INWARD_CARGO_GR ROUP_ID	Inward cargo group	String (One of "Tavararyhmä" sheet A-column values from human fillable version)
MLT-420 Kauttakulku	INWARD_TRANSITO	Inward cargo is transito	String ("Kyllä", "Ei" or "Ei käytössä")
MLT-430 Kuljetusyksikkötyyppi	INWARD_CARGO_UN IT_TYPE	Inward cargo unit type	String (One of "Kuljetusyksikkötyyppi" sheet A- column values from human fillable version)
MLT-440 Lukumäärä	INWARD_CARGO_UN IT_QUANTITY	Inward cargo unit quantity	Integer
MLT-450 Bruttopaino	INWARD_TOTAL_GR OSS_WEIGHT	Inward total gross weight	Integer
MLT-510 Tavararyhmä	OUTWARD_CARGO_ GROUP_ID	Outward cargo group	String (One of "Tavararyhmä" sheet (hidden) A-column values from human fillable version)
MLT-520 Kauttakulku	OUTWARD_TRANSIT O	Outward cargo is transito	String ("Kyllä", "Ei" or "Ei käytössä")

MLT-530 Kuljetusyksikkötyyppi	OUTWARD_CARGO_ UNIT_TYPE	Outward cargo unit type	String (One of "Kuljetusyksikkötyyppi" sheet (hidden) A-column values from human fillable version)
MLT-540 Lukumäärä	OUTWARD_CARGO_ UNIT_QUANTITY	Outward cargo unit quantity	Integer
MLT-550 Bruttopaino	OUTWARD_TOTAL_G ROSS_WEIGHT	Outward total gross weight	Integer

### Header Fields and Data Types

- **String fields:** Must be plain text, trimmed, and in Finnish where applicable.
- **DateTime fields:** Must be in ISO 8601 format (e.g., 2025-12-09T15:30:00+02:00).
- **Integer fields:** Must be whole numbers (no decimals).
- **Decimal fields:** Use a period ( . ) as the decimal separator.
- **Boolean fields:**
  - For "transito" and similar: use the string **Kyllä** (yes) for true, any other value for false.
  - For arrival/departure indicators: use the string **kotimaan liikenteessä** for domestic, the string **ulkomaan liikenteessä** for foreign.

### Data Formatting Rules

- **Maximum columns:** Only columns 0–30 are read; extra columns are ignored. This allows having section headers on a single row for that section.
- **Special rows:** Rows with **Yhteensä** in cargo group columns are ignored (case-insensitive).
- **Header matching:** Headers must match exactly as above; otherwise, columns are ignored.
- **Sheet order:** The main data sheet must be first sheet of the file, others are ignored.

### Limitations

- **File must be .xlsx**
- **Only columns 0–30 are read**
- **Cargo group and unit type sheets are mandatory**
- **Date/time fields must be ISO 8601**
- **Special rows (Yhteensä) are ignored in cargo lists (case-insensitive; e.g., "Yhteensä", "YHTEENSÄ", etc.)**
- **Maximum accepted excel file size is 10MB**

- **File will be scanned for viruses on upload**

## **Error Handling and Validation Messages**

If the file is invalid, the following errors may be returned:

- Missing required fields (see above).
- Invalid date/time format.
- Invalid or missing cargo group/unit type codes.
- Unknown or mismatched headers.
- At least one of IMO, MMSI, Call Sign, Other identifier is required.

Each error will specify the field and a message, e.g.:

- Reporting port is missing for visit ID: 12345
- Date and time of arrival is missing for visit ID: 12345
- At least one of IMO number, MMSI number, Call Sign, or Other Identifier is required for visit ID: 12345. All are null or blank.

## **Human Fillable Excel Templates**

As part of the MLT2 project, a human-fillable Excel template has been created to help customers and integrators generate valid Excel files. This template includes data validation, dropdowns for cargo groups and unit types, and instructions for filling out the required fields.

The data validation and dropdowns are not required for the MLT2-service to read the files, but they help ensure that the files are correctly formatted and reduce the likelihood of errors during processing.