DESCRIPTION OF THE CLISSA APPLICATION: CLIMATOLOGY MODULE FOR SEMI-AUTOMATIC AND AUTOMATIC SYSTEMS

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Summary
This software has been developed for the purpose of processing incoming data from the main climatological stations according to the current standards in force at the Spanish National Meteorology Institute (INM) and for the progressive replacement of traditional observation systems through automatic stations, in addition to providing support for climatological elements such as cloudiness, evaporation in Piche evaporimeter, etc., and weather phenomena (storm, dew, mist, dust clouds,...), not susceptible to automation as yet.

Key words: climatological elements, weather phenomena, data entry, valid files

1. INTRODUCTION

CLISSA carries out the climatological processing of data gathered by the automatic and semi-automatic systems that have been implanted in INM; specifically:
- It manages data entry, including validation processes established by the Data Bank Section of the Climatological Development Service of the Spanish National Meteorology Institute.
- It prepares different climatological forms:  
  - Ten-year climatological summaries
  - Monthly summaries
  - Tank evaporation form
  - Subsoil temperature form
  - Radiation forms (global, diffused and direct)
It encodes and transmits the monthly climatological reports
It prepares and transmits valid files to be directly included in the Climatological Data Bank of the Spanish National Meteorology Institute.

2. DATA ENTRY

Depending on the type of data entry and the processing these data need, the following distinctions can be made:

2.1. Main Automatic Climatological Data Entry:

Includes the data from the variables whose values can be obtained directly from the sensors such as temperature, humidity, precipitation, wind and pressure, which are displayed together on the same screen (Figure 2), and on which CLISSA carries out the following operations:

- Data validation
- Calculation of certain values (maximum intensities, time distributions, high and low values, etc.)
- Possibility of modifying data by the weather office staff

![Figure 2: Input data screen coming from sensors](image-url)
2.2. Main Manual Climatological Data Entry:

These are the variables that must be observed in the traditional way: clouds, weather phenomena, insolation, visibility and Piche evaporation, even though some stations have sensors that will allow some of these measurements to be taken automatically (visibility, insolation, weather phenomena); with these types of variables, CLISSA's tasks consists of:

- Data validation
- Activating or deactivating options, depending on the data obtained from the sensors. For example, the meteor cannot be marked rain if registered precipitation is zero, or the meteor cannot be marked frost if the minimum temperature close to the ground is above a fixed threshold.
- Possibility of importing data from the synops report issued by the station, either manually or automatically, taking into account what was stated in the previous point.

![Figure 3: Non-automatic data entry screen](image)

2.3. Data Entry from Other Variables:

CLISSA also supports evaporation at subsoil temperatures and (global, diffused and direct) radiation which either may be or may not be automated:

- Evaporimeter tank evaporation:
  - Still in process of being automated.
  - Manual data entry, which must be in accordance to the rest of the data for the day.
Subsoil temperatures:
- Not automated or partially automated.
- Manual or automatic data entry; in either case the data on the state of the terrain (characteristics and thickness) must be entered manually which must be in accordance with the rest of the data for the day. For example, frost cannot be specified if this is not the weather phenomenon indicated for that day.

Radiation (global, diffused, direct)
- Not automated or automated
- Manual or automatic data entry.
- Automatic input can be carried out from two different sources:
  - The sensors belonging to the observation system
• From the external DataLogger system.

3. CLIMATOLOGICAL SUMMARIES PREPARED USING CLISSA

Clissa prepares the climatological summaries currently in force at INM, specifically:

- Ten-year climatological summaries
- The Monthly Climatological Summary (including the preparation of the CLIMAT and MENSUAL reports)
- Other climatological summaries

3.1. Ten-year climatological summaries

CLISSA, according to what is stipulated in the ‘Standard for the completing of climatological data collection forms’ for the Spanish National Meteorology Institute prepares the ten-year climatological summaries currently in force at INM:

- Temperature and Humidity
- Precipitation and Meteors
- Wind
- Cloudiness, Insolation, Pressure and Visibility

Below are some examples for each of these forms:
### Figure 7: Ten-year form for temperature

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### Figure 8: Ten-year form for precipitation and meteors

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### Note

*Probable re reproduction total o parcial por cualquier medio, con autorización expresa por escrito del INM.*
Figure 9: Ten-year form for wind

Figure 10: Ten-year form for cloudiness, insolation, pressure and visibility
3.2. The Monthly Climatological Summary

The Monthly Climatological Summary, shown in Figure 11, includes the elaboration of the CLIMAT reports for diffusion both nationally and internationally, and the MENSUAL report for diffusion which is exclusively national. Figure 12 shows the corresponding CLISSA screen for both reports.

Figure 11: Monthly climatological summary

Figure 12: CLIMAT and MENSUAL reports
3.3. Other climatological summaries

CLISSA also permits preparation of summaries corresponding to:
- Evaporimeter tank evaporation
- Subsoil temperatures
- Radiation:
  - Global
  - Diffused
  - Direct

4. CLIMATOLOGICAL FILES

CLISSA prepares and transmits valid files to be directly included the Climatological Data Bank of the Spanish National Meteorology Institute.

Figure 13: Climatological file creation

Figure 13 shows the screen that permits the period to be selected and the variables the files are going to receive; once created, CLISSA makes their transmission possible through the screen shown in Figure 14.
APPRECIATION

The staff of the Climatological Development Service of the Spanish National Meteorology Institute.

REFERENCES
Validation processes: Data Bank Section of the Climatological Development Service of the General Deputy Office for Special Climatological Research Programmes of the Spanish National Meteorology Institute.