

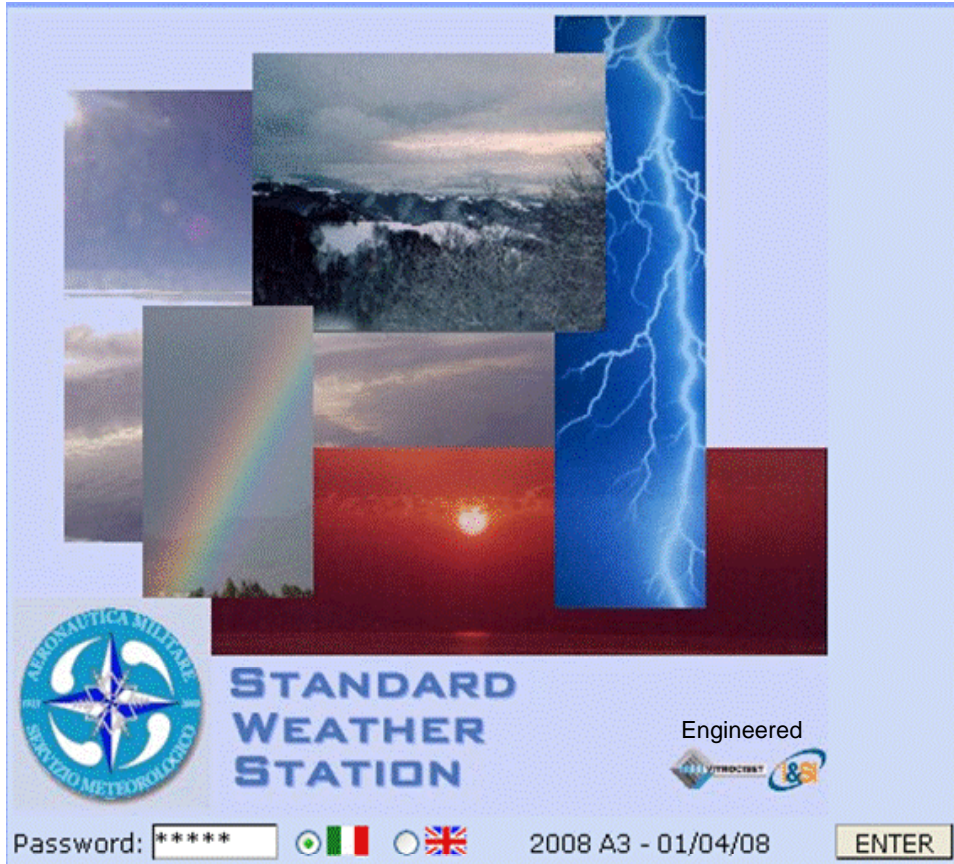


Italian National Meteorological Service

The new Standard Weather Station (SWS)



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A prototype of a new Standard Weather Station (SWS) has been developed in order to modernize and improve the ground observation network of the Italian National Meteorological Service. Based on the EUMETNET AWS Programme requirements, the station is able to operate both in manual and fully automatic way.

The main features of the new SWS are the following: possibility to interface every digital sensor in a simple way by means of user friendly configuration tables; automatic database generation including observed and derived variables; production of meteorological messages both in TAC and BUFR format as required by the WMO MTDCF (Migration to Table Driven Code Forms); transmission of the collected data to the Central archive; possibility of local and remote control.

This system is a complete and flexible solution for a modern ground observation network management. It is going to be the standard for the Italian national meteorological network and the sw is available to NMSs.

SWS to distinguish meteorological know-how (sw processing) from hw technology (sensors, computer, etc)

GENERAL REQUIREMENTS

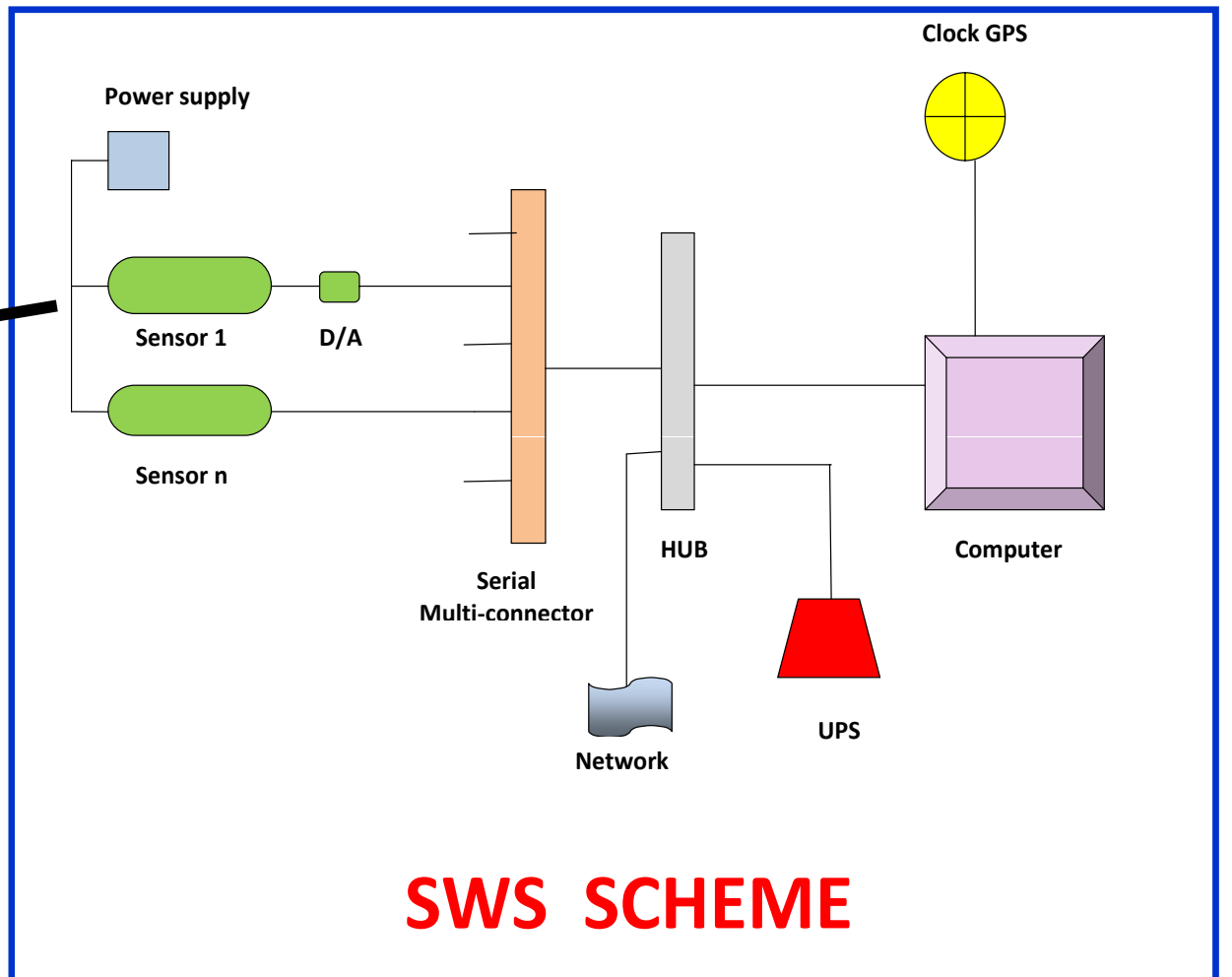
- to gather high frequency physical atmospheric parameters from meteorological sensors
- to generate appropriate databases of observed and derived variables
- to process and transmit data and meteorological messages
- to operate both in manual and fully automatic mode
- to meet WMO, ICAO and EUMETNET standards

SYSTEM REQUIREMENTS

- Simplicity
- Modularity
- Scalability and expandibility
- Software portability
- Software flexibility
- Redundancy capability
- Operational System Linux
- Low maintenance

SENSORS REQUIREMENTS

- any commercial “off the shelf” sensor device provided with a documented digital output string
- serial output type RS232, RS422 or RS485
- code for the state



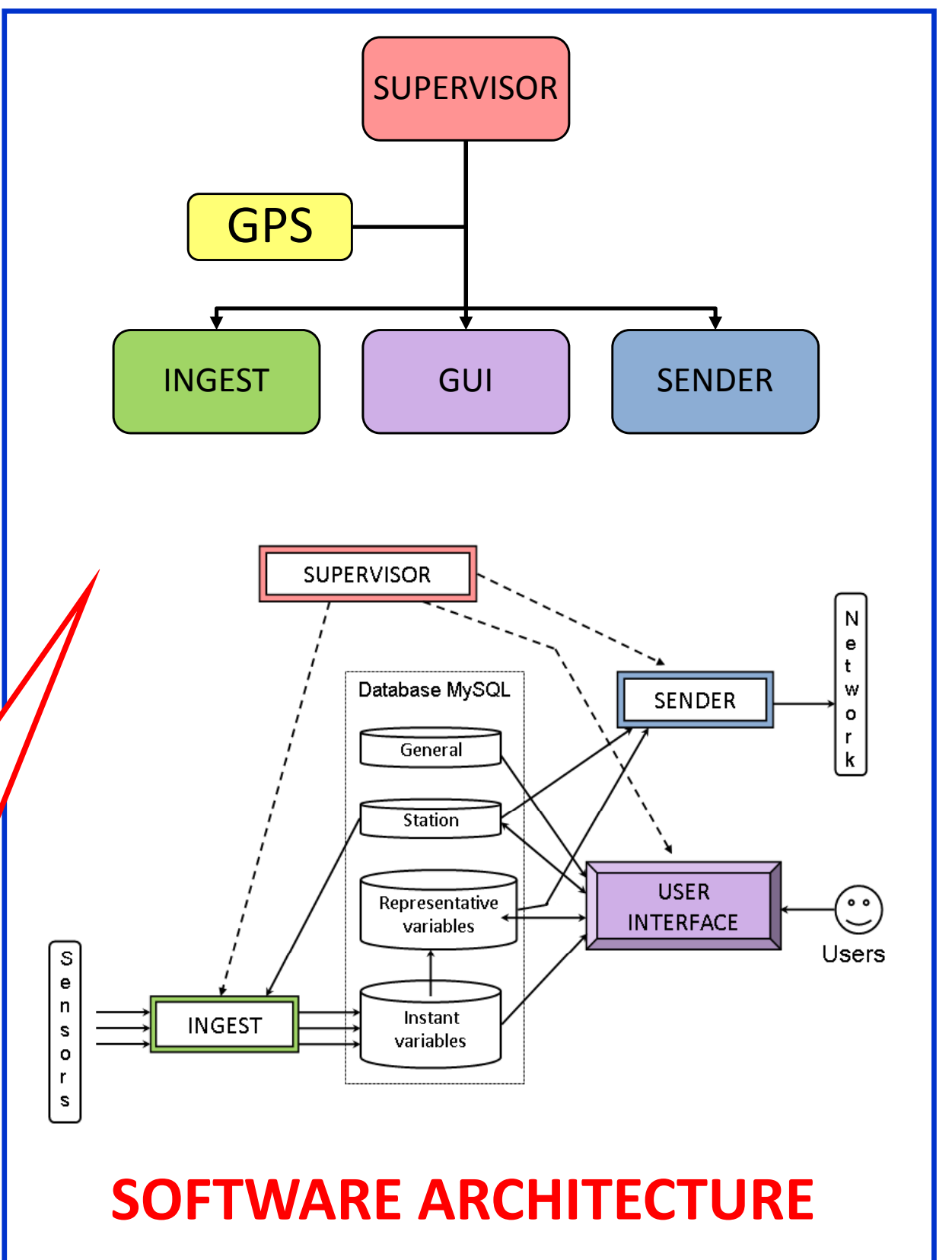
SOFTWARE FEATURES

Operational suite based on free available packages:

- JAVA 2
- PHP + javascript
- Routine Fortran for the BUFR messages coding
- MySQL 5.0.45

Additional components:

- Web Server Apache 2.0
- PHP 5.2.4
- Browser Firefox 2.0.0.6
- Java virtual machine



SWS operating software package is based on three main modules (Ingest, GUI, Sender) controlled by a Supervisor program and on four DB areas. A GPS clock gives the absolute reference time to the computer system

SOFTWARE CONFIGURABILITY

Operating software is completely manageable by means of simple configuration tables accessible by graphical interface:

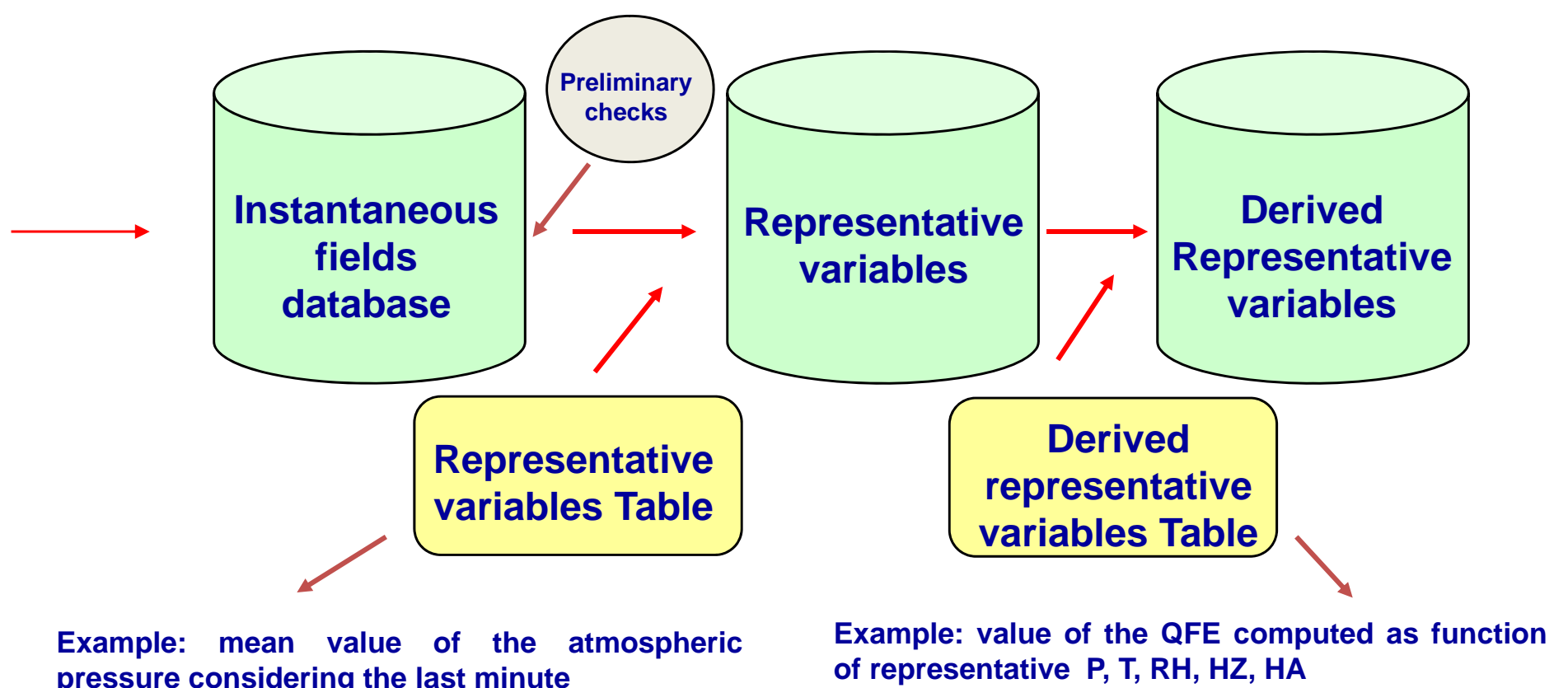
- Site configuration table
- Sensors configuration table
- Data configuration tables (instantaneous variables, preliminary checks parameters, representative and derived representative variables)
- Station services and meteorological messages configuration table
- Networking parameters configuration table

INGEST

Instant fields processing and database creation

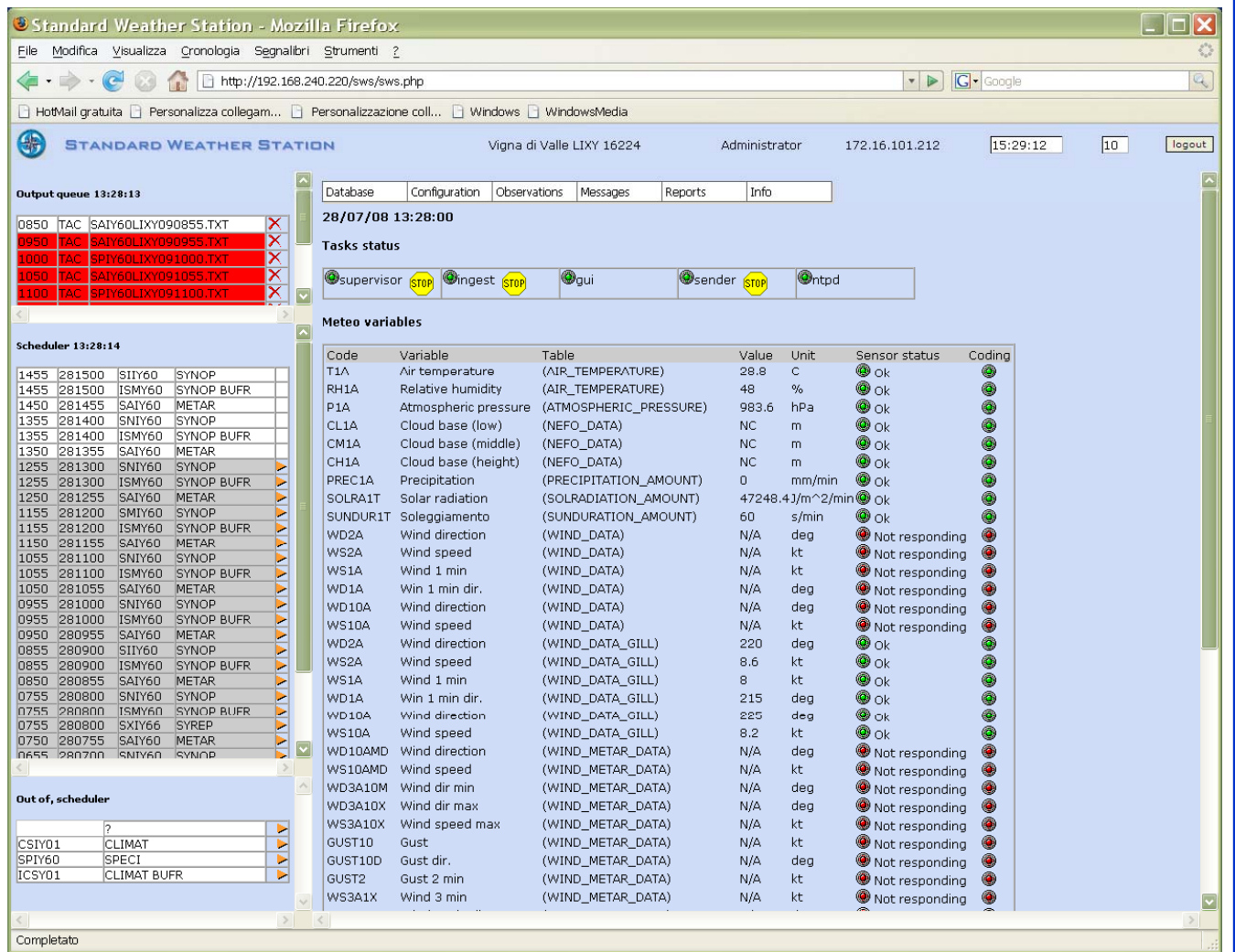
This module:

- gathers, validates, processes and archives atmospheric variables
- creates the *instantaneous variables db* (individual sensor outputs, high sampling frequency)
- creates the *representative variables db* (preliminary checks, data processing, mean values, etc.)
- creates the *derived representative variables db* (Dew point Temperature, QFE, QNH, etc.)



Graphical User Interface (GUI)

This module allows to manage and control the whole SWS (configuration tables, status of the station, data visualization, different users access, observations manual input by operator, production of messages in Traditional Alphanumeric Codes (TAC) and WMO standard BUFR format as defined in the MTDCF “Migration to Table Driven Code Forms”).



SENDER

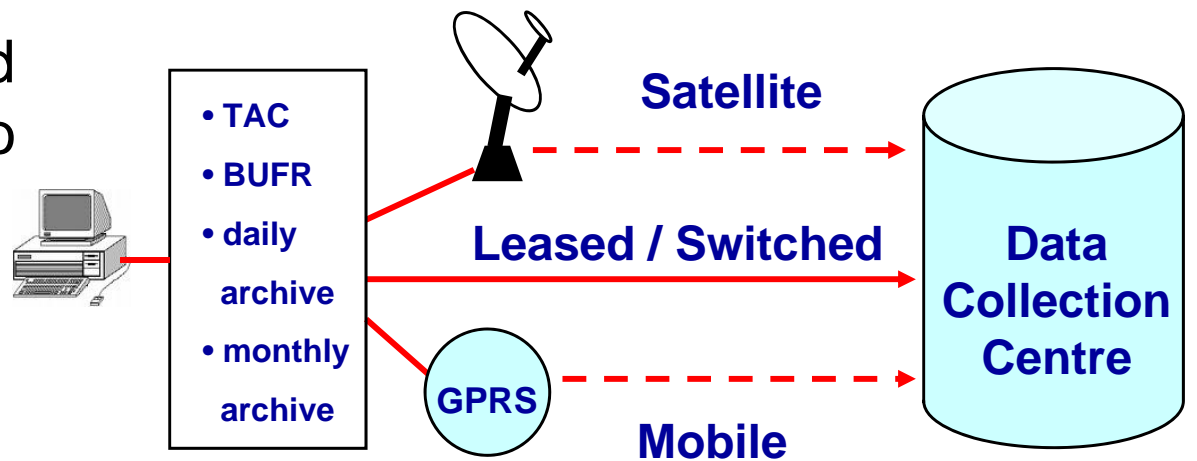
It is responsible for data and messages transmission to remote central and local units.

Types of Protocols:

- TCP/IP via FTP
- Serial (local and/or modem)

Connectivity:

- Leased and switched lines, satellite, GPRS/UMTS
- RS232 line to local services



Communication ports:

- ethernet
- serial
- USB

FUTURE DEVELOPMENTS

- to continue the update of standard export file formats
- to develop different display facilities for different users
- to improve the flexibility of the software package to make the SWS able to operate on ships