

# Vaisala DigiCORA<sup>®</sup> Sounding System for Defense Applications



Introducing the latest  
STANAG METGM message

# All you need to measure the upper-air atmospheric profile.

The Vaisala DigiCORA® Sounding System eases your daily work by ensuring the receiving, processing and forwarding of meteorological information is as easy and secure as possible.

Upper air meteorological observations are necessary for field artillery, MLRS units and UAVs among others. Observations are based on the use of a free flying balloon-carried radiosonde that transmits data to a ground station at a frequency of 400...406 MHz. Pressure, temperature and humidity are measured by the radiosonde's sensors. The speed and direction of wind is determined by means of GPS navigation satellites or Loran-C navigation networks.

Meteorological data for: computer met messages, ballistic met messages, sound ranging and fallout met messages are derived from radiosonde observations. Radiosonde data are also used to calculate the refractive index of the atmosphere to assess the performance of the radars onboard vessel.

The Vaisala DigiCORA® is a Commercial off-the-shelf (COTS) system, which has been adapted for defense applications. It is easy to transport, quick to deploy and needs just one person to operate. Automated data handling and versatile interfacing options make the message transmission easy for all applications in all conditions.

## Complete package

The system is a result of 70 years of Vaisala's experience as a world leader in designing and building sounding equipment.

## Benefits

- Flexibility for multiple applications
- NATO STANAG meteorological messages
- Superior data availability
- The carrying cases are equipped with handles, hinges and latches for padlocks
- The cases have wheels at one end making transport "no sweat"

It is a complete package for measuring the upper-air atmospheric profile. The system integrates sounding control, archiving of sounding data and coding of meteorological messages. It can be set-up with various features to measure pressure, temperature, humidity (PTU) and wind.



# You choose and DigiCORA® does the rest.

## Superior data availability

Vaisala's DigiCORA® sounding system makes extensive use of Software-Defined Radio (SDR) technology. Superior telemetry range of up to 350 km is provided when you use it with the Vaisala Radiosonde RS92-SGP, which has the greatest range of all radiosondes. This outstanding performance is ensured by the excellent bandwidth efficiency of digital transmission combined with excellent error detection and correction.

## P(Y) codeless wind finding

The Vaisala DigiCORA® Sounding System supports P(Y) codeless wind finding when the Vaisala radiosonde RS92-AM is used. This capability is available for defense customers who have access to Precise Positioning Service (PPS) GPS receivers.

P(Y) codeless wind finding is based on the measurement of the Doppler shift of the GPS P(Y) code frequency. Using P(Y) codeless wind finding technology, without using Standard Positioning Service (SPS) GPS signals that could be denied in an international emergency, ensure maximum wind data availability and reliable use of the Vaisala radiosonde RS92-AM.

P(Y) codeless GPS technology is optimized for sounding applications. P(Y) codeless wind finding velocity measurement uncertainty is 0.5 m/s. The radiosonde uses the same high accuracy PTU sensors as other models of the Vaisala radiosonde RS92 family. The P(Y) codeless wind finding together with Vaisala radiosonde RS92-AM has been in operational use since 2005.

In addition to Vaisala's DigiCORA® Sounding System MW31 and sounding software with P(Y) codeless wind finding software, a Precise Positioning Service (PPS) GPS receiver such as the Rockwell-Collins PLGR II or DAGR is also required. The PPS GPS receiver has to be supplied by the customer as Vaisala is not authorized to supply them.

## Easy to carry

The Vaisala DigiCORA® sounding system together with accessories is a compact system, which is easy to carry. The transportation cases are made of cellular polypropylene (EPP), providing excellent cushioning during transport. Necessary accessories such as a small number of radiosondes and balloons can be packed together with the equipment.



# Functions and benefits of standard software and optional STANAG software.

## Standard software for routine soundings

The standard DigiCORA® sounding software is what you need for routine soundings. It provides PTU wind data collecting, processing, message coding and archiving. It can also support radioactivity measurements.

## Graphical options

The optional METGRAPH software module provides you with graphical data outputs. This includes all measured and calculated meteorological parameters.

## NATO specified STANAG message format

Vaisala keeps the software up to date and makes new versions available to ensure your system meets new NATO specifications whenever they change. The Vaisala service contract ensures that the system is kept current.

In addition to the traditional alphanumeric codes, such as STANAG 4082 METCM, the system generates messages in the new STANAG 6022 METGM format.

*The transportation cases are lightweight and easy to carry. The system can be set up in minutes.*

## STANAG software

The STANAG software option includes all the standard NATO meteorological messages for ballistic and other defense applications.

The latest STANAG 6022 METGM Standard Gridded Data Meteorological Message allows gridded meteorological data to be generated. This format may be used to transmit data from the field to met centers for use in atmospheric models.

The STANAG 4082 METCM Standard Computer Meteorological Message is still the most widely used meteorological message by artillery units. It allows meteorological data from surface up to 30 km height to be passed onto fire control computers.

The STANAG 4061 METB3 Standard Ballistic Meteorological Message allows weighted ballistic meteorological data from surface up to 18 km height to be generated and transferred for field artillery ballistic calculations. The METB2 version of the message is for surface to air ballistic calculations.

The STANAG 4140 METTA Standard Target Acquisition Meteorological Message allows meteorological data from surface up to 2600 meter height to be generated and transferred for target acquisition purposes.

THE STANAG 2103 METFM Standard Fallout Meteorological Message allows meteorological data from surface up to 30 km height to be generated and transferred for fallout prediction purposes.

METSR Meteorological Sound Ranging Message allows meteorological data from surface up to 850 meter height to be generated and transferred for sound source location purposes.

# Flexible connectivity for your application needs.

## Flexibility gives you choice

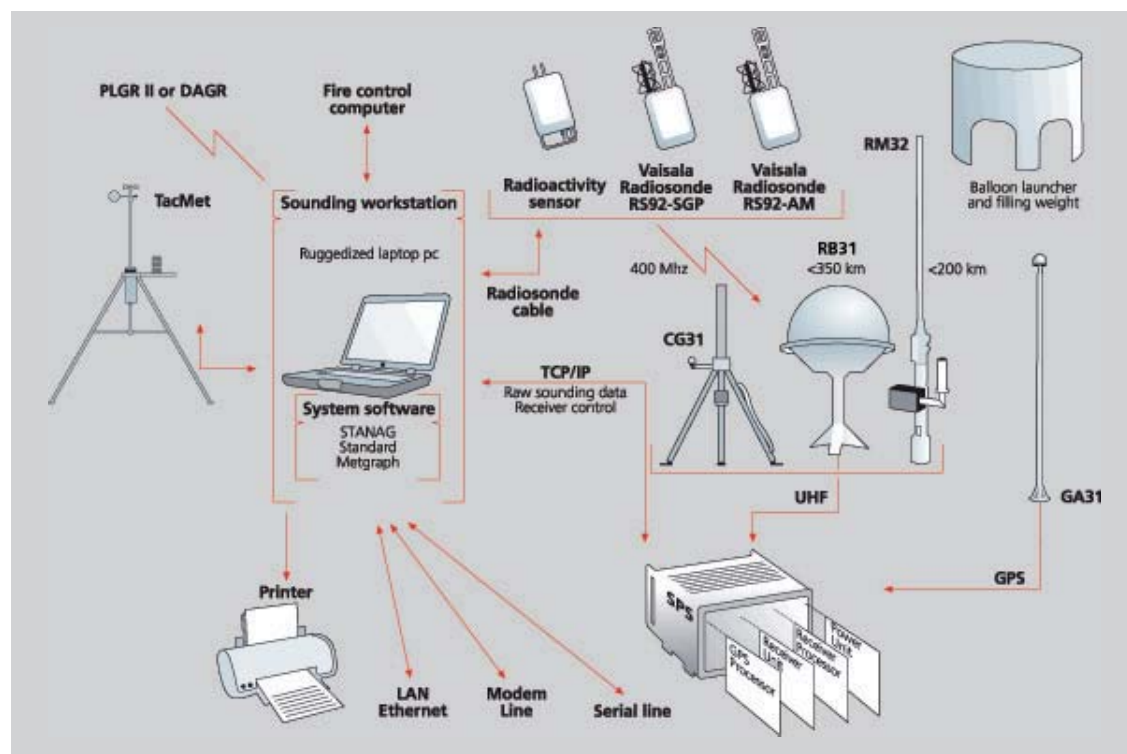
The system functions can be chosen by setting adjustable parameters and triggers. The parameters determine data processing, whereas the triggers monitor sounding progress to initiate actions such as message coding and transfer. The system has an easy script language that enables the creation of individual ASCII format data outputs.

These features offer the flexibility to use the same system for multiple applications, re-configure it to the changing needs and automate many routine tasks.

## The DigiCORA® basic components and functions

- Radiosonde cable can be used to prepare the radiosonde for flight
- Antennas receive the radiosonde and navigational signals
- The sounding processing subsystem (SPS) receives and processes the radiosonde signals and computes wind data
- Sounding workstation together with the sounding software serves as the main computer and user interface

*The Vaisala DigiCORA® can be augmented with a number of additional devices.*



# Technical data

## Vaisala DigiCORA® Sounding System MW31

### SOUNDING WORKSTATION

Pentium® M 1.5 GHz ruggedized laptop PC  
RAM 512 MB minimum  
Hard disk 40GB minimum  
DVD+/-rw  
13.3" TFT display, ruggedized laptop  
Internal modem  
Operating system Windows® XP, pre-installed  
DigiCORA Sounding software, pre-installed:  
Standard software  
STANAG software (optional)  
METGRAPH software (optional)  
System recovery software

### VAISALA SOUNDING PROCESSING SUBSYSTEM SPS311

Supports all Vaisala radiosondes  
Windfinding options:  
Code correlating GPS  
P(Y) codeless GPS  
Radio-direction finding  
(with Vaisala Radiotheodolite RT20A)  
Loran-C with automatic chain selection

### ANTENNAS

Portable antenna on a tripod for UHF and GPS  
Omni-directional UHF antenna  
(fixed or vehicle installations)  
GPS antenna (fixed or vehicle installations)  
Directional UHF antenna (automatic direction control) for fixed installation

### RADIOSONDE CABLE

For frequency and timer setting and reconditioning of Vaisala RS92 radiosondes  
See separate Technical Description for details

### Telemetry

Frequency range 400 - 406 MHz, electronically adjustable  
Tuning step 10 kHz, user adjustable  
Error detection and correction Reed-Solomon  
(with digital radiosondes)  
Telemetry range Up to 350 km  
(with directional antenna and RS92-SGP radiosonde)

## Meteorological messages

### AVAILABLE IN STANAG SOFTWARE:

STANAG 6022 METGM Standard Gridded Data  
Meteorological Message  
STANAG 4082 METCM Standard Artillery Computer  
Meteorological Message  
STANAG 4061 METB3/2 Standard Ballistic  
meteorological Message  
STANAG 4140 METTA Standard Target Acquisition  
Meteorological Message  
STANAG 2103 METFM Standard Fallout  
Meteorological Message  
METSRSound Ranging Meteorological Message

### AVAILABLE IN STANDARD SOFTWARE:

TEMP FM35-XI, TEMP SHIP FM36-XI, TEMP MOBIL FM38-XI  
PILOT FM32-XI, PILOT SHIP FM33-XI, PILOT MOBIL FM34-XI  
CLIMAT TEMP FM75-XII  
BUFR 3'09'052 (for TEMP data)  
BUFR 3'09'050 and BUFR 3'09'051 (for PILOT data)

## Environmental conditions

### INDOOR EQUIPMENT

Operating temperature	0 ... 50°C
Operating humidity	10 ... 90%
Storage temperature	-40 ... +65°C
Storage humidity	5 ... 95% RH

### OUTDOOR EQUIPMENT

Operating temperature	-40 ... +55°C
Operating humidity	0 ... 100%
Operating wind speed	0 ... 65 m/s
Operating precipitation	Unlimited
Storage temperature	-50 ... +100°C
Storage humidity	0 ... 100% RH

## Transportation case dimensions

Vaisala Sounding System MW31	990 x 450 x 410 mm
Vaisala Portable Antenna Set CG31	1330 x 355 x 35 mm



Vaisala Oyj  
Helsinki, Finland  
Tel.: (+358 9) 894 91  
Fax: (+358 9) 8949 2226  
defenseales@vaisala.com

For other Vaisala locations  
visit us at:  
[www.vaisala.com/defense](http://www.vaisala.com/defense)

