- **AIRPORT**
  Small Airport Weather Observation System (SAWOS or AWOS)

- **HELIPORT**
  HELIPORT Weather Observation System (HWOS or AWOS)

AUTO-METAR every 30min + AUTO-SPECI

ezMETAR Weather Observation System

Wireless meteorological weather monitoring system with GSM data transmission in addition to over the wire serial data communication. Features auto-METAR generation including automatic SPECI report generation when there is significant change in airport weather conditions.

Auto-METAR and SPECI generation per ICAO guidelines:

- WMO – No.49, Technical Regulations, Volume II – Meteorological Service for International Air Navigation. Edition 2016.

Affordable Solution

For small private or civil airports, heliports and airstrips with VFR flight rules and limited air traffic that require a minimum set of sensors. METAR is supplied wirelessly via GSM to enable quick and easy certification of the weather monitoring system installation on airport grounds without need for special building permits. Minimum included sensor set:

- Wind speed & wind direction
- Air temperature
- Relative humidity
- Barometric pressure

Analog Inputs	**8**
Single Ended (12bit)	4x 0 ... 2.5V
Differential (24bit)	4x ±19mV ... ±2.5V
Accuracy	0.1% SE	0.05% DIFF
Input Noise	cca 0.2µVef
Input Offset	0.5µV max
Statistics	Avg, Min, Max, StDev

Digital Inputs	**4**
Input Range	0...2kHz

Configurable to:

- Frequency (wind speed)
- Time period (sunshine duration)
- Counter (rain gauge)

PT100 Inputs	**3** (+ 1 reference)

- Ratiometric measurements
  (for 4 wire PT100 precision connection)
- Excitation for PT100 cca 0.5mA

Serial Sensors	**8** (RS-485 or RS-232)
Baud Rate	300...115kBaud
Measurement Interval	1...3600 s
Logging Interval	1...3600 s

High reliability wired data

For systems requiring a wired data connection, RS-232 MODBUS RTU and serial ASCII real-time data streams are available for integration with existing airport infrastructure.

FUTURE Proof and expandable for future growth

Full METAR report generation and triple-redundant pressure sensor for IFR airports including ceilometer for cloud base identification are easily added.

Full lightning & power protection

For high system reliability and up time, ezMETAR comes with AWOS PowerProtect or PowerProtect-Plus advanced power management and full triple-level lightning protection on all sensor data and power lines, including low-level power protection and fault isolation, intelligent battery power management and smart solar charger plus other safety features.

For VFR heliports & airports where future scalability is important.

UPGRADE TO SIMPLE-TO-USE HARDWARE
based on hardware which is in service in over 2000 locations worldwide for 10+ years

ezMETAR Airport AWOS

BARANIDESIGN

Interface ports
2 (PLC, SCADA, PC...) data connection selectable (8 sensors)
- RS232
- RS485 / RS232

Remote Data Transfer
Full support for GPRS email and FTP data transfer

Memory
Internal Memory	4MB
Data Storage Medium	512MB

Industrial SD memory card (FAT32) is standard and upgradeable.

Realtime Clock
Time Synchronization	Cellular
Time synchronization frequency	1/day
Time Zones worldwide	
Backup Battery	3V lithium

Power Consumption
Sleep	40µA max
Measuring	7mA typ
Transmitting	signal strength dependent

Battery Management
Battery type	12V Pb

Power Options
DC source with battery charging	5V ...12VDC
DC source without battery	4V... 20VDC
Solar power	12V system

Environmental Operating Range
Temperature Range	-40°C ...+60°C
Protection	IP65

Visual Indicators
Indication	3 LEDs

Green = Busy, Red = Status, Blue = Charger

New sensor drivers for RS485 or RS232, MODBUS configuration of registers, data types, units, ...
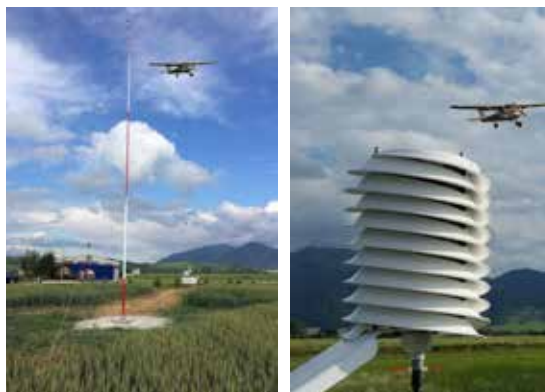
METARlogGSM - the heart of each ezMETAR system

At the heart of this Automatic Weather Observation Station (AWOS) is the all-in-one data logger and AUTO-METAR generator. METARlogGSM meteorological data logger offers you superior flexibility and freedom of choice, both in long and short term.

Wired serial and wireless cellular GSM data output provides redundant direct METAR and SPECI message generation in text format to any PC, FTP server or email of your choice. Available parts of METAR & SPECI message are limited only by the connected sensors.

Automatic METAR & SPECI message generation

Simple, accurate, reliable and meeting strict operative and technical aspects of small airports. This METAR generation system can be operated as stand alone equipment at unmanned airports or integrated into local infrastructure and software at manned airports.

Meeting the standards

METARlogGSM AWOS is developed in accordance with ICAO and WMO regulations. The system features hardware based auto METAR/SPECI message generation for stable real-time responsiveness to changing weather conditions.

Real-time meteorological data

Raw live meteorological data for external systems can be read out wirelessly to the same or different FTP address than specified for the METAR, or via a serial connection in ASCII text format or via MODBUS RTU for interfacing with your existing airport infrastructure and software.

Minimize components, ease installation for reliable performance

METARlogGSM can be adapted to meet the requirements of different heliports, airports and airstrips from small unmanned to complex domestic and international airports.

Reliable and future-proof expandable hardware

METARlogGSM is a system based on proven hardware and offers a reliable, flexible and future-proof solution for airports and heliports. It is at the forefront of AWOS systems on the market in terms hardware flexibility and affordability.

TECHNICAL FEATURES:
- Easy expandability to a full suite of sensors for full METAR report generation.
- Built-in watchdog timers and low-level intelligence ensure reliable operation which has been verified over the years.
- Analog sensor front end offers 4 inputs with 12 bit resolution (relative humidity, wind direction...) and 4 inputs with 24 bit resolution for precision measurements (temperature, solar radiation, pressure...).
- Each of the 4 digital inputs can be user configured to measure frequency (wind speed), time period (sunshine duration) or as a counter (rain gauge).
- Serial RS-232 data port for connection to PC or 3rd party devices and a user selectable RS232/485 port for connecting smart sensors and other devices.
- All inputs are software configurable and offer basic statistics - average, minimum, maximum and standard deviation. 16 user defined polynomes (polynomials) are used for calculation to convert raw sensor values to engineering units.
- Internal memory of 4MB and reliable industrial SD memory card are used for data backup and storage.
- Real time clock with 3V lithium backup battery with time synchronization once a day over GPRS network with worldwide time zones.
- Remote data transfer is supported by software via email or FTP using integrated quad-band GSM/GPRS modem (LTE coming soon).

Reach your Gold Standard of measurement with BARANI sensors. ISO:9001 quality.

METAR & SPECI report format of wireless GPRS or LTE output

Example METAR messages follow (over GSM or wire):
METAR LZJS 071600Z AUTO CALM //// //// 25/09 Q0977=
METAR LZJS 121140Z AUTO VRB05KT //// //// 06/04 Q0965=
METAR LZJS 121220Z AUTO 22007KT 160V290 //// //// 06/03 Q0964=

...

Exampe SPECI reports follow (over GSM or wire):
SPECI LZJS 080925Z AUTO 22012G24KT 160V290 //// //// 07/03 Q0975=
SPECI LZJS 081039Z AUTO 22015G34KT 150V280 //// //// 08/04 Q0975=

...

METAR & SPECI report detailed format is derived from available sensors. //// are used where sensor data is unavailable.

SPECI is an aviation special weather report issued when there is significant deterioration or improvement in airport weather conditions, such as significant changes of surface winds, visibility, cloud base height and occurrence of severe weather.

Real-time wired data output over MODBUS RTU or over Serial ASCII

MODBUS RTU:

IEEE754 32 bit float numbers (standard).

Response: Last measured values from OUT1...OUT32. Each number is a float number (4 Bytes and made of two Modbus registers, Hi & Lo)

Map example:

OUTPUT	MODBUS REGISTER	
	Dec	hex
OUT1 MSW	100	0x64
OUT1 LSW	101	0x65
OUT2 MSW	102	0x66
OUT2 LSW	103	0x67
OUT3 MSW	104	0x68
OUT4 LSW	105	0x69
...		
OUT32 MSW	162	0xA2
OUT32 LSW	163	0xA3

Read input registers uses 0x04 query.
The number of read out registers has to be even.
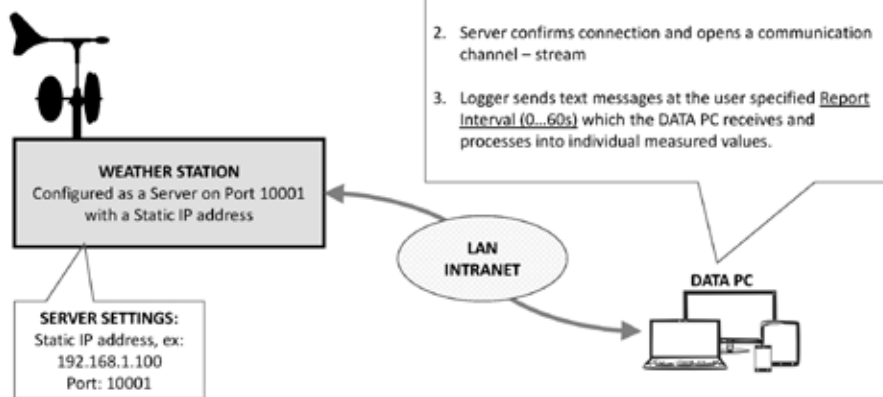Logger RS-485 address range from 00...99.

SERIAL ASCII OUTPUT DATA FORMAT:

Date Time Data1 Data2 Data3... CRLF

Example: (space delimited format)

07.06.2017 04:43:39 3.117 13.839 99.043 -61.000
07.06.2017 04:43:39 3.117 13.839 99.043 -61.000

...

If required, CSV data format can be set:

07.06.2017,04:43:39,3.117,13.839,99.043,-61.000

...

EXAMPLE CONECTION WITH DATA PC:

1. DATA PC opens a socket connection with the weather station server on 192.168.0.100:10001

2. Server confirms connection and opens a communication channel – stream

3. Logger sends text messages at the user specified Report Interval (0...60s) which the DATA PC receives and processes into individual measured values.

WEATHER STATION
Configured as a Server on Port 10001
with a Static IP address

LAN INTRANET

DATA PC

SERVER SETTINGS:
Static IP address, ex:
192.168.1.100
Port: 10001

Ethernet connectivity instructions:

HOW TO CONNECT A PC TO THE WEATHER STATION VIA ETHERNET:

1. The RS-232 to Ethernet converter inside METARlogGSM is configured as a Server, which is listening on Port 10001. It has a fixed IP address. IP address and port are both user configurable. (Example:192.168.0.100:10001)

2. The internal Ethernet converter starts actively listening on Port 10001 immediately after METARlogGSM is powered on.

3. When it receives a request to connect from a DataPC via the Ethernet connection, together they create an open bi-directional data stream. (This connection can be verified by setting up a connection on 192.168.0.100:10001 in HyperTerminal on the DataPC.)

4. Weather station and DataPC are connected and sending live data. (In HyperTerminal you should see text messages of measured values.)

5. DataPC must collect the data that it receives.

6. In case of an interruption in the connection with METARlogGSM, the connection will remain closed until it receives a request to reconnect from the DataPC.