

## AUTOMATED WEATHER SENSORS SYSTEM

The Automated Weather Sensor System (AWSS) is a surface weather observing system. AWSS provides minute-by-minute weather observations. The output from the AWSS can be read at various displays. Voice messages from the AWSS are available through telephone dial-in access and are broadcast directly to pilots via ground-to-air radio.

The AWSS sensors are interfaced to the Field Data Collection Unit (FDCU). The FDCU is a versatile data acquisition system that acquires sensor data from a wide variety of sensors. Various interfaces including analog, frequency, and serial data are used. The barometric pressure sensor is mounted inside the FDCU. All other AWSS sensors are external to the FDCU.

The FDCU communicates with the Terminal Data Acquisition Unit (TDAU) over a UHF radio data link. The TDAU runs the weather algorithms and provides information to the users and other system via a variety of interfaces. The Operator Interface Device (OID) is a PC and keyboard emulating a VT 220 terminal. The OID is the primary display of the AWSS. The Video Display Unit is a VT 220 terminal. The VDU is a display only device and does not include a keyboard.

### Present Weather Sensor

The present weather sensor measures precipitation by detecting the optical irregularities induced by particles falling through a beam of partially coherent infrared light

### Forward Scatter Visibility Sensor

The Visibility Sensor is an active electro-optical instrument that determines visibility by measuring the optical extinction coefficient of a beam of light as it passes through a known volume of air.

### Tipping Bucket Rain Gauge

The Tipping Bucket Rain Gauge is a precision sensor used to measure rainfall volume/or rate.

### Ceilometer

A GaAs laser diode in the ceilometer emits a laser pulse, which is partially reflected from the cloud. The time from when a pulse leaves the transmitter to when the reflected portion reaches the receiver varies with cloud height.

### Freezing Rain Sensor

The freezing rain sensor detects an occurrence of freezing rain by the change in the probe tip's oscillating frequency.

### Uninterruptible Power Source

The UPS provides backup power in the event of loss of primary power.

### Wind Speed Sensor

A low-threshold three-cup anemometer mounted to the top of the tower measures wind speed.

### Wind Direction Sensor

A highly sensitive vane mounted to the top of the tower measures wind direction.

### Motor Aspirated Radiation Shield with temperature & Relative Humidity Sensor

The Temperature/Humidity sensor is housed in a Motor Aspirated Radiation Shield (MARS). The MARS is designed to adequately ventilate the probe, while at the same time shielding it from direct and reflected solar radiation and from direct moisture contact.

### Field Data Collection Unit (FDCU)

The FDCU collects the sensors' output and transmits it to the Terminal Data Acquisition Unit (TDAU) in the tower. The FDCU also houses the Barometric Pressure sensor.

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