MILOS 520 Data Collection and Processing System

Weather in Extreme Environmental Conditions

The MILOS 520 Data Collection and Processing System is designed to satisfy the current and future requirements for Automatic Weather Stations that are accurate, reliable and economical in terms of overall costs through the entire life cycle of a system. The MILOS 520 system’s flexible set-up in a Windows environment guarantees user-friendly configuration.

New enhanced MILOS 520

The MILOS 520 system can be interfaced with practically any analog or digital sensor. The sensor interfaces allow the measurement of standard meteorological variables such as wind, temperature, relative humidity, pressure, solar radiation, cloud height, visibility and current weather. Many other measurements such as precipitation, snow height, air quality and hydrological parameters are also catered for. Special attention has been paid to interfacing with intelligent sensors via RS serial lines. Up to 10 serial lines are available for interfacing with sensors and communication devices.

The MILOS 520 supports message coding in WMO formats such as SYNOP, METAR and SPECI, as well as user-defined formats. User-specified alarm messages can be generated based on the threshold limits set for any input or calculated measurement.

Various types of data output and telemetry options are supported, including RS lines, modems, radio, satellite, cellular phone or a combination of these.

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Designed for extreme conditions at remote unmanned sites, the MILOS 520 offers system integration functions never seen before in a single automatic weather station.
Vaisala’s new MILOS 520 Data Collection and Processing System measures dozens of variables in user-configurable sensor configurations. The system has field-proven reliability and accuracy in extreme environmental conditions and is easily expandable by the user, thanks to the building block principle. With powerful data storage, analysis and report formatting at measurement sites, the MILOS 520 is ideal for unmanned remote sites.

The new MILOS 520 data collection and processing system.

The set-up of the MILOS 520 has been made easy with the “Your Way for Windows” configuration software. The sensor settings, command sets, measuring algorithms, calculations and report formats can be selected from a pre-defined library. The user has the freedom to modify these default settings, use his own preferred values or create completely new ones. The simple icons, menus, libraries and ‘drag-and-drop’ tools of this Windows-based program help speed up the configuration work.

The configuration files may be downloaded directly from your PC (even to a remote site by way of a modem), or by using a small and secure PCMCIA memory card. MILOS 520 systems are supplied either fully configured to meet the customer’s specifications or together with the “Your Way” program. Vaisala provides comprehensive training courses on its own and the customer’s premises.

**The basic set**

The DME50 Frame houses the MILOS 520 basic card set and optional units, including the pressure sensor from the DPA500 series.

The DMC50B CPU Board is a powerful 16-bit processor board with low power consumption. The program codes with the application-specific configuration files and calibration data are located in secure FLASH EPROMs. Static RAM memory is used for the database and variables. The DMC50B has four configurable RS-232/422/423/485 serial lines for data transmission and interfacing with intelligent sensors. It has a multi-tasking real-time operating system for processing the data in-situ. Calculations and statistical analysis, as well as report and alarm generation, can be done in real time.

The DPS50 DC/DC Converter is a combined floating DC power supply and battery charger. The DPS50 has built-in overvoltage and overcurrent protections. The input voltage can vary from 11.5 to 80 VDC or 12 to 50 VAC (47...400 Hz).

**Sensor interfacing**

The multi-purpose DM150 Sensor Interface Board handles several types of measurements including DC voltages, resistances and bridges, Pt-100 sensors, frequency and period measurements, as well as parallel digital inputs. The DM150 has 8 single-ended (or 4 differential) voltage measurement channels and 8 digital input/output channels. Two of the differential channels can be used as high accuracy Pt-100 channels. Two of the digital channels are used to measure frequencies up to 10 kHz. The DM150 also provides sensor excitation. All inputs and outputs have ESD (Electro Static Discharge) and overvoltage/overcurrent protection.

The DMA50 Analog Interface Board is an interface for analog sensors. It also supplies sensor excitation with precise voltage levels. The input channels are configurable as follows:

- Maximum 16 single-ended or 8 differential voltage inputs (or a combination of these).
- Any of the 8 differential inputs can be configured for current measurement by adding a 100 ohm precision resistor (0.01%) to the on-board solder tabs.
- Any of the differential inputs can be configured for a thermocouple measurement. An on-board Pt-100 is provided for cold-junction compensation.

The DML50 LAN Board provides up to 6 more RS-serial I/O ports. There are four RS-232 ports and two ports which can be equipped with optional RS-485 plug-in modules. The Operating System is especially tuned for handling multiple I/O ports.

**Versatile data storage**

The DMM50A Memory Unit consists of two memory drives supporting the PCMCIA industry standard. It allows recording of a vast amount of data on removable memory cards. The memory card can also be used for downloading application-specific parameters and new program files. The memory cards make transportability of software and data files as simple as using a floppy disk, but safer and easier. Microsoft’s Flash File system is supported and therefore the card can be read directly by any PC with a built-in PCMCIA drive or by using an external reader.

The DMM55B Memory Board has a capacity of 2 Mbytes of SRAM. Daily file structure is used for data storage. The contents of the recorded files are configurable. The data can be accessed through one of the serial lines and also remotely by modem or radio. The board has its own internal lithium battery to guard the stored data against power cuts and when the board is removed from the MILOS 520.

**Modem communication**

The DMX50 Modem Board is a multi-standard modem especially designed for the MILOS 520. It supports 300 to 2400 bit/s communication and up to the V.42 standard. It suits both fixed and dial-up lines. Other functions include an extended AT-2400 command set, auto-answer and auto-dial, speed conversion capability and MNP 2-5 error correction and data compression. The DMX50 is fully specified over the entire temperature range of the MILOS 520.

The DMX55 Modem Board is a modem for fixed line communication. It supports 300/1200 baud communication and the V.21, V.22, V.22bis and V.23 standards.

**Voice output**

The DMV511 Voice Synthesizer card provides spoken output of messages. The DMV511 has the default vocabulary stored on its Flash EPROM. Several output reports can be configured using Your Way software.
The Your Way software enables flexible configuring of the MILOS 520 measuring systems to meet the requirements of many different applications ranging from typical synoptic and climatological stations to the research type of station, with dozens of sensors and taking advantage of various communications devices.

The Your Way for Windows software package is designed for the Windows operating system. In addition to all the benefits achieved with the user-friendly approach of Windows, the new Your Way also includes several improvements to the MILOS 520 configuration concept. The program operation is more intuitive. The hierarchy for accessing information is simpler (just one mouse click away). Printing and reporting features and tools for analyzing and modifying the whole configuration have been added, and automatic data validity checking has now also been included.

For various applications

The MILOS 520 offers a flexible platform for setting up various kinds of measuring system - from small systems to integrated multi-functional stations with a multitude of different sensors, displays and communication terminals. It is modular and cost-effective, with high processing power and flexibility in terms of system configuration.

Designed for extreme conditions at remote unmanned sites, the MILOS 520 offers system integration functions never seen before in a single automatic weather station. Over one thousand installations, from Antarctica to the tropics, have defined a new, field-proven standard for reliable, accurate and economical environmental data collection, processing and reporting.

The MILOS 520 can be used in a wide range of meteorological applications, including fully and semi-automatic synoptic stations, onboard ships and oil-platforms, and research systems.

Automated observation systems improve the efficiency, accuracy and consistency of the collected data, and lower the cost of ownership of an observation network. Computer technology has allowed fast improvements in data processing.

At stations with observers present, the MILOS 520 can be used for making routine measurements. Using the Your Link terminal software, the operator can enter the data of those observations which are impossible or too expensive to automate. Alternatively, the station can operate fully automatically when the operator is not present, e.g. during the night time.

In addition to synoptic and long-term climatological measurements, Automatic Weather Stations are frequently needed for research purposes, and for making routine meteorological and environmental measurements for the support of everyday operations including shipping, industry, water resources management, energy production and air quality monitoring. These measurements are aimed at improving the quality and efficiency of operations or safeguarding human life and investments.

System requirements for the Your Way program
- 486 IBM compatible computer
- 8 MB of random-access memory (RAM)
- Microsoft Windows 3.1 or later
- Windows compatible mouse
- preferably a SVGA color monitor, at the minimum a color VGA monitor

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