



Microsigma srl

SeaNet

Ship's Data Products Family

OVERVIEW

The **SeaNet** ship's data products represent a powerful and innovative solution to most interface problems typically encountered in the integration of a complex ship's data distribution network. The **SeaNet** family modules are able to acquire, process, amplify or monitor the output signals generated by the most common navigation sensors and to distribute the processed data with the electrical levels and power required by the loads. The **SeaNet** products are especially suitable when a ship's data distribution system is modified or updated with new subsystems which accept or deliver data in not-compatible formats. Thanks to the modular conception, **SeaNet** allows the User to easily modify and maintain the data distribution network with limited modifications - if any - to the base architecture.

The system can be configured for any combat system: the number of input and output signals is flexible and the electrical characteristics of each signal can be changed as necessary. The system is able to display (on the local LCD or remote multifunction units such as DMF903) any information, sensor or maintenance data processed by the Unit.

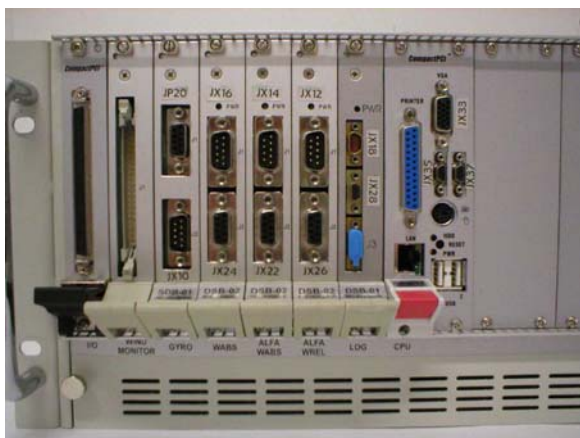
The modular conception of **SeaNet** also features the major advantage of a limited logistic support and a limited number of spare parts (less than 10 items, typically) even when the system is employed on different ship's classes; configuration may vary but spare parts remain the same!

A **SeaNet** system, when installed on military ships, is able to perform, on a single unit, the same functions which are traditionally carried out by many different sub-systems, such as:

- Wind Computer
- Ship's Data Distribution
- Ship's Data Display
- Synchro-signal amplifier
- Acquisition, logging and displaying of Meteo Data
- Data and signal conversion

SeaNet MODULES

Systems based on the **SeaNet** architecture can interface all the traditional ship's data navigation sensors (Gyro Compass, Speed Log, Anemometers, Meteo sensors, GPS etc.), process input data and convert signals. To play this role, the **SeaNet** systems are designed to receive and transmit data in the most popular electrical formats, such as RS232 / 422 / 485, digital I/O, analog I/O, also providing the capability of receiving and transmitting synchro signals in the 50-500 Hz frequency range.



The Processing Unit of the **SeaNet** system consists of a 3U CompactPCI CPU on a standard 19" rack, 8 or 14 slot. The base version of the system employs a Pentium MMX 226MHz CPU board.

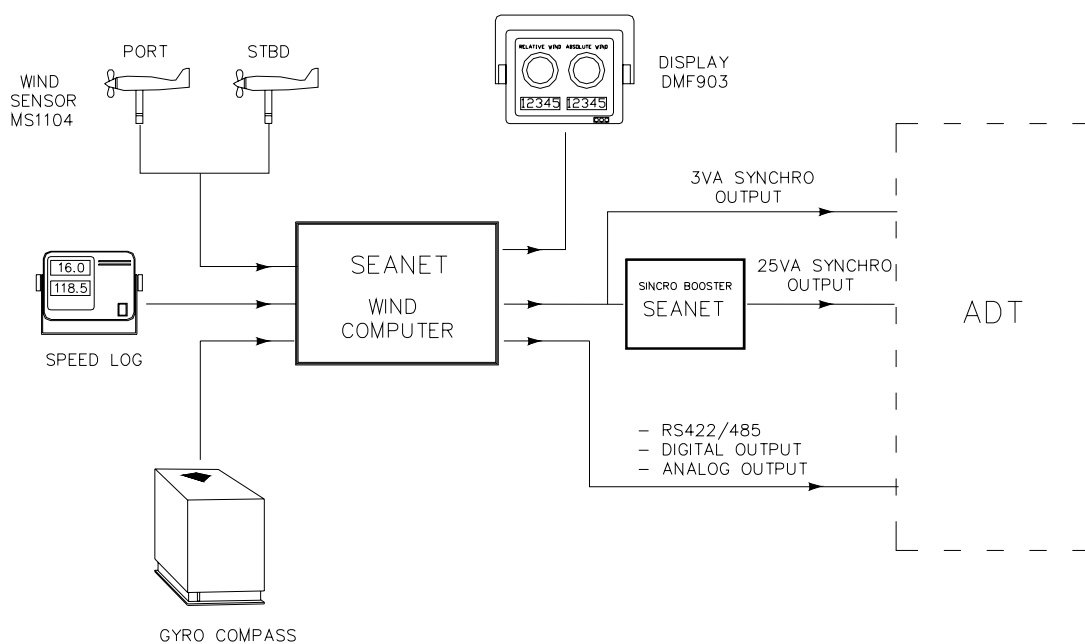
To interface external sensors and loads, the **SeaNet** family is featured with a complete set of interface boards which allows the Processing Unit to receive and transmit the most popular electric

signals:

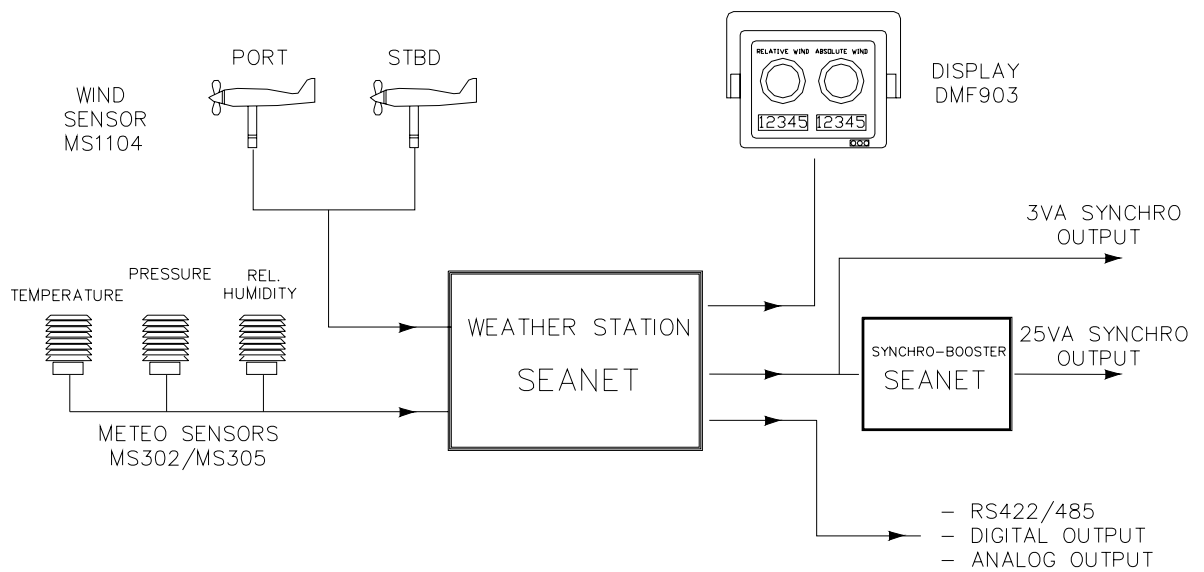
- 60 / 400 Hz Synchro-to-digital conversion board MS3710
- 60 / 400 Hz Digital-to-Synchro conversion board MS3720
- Mixed digital and analog I/O board MS3740
- Serial conversion / isolation board MS3750
- Anemometer interface board MS3760
- Synchro-Booster module MS3780

Boards and modules offered by the **SeaNet** family allow the User to “assemble”, in a simple and flexible way, many different types of computing architectures widely used in naval applications, such as:

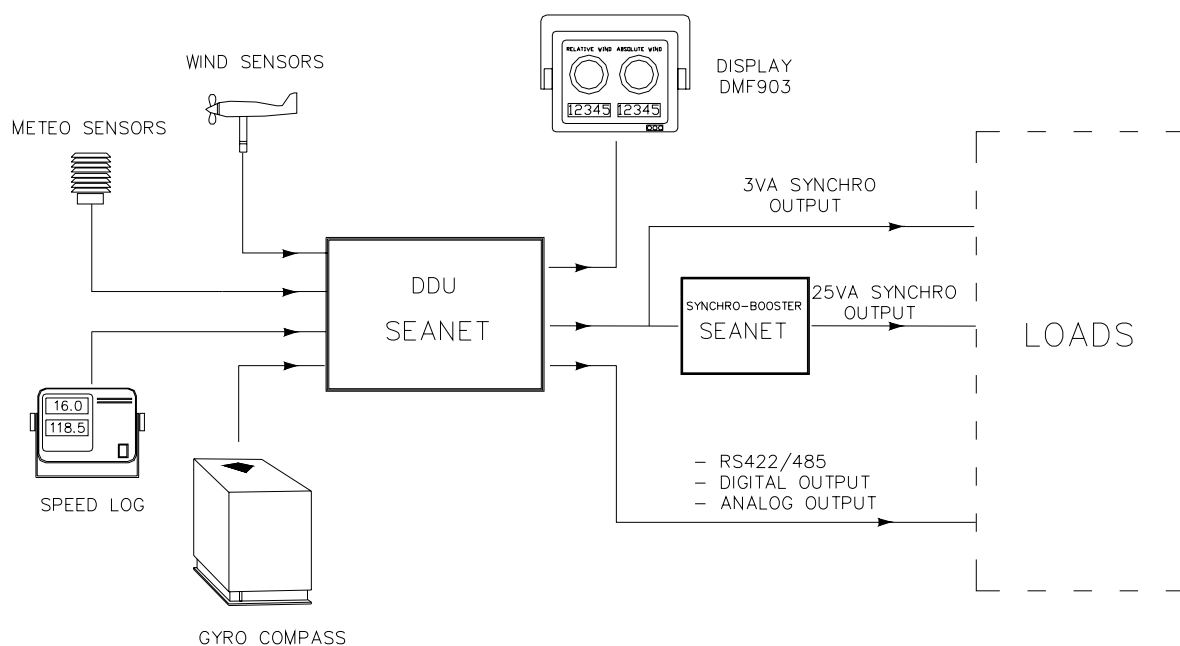
Wind Computer: the Wind Computer receives the input signals from 1 or 2 Anemometers, Gyro Compass and Speed Log, computes the absolute wind vector and distributes data in the electrical standard required by the loads;



Weather Station: this system interfaces meteo sensors (temperature, pressure, rel. humidity, dew point etc.), processes and distributes data to the relevant users; the memory capability of the Unit allows the hystorical analysis of each input and the data display in a graphic window;



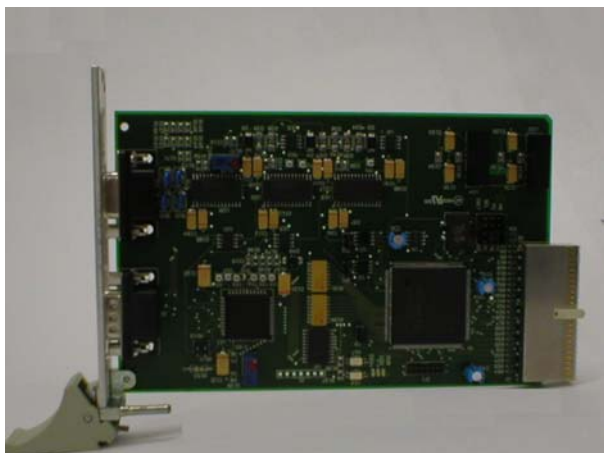
- **Data Distribution Unit (DDU):** this system is interfaced with navigation sensors (such as Gyro Compass, Speed Log, Anemometer, Meteo Sensors etc.), computes and distributes data to the external loads; when integrated with the SSA, it also allows the amplification of synchro signals up to 25VA;



- **Sincro Signal Amplifier (SSA):** this Unit amplifies low-power synchro signals and generates high-power, galvanically isolated synchro signals which are capable of driving external loads up to 25VA; the equipment is available both in the stand-alone version and the 19" rack version.

SOFTWARE

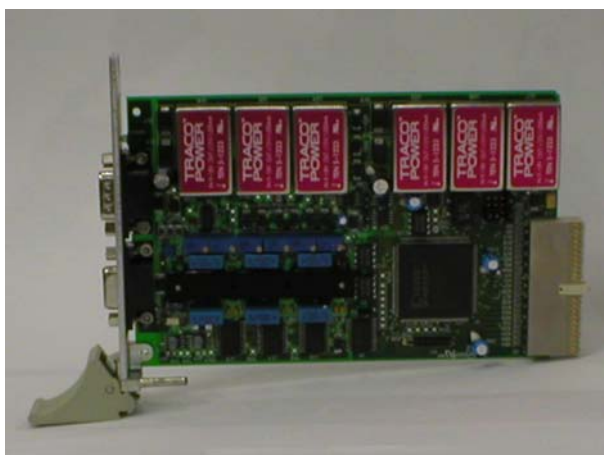
The software package of the system can be customized as required by the external Units and following User's specifications. In general, thanks to the computing power of the CPU Unit, it is possible to program the system for many different functions, such as:



SYNCHRO-TO-DIGITAL BOARD MS3720

- data conversion to and from any common format (for example, receiving a serial data and transmitting the same data in synchro format)

- data computing: for example, evaluating the absolute wind vector from the relative wind vector and navigation data



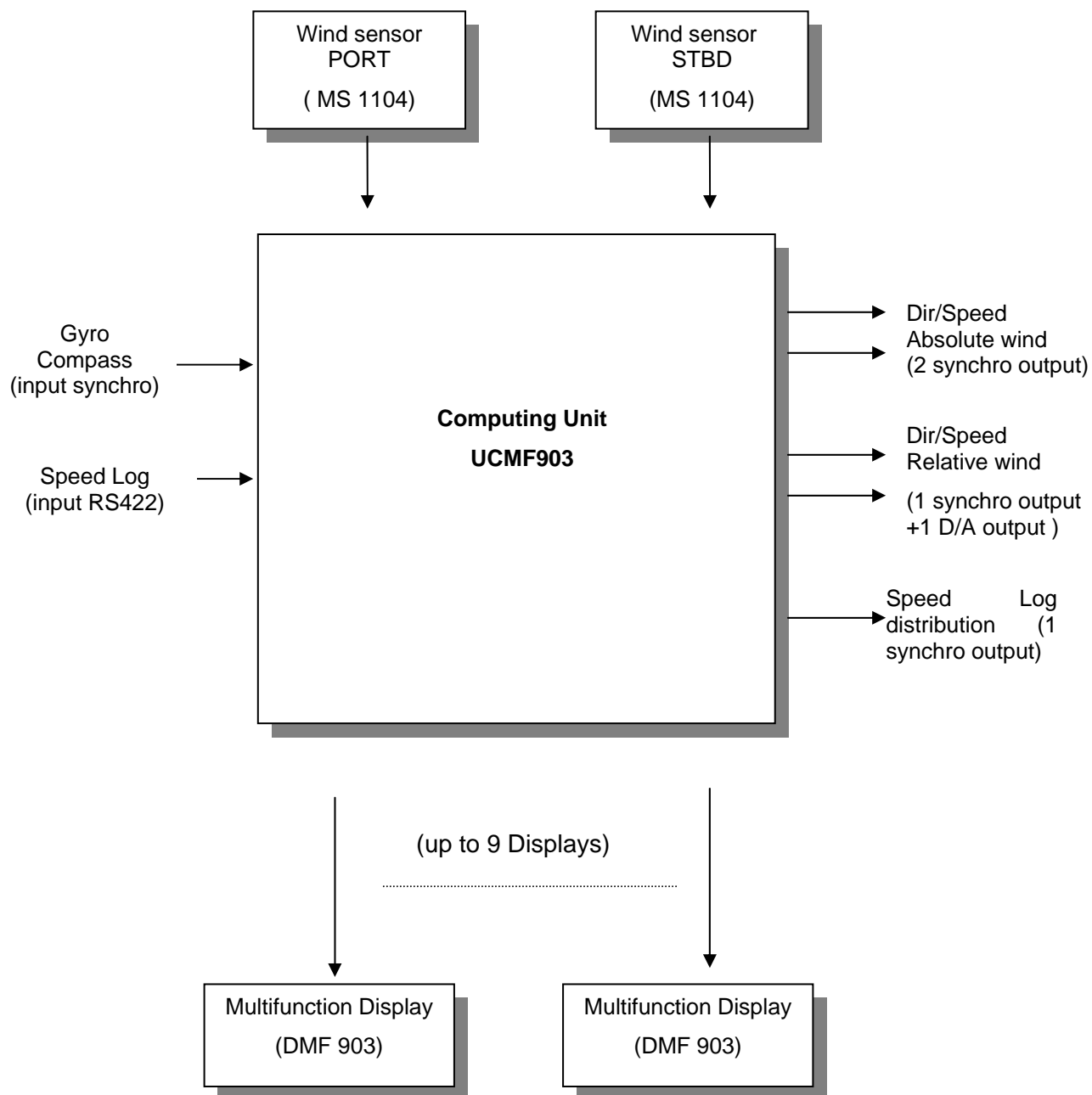
DIGITAL-TO-SYNCHRO BOARD MS3710

- testing all input and output signals using the local keyboard

- simulating input or output data during installation and maintenance of the system or of the external units

- displaying navigation data on the local LCD monitor or remote multifunction displays.

The following block diagram shows the UCMF903 Wind Computer, based on the *SeaNet* architecture.



The following figures illustrate the graphic display of relative and absolute wind and the test menu of the above system.

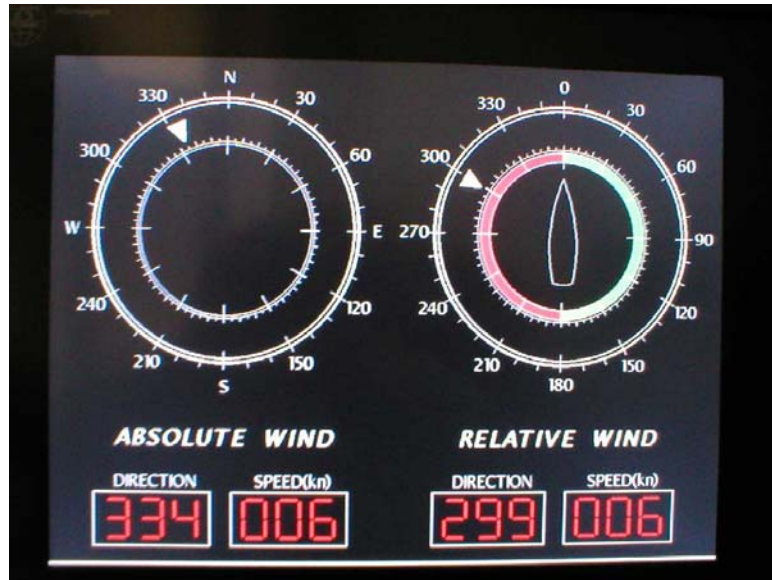


Fig. 2 - UCMF903: local display, absolute and relative wind data

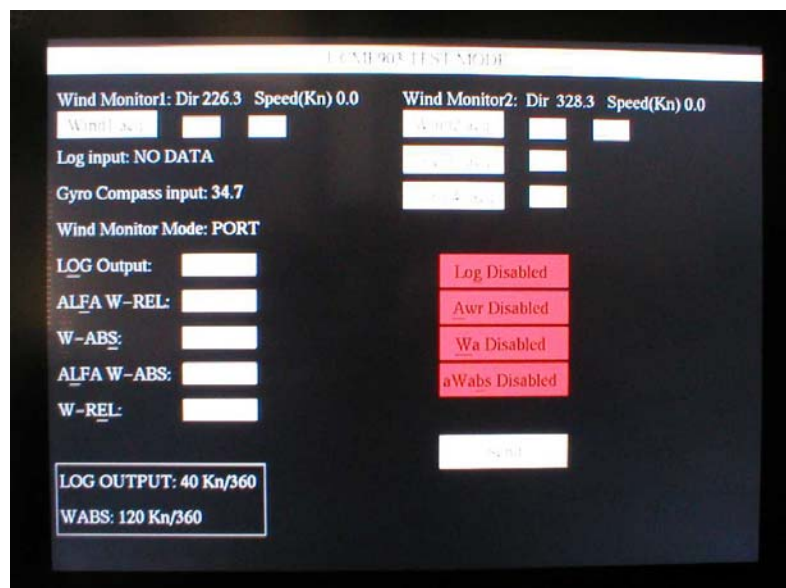


Fig. 3 - UCMF903: local display, test menu

MS3701 CPU Board

The MS3701 CPU consists of a 3U CompactPCI low-power board, featuring a Pentium MMX 266MHz microprocessor and in accordance with CompactPCI PICMG 2.0 R2.1. The following Table illustrates the technical data of the board:

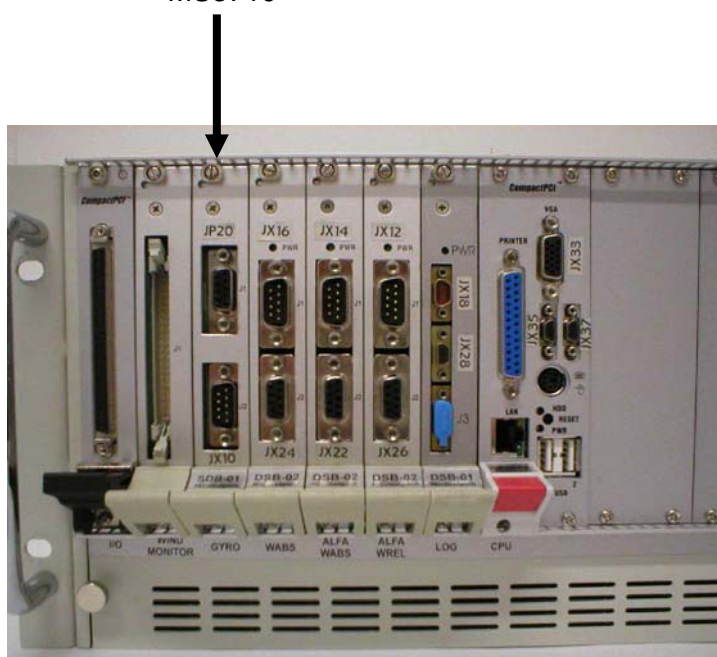
CHARACTERISTIC	VALUE
Processor	Pentium MMX 266 MHz
RAM	64 MB
Compact Flash	128 MB
Chipset	Intel 430TX
L2 Cache	512 KB On-Board
Serial ports	2 RS232 serial ports, 2 USB ports
Parallel port	Configured as LPT1, LPT2, LPT3 or disabled.
Ethernet	Intel 82559 Fast Ethernet Controller Chip 10/100 Base-TX (RJ45)
Keyboard / mouse	6-pin miniDIN connector on the front plate
PCI-to-PCI Bridge	DEC 21150 controller chip (up to seven master peripherals)
SVGA	Controller Intel C&T 69000, on-chip 2 MB SDRAM, up to 1280X1024 display resolution
Dimensions	160x100mm (3U), 2-slot (8TE)
Power supply	+5V (4.75V / 5.25V) @ 2.30A (typ)
Operating temperature	0 / +60°C
Storage temperature	-20°C / +85°C
Humidity	5 - 95 % (not condensing, operating and storage)
Weight	0.8 Kg
Shock	20g (operating); 50g (storage)
Random Vibration	1.5 Grms

MS3710 Synchro-to-Digital boards

The Synchro-to-Digital boards of the MS3710 series allow the conversion of a synchro input to a 16-bit digital word. The following Table illustrates the most important technical characteristics of the boards:

CHARACTERISTIC	VALUE
Supply voltages	+5V / 300mA, +12V / 40mA, -12V / 30mA, 3.3V / 20mA
Input	MS3710: 90 V _{L-L} , 60Hz MS3711: 90 V _{L-L} , 400Hz
Converter	AD2S83IP R-to-D converter with solid-state Scott transformer
Resolution	14bit
Accuracy	8 arc min
N. of channels	1
Temperature	Operating 0°C /+60°C, Storage -20°C /+85°C
Reference isolation	1000V
Signal isolation	1000V

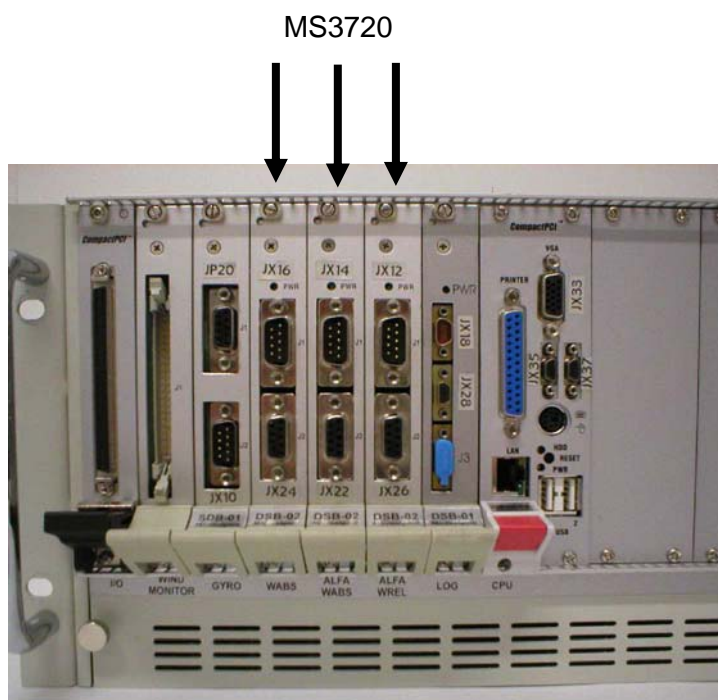
MS3710



MS3720 digital-to-synchro board

The series MS3720 digital-to-synchro board allows the conversion of a 16 bit digital word to a synchro signal. The following Table illustrates the most important technical characteristics of the board:

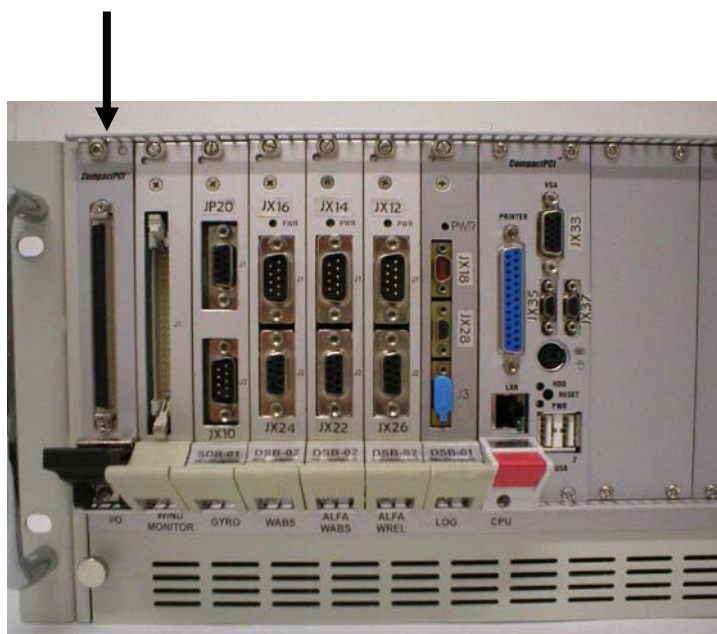
CHARACTERISTIC	VALUE
Supply voltages	+12V / 500mA, +5V / 50mA, 3.3V / 20mA
Input	Serial RS485
Output	90 V _{L-L} , 60Hz or 400Hz synchro signal
Output load	3VA
Output short-circuit	Continuous
Resolution	16bit
Accuracy	Better than 1 arcmin
N. of channels	1
Temperature	Operating 0°C /+60°C, Storage -20°C /+85°C
Signal isolation	1500V
Reference isolation	1500V



MS3740 I/O Board

The MS3740 I/O board is a flexible and powerful analog and digital I/O board. The technical characteristics are shown in the following Table:

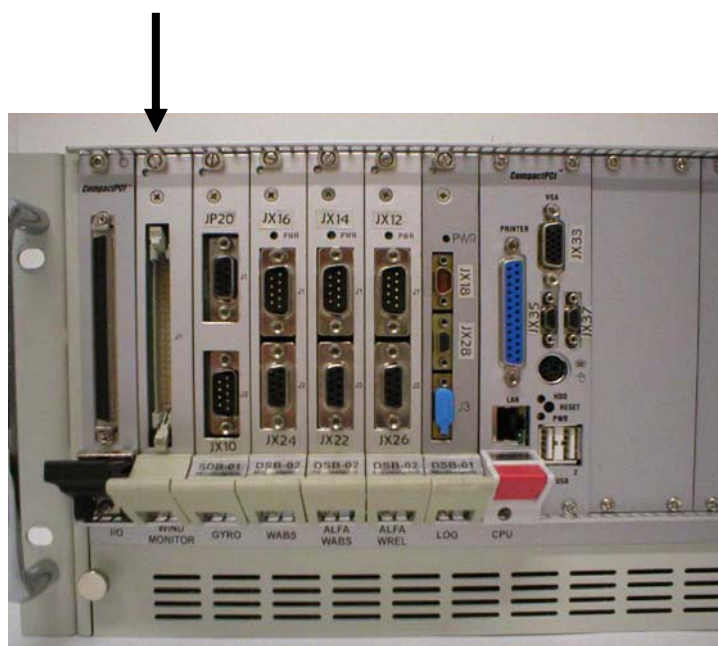
CHARACTERISTIC	VALUE
Bus	32-bit CompactPCI
Analog input	16 single-ended or 8 differential, on-board A/D FIFO, integrated DC/DC converter for the generation of the analog voltages, three A/D trigger modes (software, programmable pacer, external), up to 110KHz sampling rate
Analog input resolution	12 bit
Analog output	two 12-bit monolithic output channels
Digital input	16 digital TTL/DTL
Digital output	16 digital
Counters	3 16-bit programmable independent down-counter
Temperature	Operating 0°/+60°C, storage -20°/+85°C
Connector	100-pin SCSI-type



MS3760 Anemometer interface board

The MS3760 interface board allows the system to interface up to 2 Anemometers, model MS1104. The most important technical characteristics of the board are shown in the following Table:

CHARACTERISTIC	VALUE
Supply voltage	12V / 200mA
MS1104 potentiometer power supply	on-board generated, precision +10Vcc
Direction input	0° to 360°, buffered
Speed input	1 to 200 knots, buffered
Channels	2
Temperature	Operating 0°C /+60°C, Storage -20°C /+85°C



MS3750 Serial boards

The MS3750 Serial Boards allow the conversion of the electrical levels of the CPU serial lines to the levels required by the external units. For example, the MS3751 board converts COM1 from RS232 to RS422 and COM2 from RS232 to optoisolated RS422. Many combinations are possible using other Microsigma boards.

The most important technical characteristics of the MS3751 board are shown in the following Table.

CHARACTERISTIC	VALUE
Supply voltage	+12V
COM1 conversion	RS232 / RS485
COM2 conversion	RS232 / optoisolated RS422
COM2 isolation	1600 Vrms (1 minute)
Temperature	Operating 0/+70 °C, storage -55/+150 °C

MS3780 Synchro Booster module

The MS3780 synchro booster module allows the conversion of a low power synchro signal into a current amplified synchro signal capable of driving loads up to 25VA. The output signal is isolated to protect the source against load's fluctuations. The most important technical characteristics of the module are shown in the following Table:

CHARACTERISTIC	VALUE
Supply voltage	+24V / 3A max
Input	Synchro 90V _{L-L} , 60Hz or 400Hz
Output power	25VA
Output isolation	1000 Vrms
Accuracy	+/- 5 arcmin
Form factor	double Eurocard
Temperature	Operating -20° / +60°C, Storage -40° / +85°C