

Condition Monitoring Unit CMU 1000

Description:

The CMU 1000 is an electronic evaluation unit for permanent online condition monitoring of machines and systems.

In order to achieve this, the device must be supplied with relevant data which is recorded by the sensors connected to it. This recorded data (processed or unprocessed) can be transferred by the CMU 1000 via different ports or as an analogue value to other devices and/or monitoring levels.

The CMU 1000 processes the application program stored in it continuously and cyclically like a PLC. The user creates this program simply and conveniently using the **CM Editor** developed for this purpose and then uploads it to the CMU 1000.

The **CM Editor** is part of the HYDAC PC software **CMWIN Version V03 or higher** and it provides the various tools and functions in accordance with IEC 61131 for designing, integrating and testing the user program using "drag and drop" operations.

For status indication and for displaying messages and values on the device itself, there is a back-lit LCD display and three different coloured LEDs.

The CMU 1000 is operated and data is input on site using a built-in keypad within the menu structure of the device.

The CMU 1000 is designed for use in machines in both the stationary and mobile sectors.

It is possible to connect easily to higher level control systems, monitoring systems and bus systems using the built-in interfaces or in combination with an additional coupling module.



Special features:

- 8 input channels for HSI or SMART sensors
- 8 input channels for analogue sensors
- 4 input channels for digital signals
- 2 output channels for analogue signals
- 4 relay switching outputs with change-over contacts
- USB slave port for PC connection
- USB master port for storing measured data on a standard memory stick
- Ethernet interface
- RS 232 port
- 2-line LCD display (2 x 16 characters) to display measured data and status and/or error messages
- 3 user-programmable, different coloured LEDs for status indication (red, yellow, green)
- Simple operation using navigation pad
- Creation of customised application program using PC software **CMWIN** supplied

CM Editor:

The CM Editor is part of the HYDAC PC software **CMWIN** Version 03 or higher and provides many different tools and functions for designing, integrating and testing the application programm.

An application program consists of many individual functions which can be linked together. During subsequent operation, the user program is processed as for a PLC, cyclically. The program is created according to IEC 61131 (the standard in PLC programming).

The screenshot shows the CMWIN CM Editor interface. The main workspace displays a ladder logic diagram with a 'Start' button and several 'Setzen Text' (Set Text) functions connected to 'Text' outputs. The left sidebar contains 'Function properties' for 'Input1' (Boolean input value) and a 'Function list' with various logic and display functions. The right sidebar shows 'Functions' with categories like Data sources, Calculations, Numerical operations, Conditions, Links, Boolean operations, and Result values/actions. The bottom status bar indicates 'Current platform: CMU 1000'.

This screenshot shows the 'File' menu with options: Display, Simulate, Transfer into device, Receive from device, Deleting in the device, and Online debugging. A context menu is also visible over the 'Start' button in the 'Linked functions' workspace, with options: Apply from file, Apply from device, Uninstall, Saving to a file..., and Display.

This screenshot shows the 'Device', 'Sensor constellation', 'Sensor configuration', and 'Extras' menu bar. A context menu is visible over a 'Text' output in the workspace, with options: Apply from file, Apply from device, Uninstall, Saving to a file..., and Display.

The 'Simulation' window displays a table with the following data:

Sources		Actions		
Name	Input value	Name	Value	Cycle
Engabe2	1	Aktion7	not triggered	
Input1	1	Aktion17	not triggered	
		Aktion18	not triggered	
		Aktion19	not triggered	

At the bottom, it shows 'Cycle: 0' and buttons for 'Perform cycle', 'start auto. cycle', and 'end auto. cycle'.

The 'CM Program - Programm CMU 1000-4_Eng.hecomp' window shows the following variable declarations:

```

Engabe2 Boolean input value(1;"Start 2"/0)
Input1 Boolean input value(1;"Start"/0)
Intervall1 Time sensor(1)
Pulse generation1 Pulse generation(Input1)
Pulsenerkennung1 Boolean generation(Engabe2)
    
```

Technical specifications:

Supply

Input voltage:	18.0 .. 35.0 V DC
Current consumption	max. 1.5 A (3.5 A when CSI-F-10 connected)

Reverse polarity protection: -30 V

Withstand voltage +40 V

Connection of sensors

Up to 8 sensors with HSI functionality or up to 8 SMART sensors* and in addition up to 8 analogue sensors and up to 4 digital sensors
 4 x digital / 2 x digital + 2 x frequency / 3 x digital + 1 x frequency

Analogue inputs

Channel I and J (Accuracy)	4 .. 20 mA	($\leq \pm 0.1$ % FS max.)
	0 .. 20 mA	($\leq \pm 0.1$ % FS max.)
	0.5 .. 4.5 V	($\leq \pm 0.1$ % FS max.)
	0 .. 10 V	($\leq \pm 0.1$ % FS max.)
Channel K and L (Accuracy)	4 .. 20 mA	($\leq \pm 0.1$ % FS max.)
	0 .. 20 mA	($\leq \pm 0.1$ % FS max.)
	0.5 .. 4.5 V	($\leq \pm 0.1$ % FS max.)
	0 .. 50 V	($\leq \pm 0.1$ % FS max.)
	-10 .. +10 V	($\leq \pm 0.2$ % FS max.) L only!
Channel M and N (Accuracy)	4 .. 20 mA	($\leq \pm 0.1$ % FS max.)
	0 .. 20 mA	($\leq \pm 0.1$ % FS max.)
	0.5 .. 4.5 V	($\leq \pm 0.1$ % FS max.)
Channel O and P (Accuracy)	4 .. 20 mA	($\leq \pm 0.1$ % FS max.)
	0 .. 20 mA	($\leq \pm 0.1$ % FS max.)
	0.5 .. 4.5 V	($\leq \pm 0.1$ % FS max.)
	-10 .. +10 V	($\leq \pm 0.2$ % FS max.) P only!

Digital Inputs

Quantity	4, of which 2 are for frequency measurement (Channel Q and R)
Trigger threshold	approx. 2 V
Dynamics	30 kHz

Measurement channels

Quantity	32 - A measurement channel can be a value of a connected sensor (also a subchannel of a SMART sensor) or a value derived (calculated) from sensor data.
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Analogue Outputs

Quantity	2
Type	individually selectable, current (4 .. 20 mA) or voltage (0 .. 10 V)

Digital Outputs

Quantity	4
Type:	Relay output, change-over contact
Switching capacity	30V DC / 1 A

Calculation Unit

Analogue value recording	12 Bit A/D-converter
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Interfaces

Keypad	- 4 arrow keys (up, down, right, left) - OK key - ESC key
Display (back-lit)	- Two-line LCD display (2 x 16 characters) - Additional indication of status information via 3 different coloured LEDs is possible
USB Mass Storage Device **	- USB 1.1 / USB 2.0 full speed Port for connecting a mass storage device (memory stick) - Female connection type "A".
Ethernet, supported protocols	- RJ 45 8/8 Ethernet interface - HTTP Server - OPC Client
Serial Interface 0 (UART 0)	- Implementing an RS 232 or an HSI master interface - Change-over user-programmable (optional IO-Link also possible) - Connection via plug-in terminals - No handshake lines
HSI Master	Cascading the CMU
USB Device	- USB 1.1 / USB 2.0 full speed Port for connecting a PC / Notebook to configure the CMU - Female connection type "B".
CAN Bus Interface	Can be integrated as an option
IO Link Interface	Can be integrated as an option

Cycle Time

Independently determined at start of program
 Display of actual cycle time is possible in the CM Editor

Operating and Ambient Conditions

Operating temperature	-20 .. +70 °C
Storage temperature	-30 .. +80 °C
Relative humidity	0 .. 70 %, non-condensing

Dimensions and Weight

Dimensions	approx. 212 x 106 x 36 mm
Weight	approx. 600 g

Technical Standards

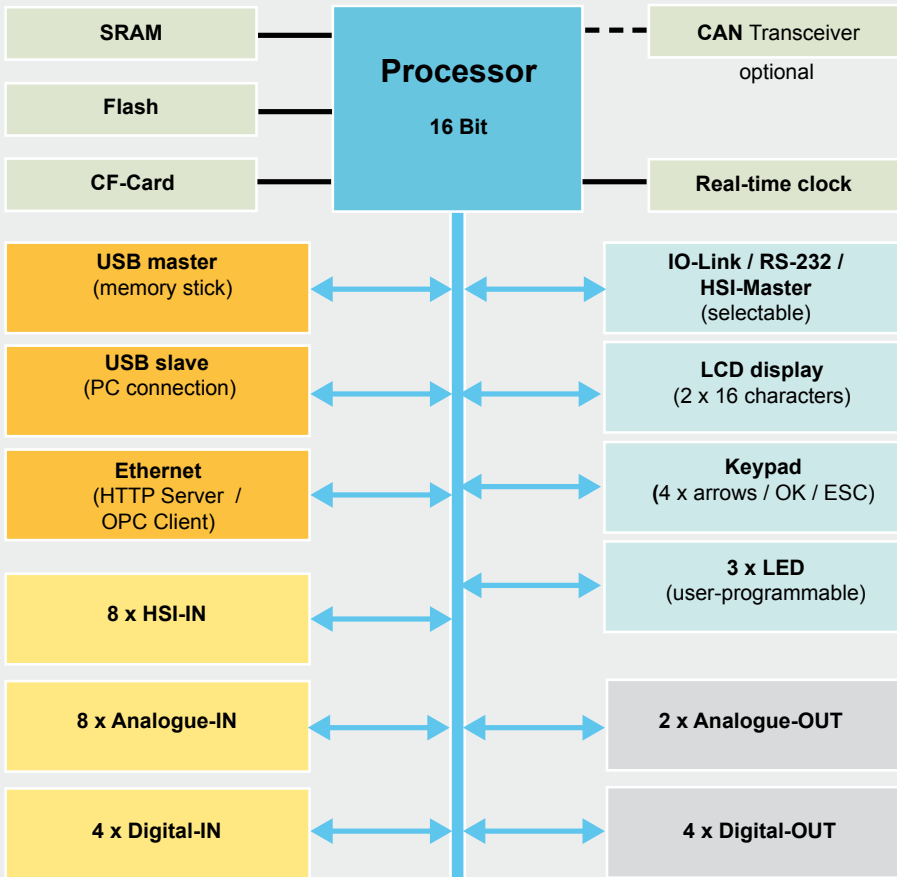
EMC	EN 61000-6-1 / 2 / 3 / 4
Safety	EN 61010
Protection class	IP 40

Note:

* SMART sensors (Condition Monitoring Sensors) are a generation of sensors from HYDAC, which can provide a variety of different measured values.

**Recorded data from the CMU can be transferred to a memory stick via this interface.
 The USB Host supports mass storage devices exclusively.

Block circuit diagram



Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

Model code:

CMU 1000 - 000 - X

Modification number _____

000 = Standard

Operating manual and documentation _____

D = German
E = English
F = French

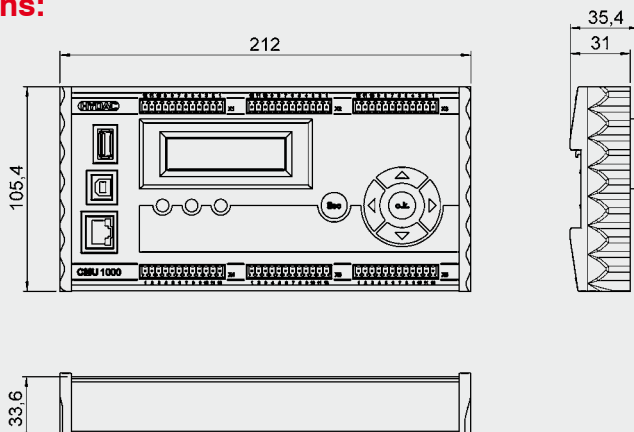
Note:

On units with a different modification number, please read the label or the technical amendment details supplied with the unit.

Accessories:

Appropriate accessories, such as sensor lines for the electrical connection, can be found in the Accessories section.

Dimensions:



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