

Condition Monitoring Unit CMU 1000

Description:

The CMU1000 is an electronic evaluation unit designed 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 on a PC 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** (supplied) 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, monitoring 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 USB memory stick
- Ethernet interface
- RS 232 interface
- 2-line LCD display (2 x 16 characters) to display measured data and status and/or error messages
- 3 user-programmable LEDs in different colours, for status indication (red, yellow, green)
- Simple operation using navigation pad
- Creation of customised application program using the PC software **CMWIN** supplied

CM Editor:

The CM Editor is part of the HYDAC PC software **CMWIN**, Version 03 or higher, and provides a wide variety of tools and functions for designing, integrating and testing the application program. An application program consists of many individual functions which can be linked together. During subsequent operation, this user program is processed as for a PLC, cyclically. The program is created according to the IEC 61131 (the standard for PLC programming).

The screenshot shows the CM Editor interface with the following components:

- Function properties (Left Panel):**
 - Input1:** Boolean input value.
 - Function:** Boolean input value.
 - Specific properties:** X-Position: 25, Y-Position: 6, Starting value: On, Functionality: Switch.
 - Comment:** (Empty)
 - Function list:** A table listing various functions like And, Display message, Boolean input value, etc.
- Linked functions (Main Area):** A ladder logic diagram with a 'Start' button, several 'Setzen Text' (RS) blocks, and 'Text' display blocks (Text 1 through Text 1o).
- Functions (Right Panel):** A palette containing various function blocks categorized into Data sources, Calculations, Numerical operations, Conditions, Links, Boolean operations, and Result values/actions.

The File menu is open, showing the following options:

- Display
- Simulate
- Transfer into device
- Receive from device
- Deleting in the device
- Online debugging

The Device menu is open, showing the following options:

- Apply from file
- Apply from device
- Uninstall
- Saving to a file...
- Display

The Simulation window shows the following data:

Sources		Actions		
Name	Input value	Name	Value	Cycle
Eingabe2	1	Aktion1	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 autom. cycle', 'end autom. cycle', and 'Close'.

The CMWIN window title is 'CMWIN' and the program name is 'CM Program - Programm CMU 1000-4_Eng.hecmp'. The variable list includes:

- Eingabe2: Boolean input value(1;"Start 2";0)
- Input1: Boolean input value(1;"Start";0)
- Intervall1: Time sensor(1)
- Pulse generation1: Pulse generation(Input1)
- Flankenerkennung?: Pulse generation(Eingabe2)

Technical data:

Supply

Input voltage 18.0 .. 35.0 V DC

Current consumption max. 1.5 A (3.5 A when CSI-F-10 connected)

Reverse pol. protect.: -30 V

Isolation voltage +40 V

Connection of sensors

Up to 8 sensors with HSI functionality or up to 8 SMART sensors¹⁾ 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.

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

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 Device²⁾ - 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
- TCP/IP

Serial Interface 0 (UART 0) - Implementing an RS 232 or an HSI master interface
- Change-over user-programmable
- 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

Cycle time

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

Operating and environmental 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

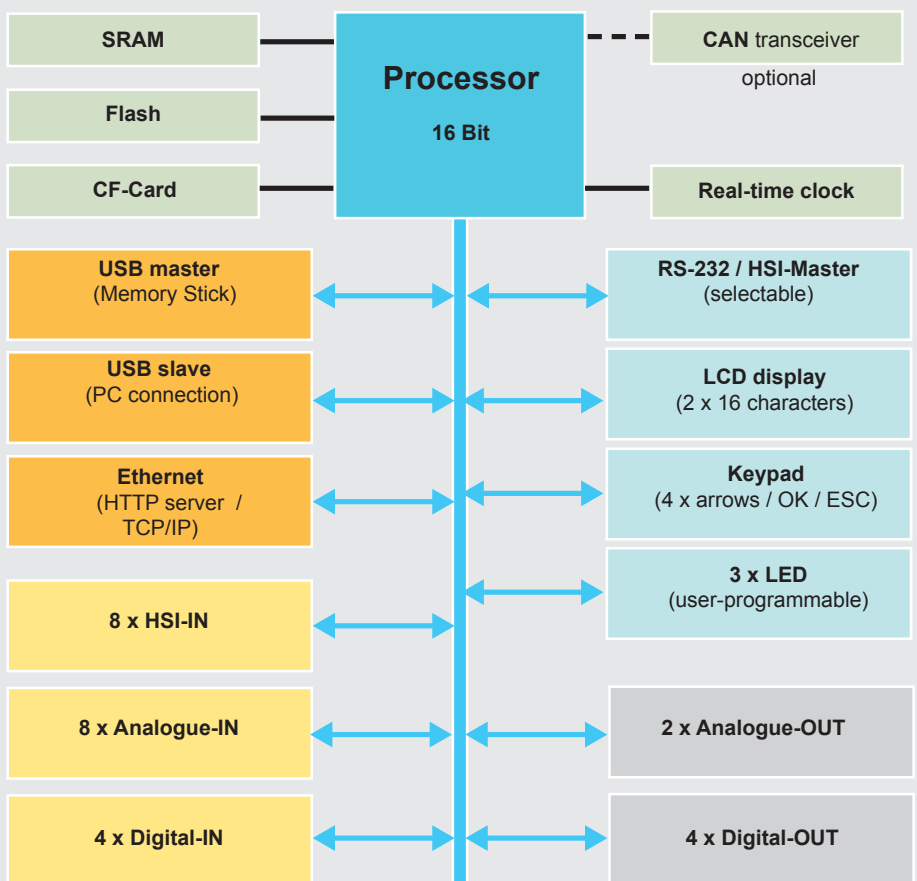
Protection class IP 40

Note:

¹⁾ SMART sensors (Condition Monitoring Sensors) are a generation of sensors from HYDAC, which can provide a variety of different measured values.

²⁾ 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 and 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

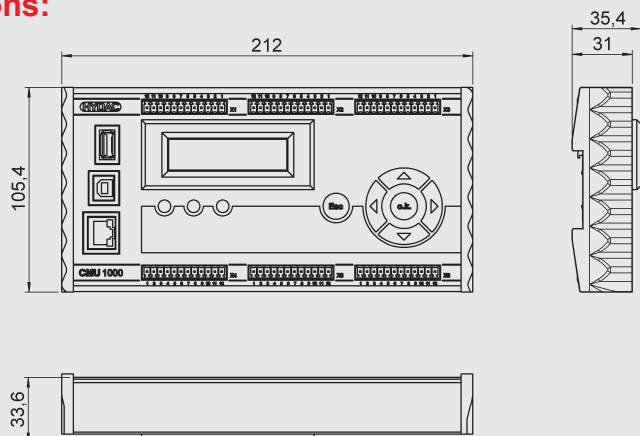
Note:

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

Accessories:

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

Dimensions:



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