



## Modbus Interface

## OCI412.10

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**Interface between an LMV2... / LMV3... burner control and a modbus system, such as a building automation and control system (BACS). The modbus interface is based on the RS-485 standard.**

**The OCI412.10 and this Data Sheet are intended for use by OEMs which integrate the interface in their products!**

### Use

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The OCI412.10 is a microprocessor-based interface with galvanic separation used for connecting an LMV2... / LMV3... burner control to a modbus system. In such a system, the LMV2... / LMV3... operates as a modbus slave. The OCI412.10 is designed for stationary use under the burner hood or in a control pane, always in connection with the LMV2... / LMV3...

It offers:

- Visualization of plant states
- Control of plant
- Logging

## Warning notes



To avoid injury to persons, damage to property or the environment, the following warning notes must be observed!

**Do not open, interfere with or modify the unit. Siemens will not assume responsibility for damage resulting from unauthorized interference!**

- All activities (mounting, installation and service work, etc.) must be performed by qualified staff
- Before making any wiring changes in the connection area, completely isolate the plant from mains supply (all-polar disconnection). Ensure that the plant cannot be inadvertently switched on again and that it is indeed dead. If not observed, there is a risk of electric shock hazard
- Ensure protection against electric shock hazard by providing adequate protection for the connection terminals
- After each activity (mounting, installation and service work, etc.), check to ensure that wiring is in an orderly state and that the parameters have been correctly set
- Fall or shock can adversely affect the safety functions. Such units must not be put into operation even if they do not exhibit any damage
- The unit is approved for stationary use only
- The safety, warning and technical notes given in the Basic Documentation on the LMV27.100... system (P7541) also apply to this Data Sheet

## Mounting notes

- Ensure that the relevant national safety regulations are complied with
- The interface is designed for fitting to DIN mounting rails (as per EN 50 022)
- **Degree of protection IP40 as per DIN EN 60 529 must be ensured by the burner or boiler manufacturer through adequate installation of the OCI412.10 (e.g. installation under the burner hood or in the control panel)**
- Ensure strain relief of the connected cables in compliance with the standards (e.g. DIN EN 60 730 and DIN EN 60 335)
- Ensure that spliced individual wires cannot touch neighboring terminals. Use adequate ferrules
- When making the wiring, protective extra low-voltage (safe separation from mains voltage) must be strictly segregated from extra low-voltage to ensure protection against electric shock hazard
- The connecting cables for the OCI412.10 may only be removed or exchanged when the plant is shut down (all-polar disconnection), since the COM port of the LMV2... / LMV3... does not provide safe separation from mains voltage
- The connecting cable between the LMV2... / LMV3... and the OCI412.10 must be suited for use under the burner hood or in control panels
- Cables must first be plugged into the socket for X10 or X20 and then into the OCI412.10 interface



- Cable the plug for connection X20, before you put the plug into the OCI412.10 (danger of contact break)

## Installation notes

- The housing of the OCI412.10 is designed for fitting to an M36-DIN mounting rail (as per EN 50022, 35 mm corresponding to 2 modular units)

## Disposal notes



The unit contains electrical and electronic components and must not be disposed of together with household waste.  
Local and currently valid legislation must be observed.

## Technical data

General unit data	Operating voltage X20	AC 24 V $\pm$ 10 % (PELV) DC 24 V $\pm$ 20 % (PELV)
	Power consumption	<2 W (typically)
	Safety class	II
	Degree of protection	IP30 (not when installed) Note: Degree of protection IP40 must be ensured by the burner or boiler manufacturer through adequate installation of OCI412.10
	Fusing	Internal self-resetting fuse 125 mA (Poly switch)

Cable lengths	• X10 (LMV2... / LMV3...)	Max. 3 m (100 pF/m) For use under the burner hood or in a control panel
	• X20 (Modbus)	Max. 100 m (100 pF/m)

Cable requirements Cable insulation must be suited for the respective environmental conditions!

- Connector X10 (Molex / Combicon) 5 pins / RM 5.08 mm
- Connector X20 (Molex / Combicon) 5 pins / RM 5.08 mm

### Connecting cable

Connecting cable to burner controls LMV2... / LMV3...



- Included in delivery
- Length Ca. 0.3 m
- Connection on OCI412.10 X10
- Connection on LMV2... / LMV3... X92 COM

### Environmental conditions

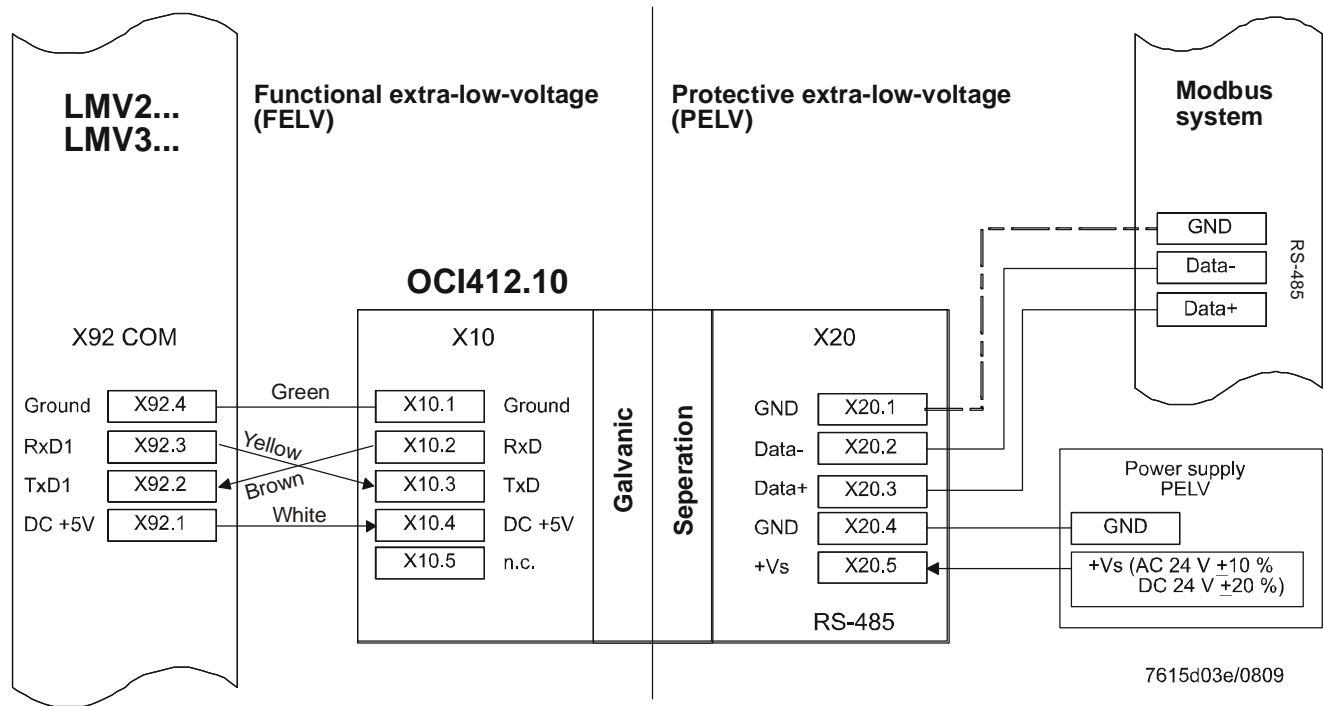
<b>Storage</b>	DIN EN 60721-3-1
Climatic conditions	Class 1K3
Mechanical conditions	Class 1M2
Temperature range	-20...+60 °C
Humidity	<95 % r.h.
<b>Transport</b>	DIN EN 60721-3-2
Climatic conditions	Class 2K2
Mechanical conditions	Class 2M2
Temperature range	-20...+60 °C
Humidity	<95 % r.h.
<b>Operation</b>	DIN EN 60721-3-3
Climatic conditions	Class 3K3
Mechanical conditions	Class 3M3
Temperature range	-20...+60 °C
Humidity	<95 % r.h.



#### Attention!

**Condensation, formation of ice and ingress of water are not permitted!  
If this is not observed, there is a risk of loss of safety functions and a risk of electric shock.**

## Connection diagram



### Example: Connection table for X20 (RS-485) to D-SUB 9 (RS-485) or Simatic Modbus / USS modules

OCI412.10 connection X20	General description	D-SUB 9 plug (RS-485)	Simatic ET200s 1SI Modbus / USS modules 6ES7138-4DF01-0AB0 6ES7138-4DF11-0AB0
X20 Pin 1	GND (Data)	Pin 5	Pin 8
X20 Pin 2	Data-	Pin 8	Pin 1
X20 Pin 3	Data+	Pin 3	Pin 2
X20 Pin 4	GND (power supply, PELV)		
X20 Pin 5	+Vs (AC 24 V ±10% DC 24 V ±20%)		

## Operating elements

### Switch OCI412.10

Switch no.	Alternative designation	Function (switch position ON)	As supplied
1	R1 <sup>1)</sup>	RS-485, bus terminator 120 $\Omega$ (between Data+ and Data-)	OFF
2	R2 <sup>1)</sup>	RS-485, 820 R-resistor against 5 V (Data+ against 5 V)	OFF
3	R3 <sup>1)</sup>	RS-485, 820 R-resistor against GND (Data- against GND)	OFF
4	S1	Reserved	OFF
5	S2	Reserved	OFF
6	S3	Reserved	OFF
7	S4	Reserved	OFF
8	S5	Reserved	OFF

#### <sup>1)</sup> Terminators

The terminators can be switched via switches no. 1 through 3 and are of importance only when the interface is installed at the end of the RS-485 line. The 120  $\Omega$  resistor (switch no. 1) serves as a bus terminator. In principle, a terminator must be fitted at both ends of the line. Its resistance must correspond to the characteristic impedance of the line. The resistance of the OCI412.10 corresponds to that of a typical RS-485 application. If not sufficient, an additional adequate resistor must be fitted. The characteristic impedance depends on the type of cable. In bus mode, terminators must not be connected to RS-485 modules located somewhere else on the line. The pull up and pull down resistors (switches no. 2 and 3) of 820  $\Omega$  each generate a defined level, when all users on the line are switched to reception (high-impedance).

#### Indication of operating states via LEDs

LED color	Description
Red, flashing fast	Internal error OCI412.10
Orange, steady	Standby (X10.4, without voltage)
Green, steady	Standby (LMV2... / LMV3..., connected and ready to operate)
Green, flashing	Communication Modbus

## Dimensions

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Dimensions in mm

OCI412.10

