



### Descrizione

MD2020-CU è l'unità di controllo del Sistema di Rilevamento Incendio per rivelatori e dispositivi di tipo indirizzabile realizzata in conformità alle normative EN54-2 in grado di gestire configurazioni Loop o Branch

- La prima, impianti di tipo "Centralizzato" (Unica Centrale) o di tipo "Distribuito" (Più Centrali collegate in rete) che prevedono i rivelatori collegati su linee chiuse (**Loop**) collegate sulla Centrale.
- La seconda, per la gestione di impianti di tipo "Distribuito" che prevedono i rivelatori collegati su linee elettriche aperte denominate **Branch** collegate tra due Centrali in accordo alla normativa "Safe Return to Port".

Le principali caratteristiche di questo apparato sono:

- ❑ Controllata da processore.
- ❑ Connette fino a 20 **Loops** mediante altrettanti Moduli di Controllo **MD2020-LCU**.
- ❑ Connette fino a 40 **Branch** mediante altrettanti Moduli di Controllo **MD2020-BCU**.

Il numero di **Branch** può essere esteso fino a 80 mediante il Nodo Remoto **MD2020-RM**.

- ❑ Protocollo di comunicazione MD2 tra schede **LCU/BCU** e dispositivi indirizzabili.
- ❑ Fino a **50** centrali possono essere interconnesse tra loro.
- ❑ Fino a **127** dispositivi collegabili su ogni **Loop**.
- ❑ Fino a **180** dispositivi collegabili su ogni **Branch**.
- ❑ La Centrale segnala ogni anomalia del sistema di rilevamento (loop/branch interrotto, sensore degradato, etc.)
- ❑ La Centrale è in grado di gestire il controllo del **Branch** con un'altra Centrale

### Description

MD2020-CU is the Control Unit of the Fire Detection System for addressable detectors and devices, developed according to the standards EN54-2 suitable to work in two configurations:

- The first one, for Centralized Systems (one Central Unit) or Distributed Systems (several Central Units interconnected), where the detectors are connected on rings (**Loop**) connected to the Control Unit.
- The second one, for Distributed Systems, is suitable to manage detectors connected on lines named **Branch** connected between two Stations according to the "Safe Return to Port" rule.

The main features of the equipment are:

- ❑ Controlled by a processor
- ❑ Connects up to 20 Loops using an equal number of **MD2020-LCU** Control Modules.
- ❑ Connects up to 40 **Branch** using an equal number of **MD2020-BCU** Control Modules.

The **Branch** can be increased up to 80, by using the Remote Node **MD2020-RM**.

- ❑ Communication bus between **LCU/BCU** cards and addressable units, based on MD2 protocol.
- ❑ Up to 50 control units can be interconnected with each other.
- ❑ Up to **127** devices connected to each **Loop**.
- ❑ Up to **180** devices connected to each **Branch**.
- ❑ The Central Unit can detect any fault occurring on the detection system (loop/branch break, detector failure, etc.).
- ❑ The Control Unit is capable of managing branch control with another Station.

## Descrizione

La Centrale gestisce anche le seguenti funzioni:

- ❑ 5 uscite a contatti liberi da potenziale (NO/NC) con funzione standard (EN54-2)
- ❑ 2 uscite monitorate a 24 VDC per segnalazioni acustiche esterne di ALLARME e FAILURE
- ❑ 4 uscite mediante contatti di relè (NO/NC) con funzione programmabile.
- ❑ 14 uscite statiche con funzione programmabile adatte a pilotare relè di interfaccia (NO/NC)
- ❑ 2 ingressi digitali isolati e monitorati con funzione programmabile.
- ❑ 2 ingressi digitali non isolati con funzione programmabile.
- ❑ 1 ingresso per termoresistenza esterna con funzione programmabile
- ❑ 1 porta di comunicazione Ethernet per la connessione in rete con le altre centrali e la condivisione totale dei dati e della operatività
- ❑ 1 porta di comunicazione Ethernet per la connessione a ripetitori o sistemi di supervisione esterni
- ❑ 1 porta seriale RS485 full duplex per la connessione a VDR (Voyage Data Recorder)
- ❑ 1 porta seriale RS485 full duplex per la connessione a BAM (Bridge Alert Management)
- ❑ 1 porta seriale RS232 per la connessione a stampante locale.
- ❑ Nella configurazione **Loop**, il DMO (Degraded Mode Operation) assicura il funzionamento anche in caso di "SYSTEM HALT" (blocco del microprocessore principale) o in caso di mancanza di comunicazione tra **LCU** e la Centrale.  
Il sistema può così segnalare l'occorrenza di un allarme sul Loop and permette il suo riconoscimento ed il reset.
- ❑ La Centrale include un circuito **IMD** (Insulation Monitoring Device) in grado di rilevare una perdita di isolamento della linea di alimentazione verso terra (ground) e di segnalare il guasto

## Description

The Central Unit provides the following additional functions:

- ❑ 5 outputs (dry NO/NC contacts) with standard functions (EN54-2)
- ❑ 2 monitored 24 VDC powered outputs for external acoustic signaling for ALARM and FAILURE
- ❑ 4 outputs (dry NO/NC contacts) with programmable functions.
- ❑ 14 static outputs with programmable function suitable for driving interface relays (NO/NC).
- ❑ 2 isolated and monitored digital inputs with programmable functions
- ❑ 2 non-isolated digital inputs with programmable function
- ❑ 1 input for external thermistor with programmable function
- ❑ 1 Ethernet communication port for network connection with other control units and total data and operational sharing
- ❑ 1 Ethernet communication port for connection to repeater or external supervisory systems
- ❑ 1 full duplex RS485 serial port for connection to VDR (Voyage Data Recorder)
- ❑ 1 full duplex RS485 serial port for connection to BAM (Bridge Alert Management)
- ❑ 1 RS232 serial port for connection to local printer
- ❑ In the **Loop** configuration the "Degraded Mode Operation" DMO ensures operation even in case of "SYSTEM HALT" (block of the main microprocessor) or in case of missing communication between the **LCU** and Control Unit.  
The system can still signal the occurrence of one alarm on the **Loop** and allows its to acknowledge and reset.
- ❑ The control panel includes an **IMD** (Insulation Monitoring Device) circuit capable of detecting a loss of insulation of the power supply line to ground and reporting the fault

Lo schema a blocchi in figura 1 mostra i moduli funzionali facenti parte della Centrale **MD2020-CU**.

The block diagram in figure 1 shows the functional modules that are part of the **MD2020-CU** Control Unit,

- *Interfaccia operatore composta da Tastiera e Display con Touch Panel*
- *Scheda **SVB** (Service Board) che include:*
  - *Modulo microprocessore (SOM)*
  - *Modulo di funzionamento degradato (DMO)*
  - *Modulo di alimentazione principale*
  - *Modulo di monitoraggio isolamento IMD*
  - *Modulo di alimentazione DMO*
  - *Interfaccia seriali*
  - *Interfaccia Input/Output (CTB)*
- *Operator interface consisting of Keypad and Display with Touch Panel*
- ***SVB** (Service Board) which includes:*
  - *Microprocessor module (SOM)*
  - *Degraded Mode Operation module (DMO)*
  - *Main Power Supply module*
  - *Insulation Monitoring Device (IMD)*
  - *DMO Power module*
  - *Serial interface*
  - *Input/Output interface (CTB)*

## Schema a blocchi

## Block Diagram

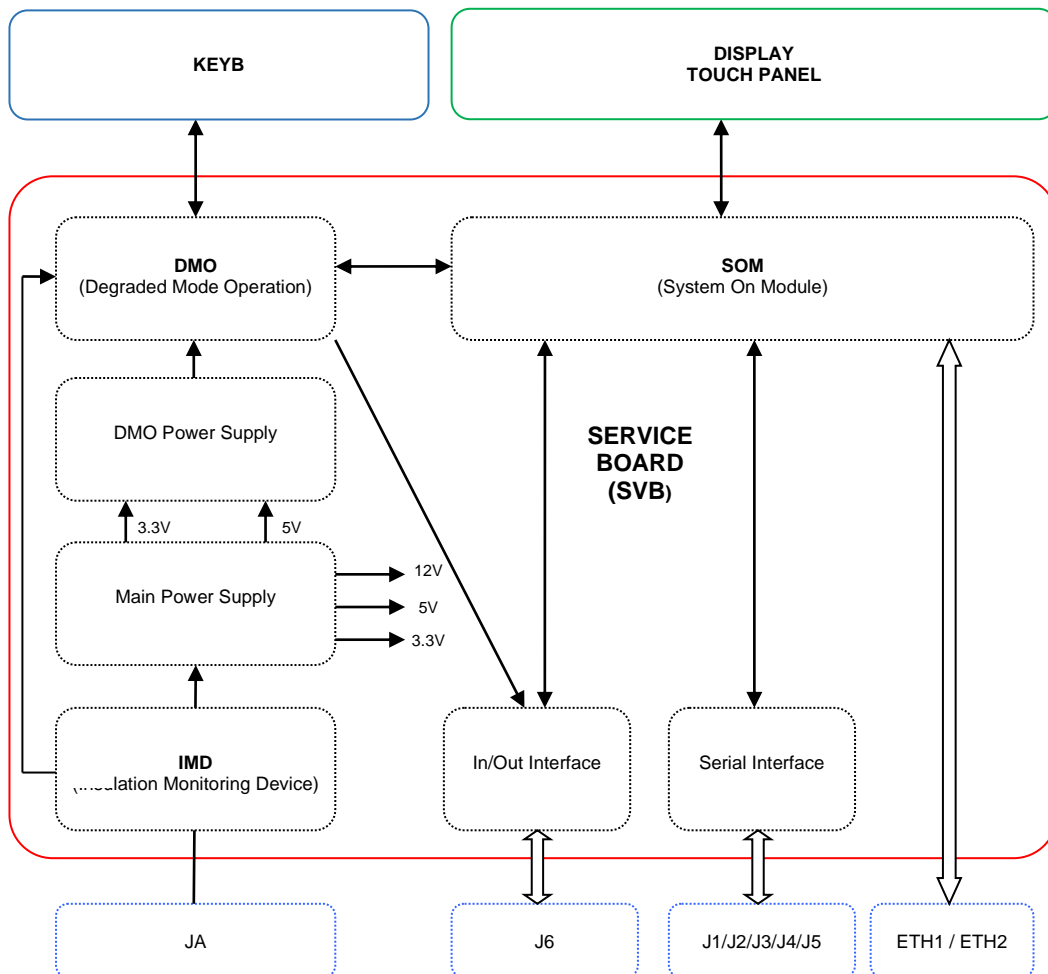


Fig. 1 - MD2020 Block Diagram

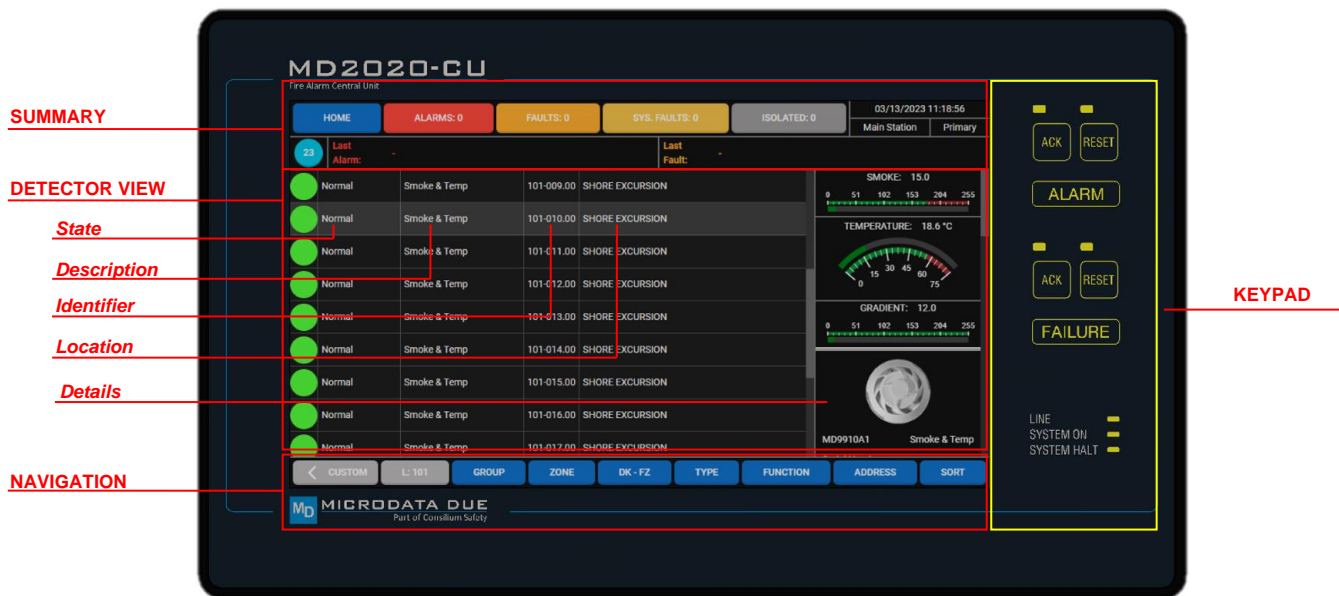


Fig. 2 - Display layout

## Interfaccia operatore

La Centrale MD2020-CU dispone di:

- Display LCD a colori 10,1" 1200x600 con touch screen
- Tastiera con segnalazioni a LED separate per riconoscimento e reset di Allarmi ed Avarie
- Accesso attraverso l'interfaccia HMI a diversi livelli di menu, protetti da password:
  - Filtraggio dei dati visualizzati
  - Operazioni di isolamento/ripristino dispositivi
  - Memoria eventi
  - Diagnostica
  - Test lampade e buzzer
  - Simulazione di allarme/avaria
  - Impostazioni (Ora, luminosità, volume)
  - Funzione di scorrimento messaggi
  - Indirizzamento dispositivi

La visualizzazione sul HMI prevede quattro sezioni:

- Area Cumulativa: con indicazioni relative allo stato del sistema indicante Allarmi, Avarie, Isolati, Cautele.
- Area Vista Rilevatori: con visualizzazione dei messaggi (secondo il filtro impostato). In automatico il filtro è Allarme/Avaria.

Include una finestra con i dettagli dell'oggetto selezionato (in particolare, per i rivelatori di

## User Interface

MD2020-CU Central Unit includes:

- LCD display 10,1" 1200x600 with integrated touch screen
- Keyboard with separate LED indications for recognition and reset of alarms and faults
- Access via the HMI interface to different menu levels, protected by password:
  - Filtering the displayed data
  - Device Isolation/Recovery operations
  - Event log
  - Diagnostics
  - Test Lamp & Buzzer
  - Alarm / Failure simulation
  - Settings (Time, Brightness, Volume)
  - Message scrolling function
  - Device addressing

The visualization on the HMI consists of four sections

- Summary Area: with indications relating to the status of the system indicating Alarms, Failures, Isolated, Cautions.
- Detector Viewing Area: displaying messages (according to the set filter). By default, the filter is Alarm/Fault.

Includes a window with details of the selected object (particularly for Smoke/Heat detectors, graphical

Fumo/Calore, rappresentazione grafica dei valori analogici di fumo, temperatura, gradiente)

representation of analogue values of smoke, temperature, gradient).

Per ogni oggetto selezionato è possibile aprire la scheda tecnica

For each selected object, it is possible to open the technical datasheet

- Area Navigazione include i tasti soft per accedere dinamicamente ai vari sottomenu
- Area Tastiera include 4 pulsanti per il riconoscimento ed il reset degli Allarmi e delle Avarie e le indicazioni luminose
- Navigation Area includes soft keys to access dynamically the various submenus
- Keypad Area includes 4 buttons for the Acknowledge and Reset of Alarm and Faults and the light indications

## Installazione

## Installation

MD2020-CU ... montaggio su pannello o su Rack 19" mediante adattatore 30522 in cabinet o quadro da parete

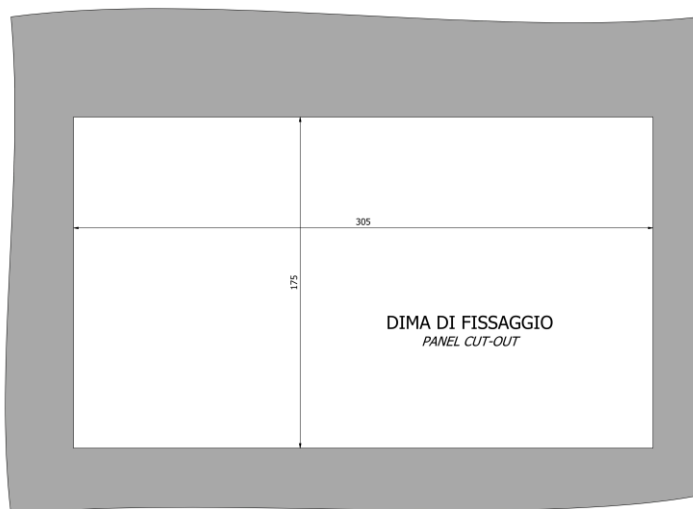
MD2020-CU.....panel or Rack mounting 19" 6UR by 30522 adapters in cabinet or wall-mounting box

Moduli.....montaggio su barra DIN-TS35 mediante accessorio di connessione T-BUS

Modules .....DIN-TS35 DIN rail mounting using T-BUS connection accessory.

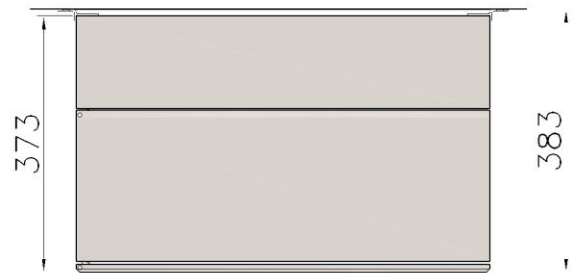
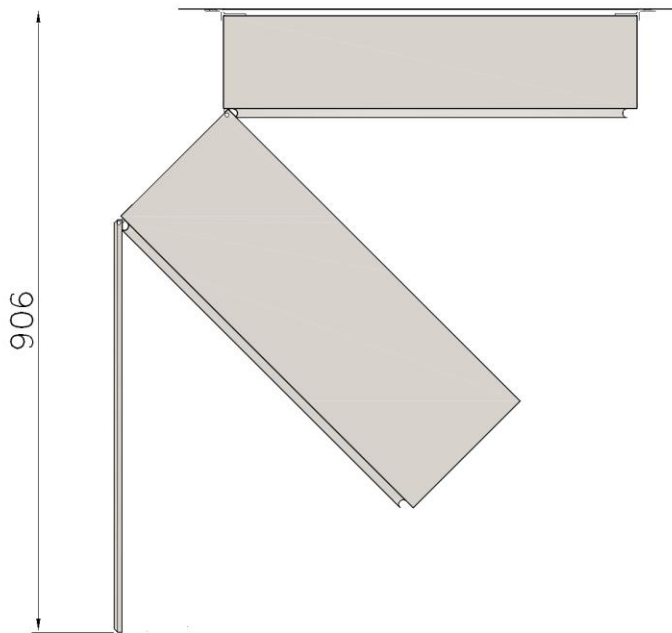
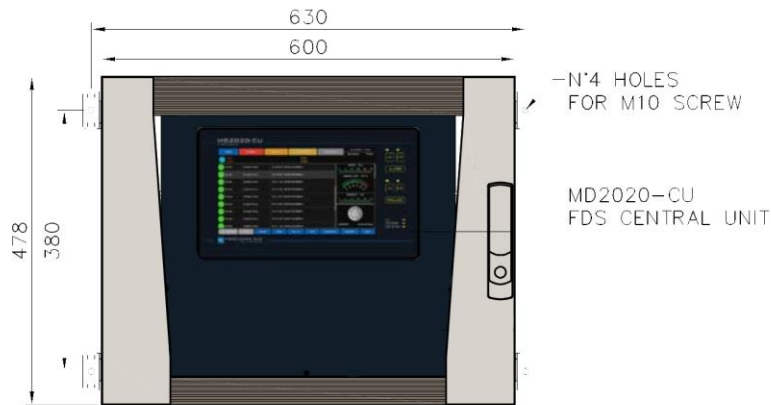
## Ingombri e dima di fissaggio

## Outline & Cut-Out



**Armadio 9UR**  
**Ingombri e dima di fissaggio**

**9UR Wall Mounting Box**  
**Outline & Cut-Out**

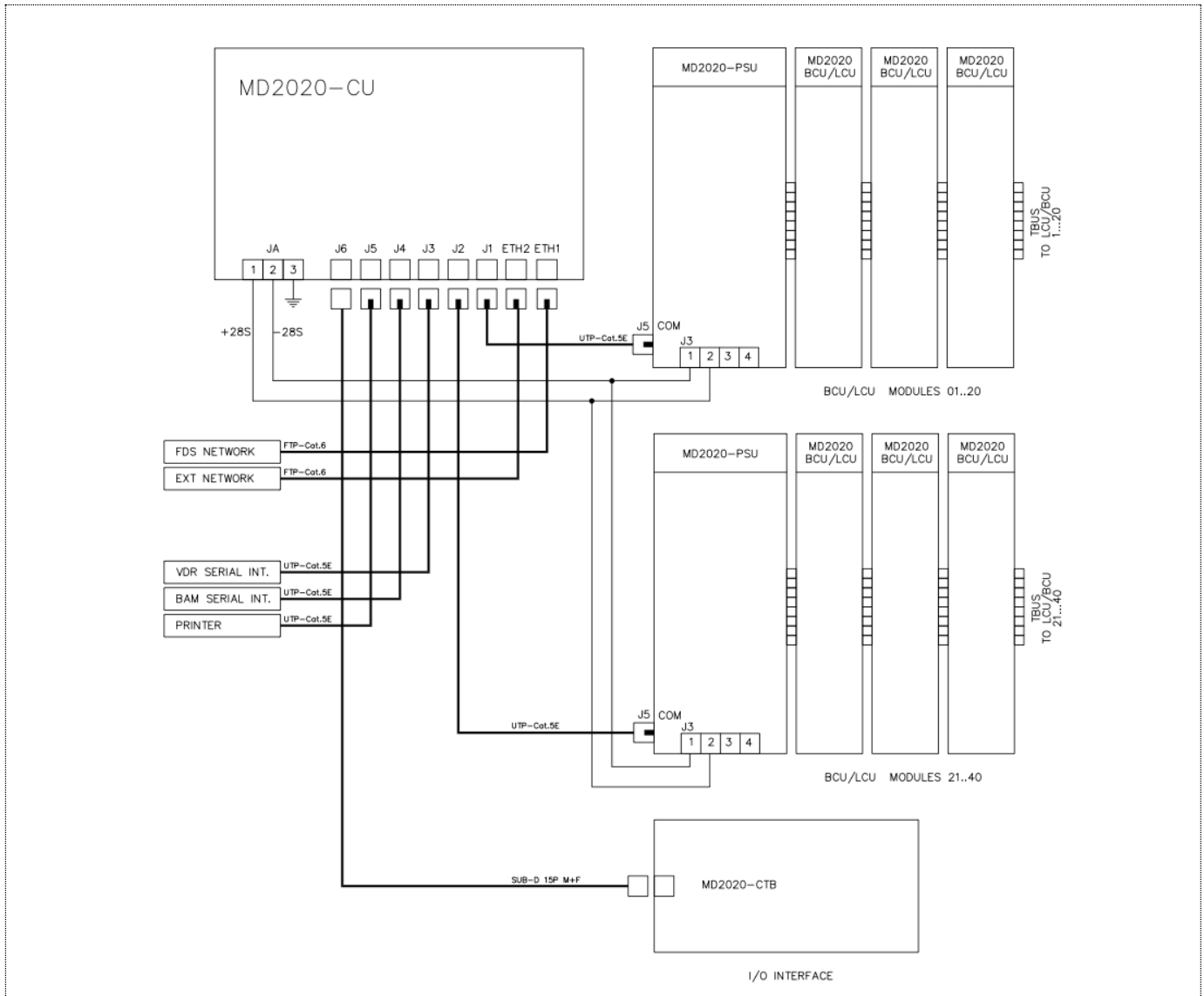


**Conessioni****Connections**

Sul retro della centrale MD2020 sono previsti i connettori:

On the back of the MD2020 central unit the following connectors are provided:

ETH1, ETH2	per il collegamento con le linee Ethernet ETH1 e ETH2 usare cavo FTP cat. 6	ETH1, ETH2	for connection to ETH1 and ETH2 Ethernet lines use cable FTP cat. 6
J1, J2	collegamento a MD2020-PSU usare cavo UTP cat. 5e	J1, J2	for connecting to MD2020-PSU module use cable UTP cat. 5e
J3, J4	collegamento delle porte seriali per interfacciare VDR e BAM usare cavo UTP cat. 5e	J3, J4	for connecting serial ports to interface VDR and BAM use cable UTP cat. 5e
J5	collegamento con la stampante usare cavo UTP cat. 5e	J5	for connection to the printer use cable UTP cat. 5e
J6	collegamento con l'interfaccia MD2020-CTB di Input / Output usare cavo SUB-D 15 M+F	J6	for connection to the MD2020-CTB Input/Output interface use cable SUB-D 15 M+F
JA	collegamento con la alimentazione usare cavo sez. max 1,5 mmq	JA	for connection to the power supply Use 1,5 sq sez. max mm cable (AWG 15)



**Documenti di Riferimento**

**Related Documents**

- Technical Specification ST-43415



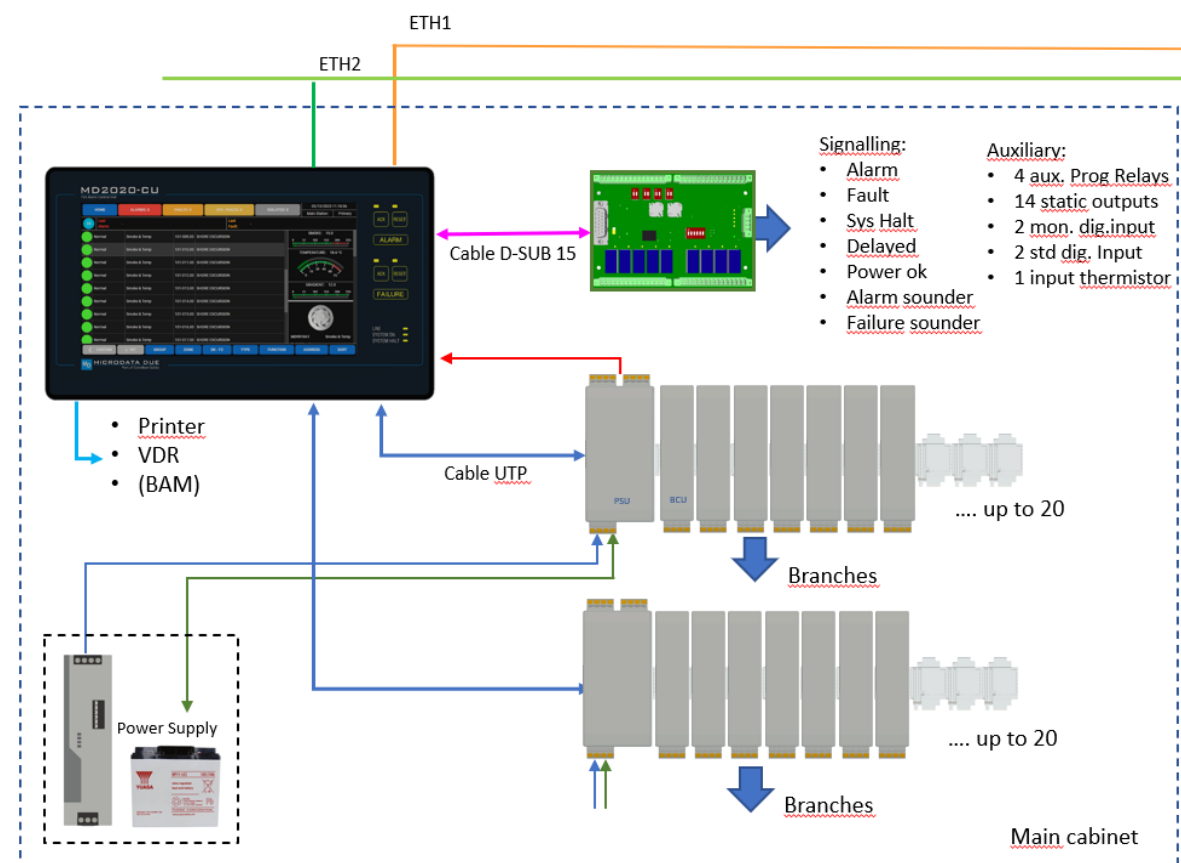
**Codici di ordinazione**

**Order Code**

Modello Model	Codice Part Number	Descrizione Description
MD2020-CU	30103	Centrale di Rilevamento Fire Alarm Central Unit
MD2020-RN	30513	Nodo remoto Remote Node
MD2020-PSU	30378	Alimentatore e carica batterie Power Supply and Battery Charger
MD2020-BCU	30287	Scheda Controllo Branch Branch Control Unit
MD2020-LCU	30284	Modulo Controllo Loop Loop Control Unit
CTB interface	30377	Interfaccia di ingresso / uscita Input / Output interface
RACK 19" adapter	30522	Adattatore per montaggio Rack 19" 19" Rack Mount Adapter

**Schema a Blocchi del Sistema**

**System Block Diagram**



## Technical specification

### General

Dimension	lpxh	323 x 193 x 59 mm
Material		Aluminium alloy black passivated
Weight	Kg	1,9 kg
IP Protection Grade		IP 54 front panel / IP20 rear panel
Operating Temp	Min÷Max	-5° ↔ +50°C
Storage Temp	Min÷Max	-25 ↔ +70 °C
Relative Humidity	Min÷Max	5% ↔ 95%
Climatic class		according to EN 60271-3-3 – class 3K5
Connectors		J1÷J5, ETH1, ETH2, - Type RJ45 J6 - D-SUB 15 JA - Header 3 poles
Shock and vibrations		According to EN54-2 and 60092-504
MTBF		TBD

### Electrical

Power Consumption (with output ports OFF)	Max	24 W
	Typical	17 W
Power Supply Voltage	Nom.	28V
	Min÷Max	16.8÷30VDC
	Absolute max	36 VDC
Inrush current	Typical	7 A
Grounding		Via power connector
Polarity reversal		Protected
Insulation monitoring (IMD)	Yes	Power line insulation to ground < 5 kohm

### User interface

Display	Yes	TFT colour display 1200x600 IPS 750 cd/m <sup>2</sup>
Display backlight	Yes	Adjustable from 20 to 100% (TBC)
Touch panel	Yes	Resistive
Pushbutton	4	Backlighted - Alarm ACK+RST and Failure ACK+RST
Status Led Indicators	1	Red bar for ALARM
	1	Yellow bar for FAILURE
	4	Yellow for ACK and RST status
	2	Green for Line & System On
	1	Yellow for System Halt
Keypad backlight	Yes	Adjustable from 0 to 100%
Buzzer	1	Adjustable from 10 to 100% (> 60dB@1m)

### Interface

Ethernet port	2	Dual Gigabit Ethernet RJ45 – isolated
Serial port	2	RS485 full duplex non-isolated – used for BCU / LCU communication
	2	RS485 full duplex isolated – used for VDR / BAM
	1	RS 232 full duplex isolated – used for printer
I/O port	1	D-SUB 15 for connecting the MD2020-CTB interface
EN54-2 Relay Outputs	5	Available by MD2020 CTB interface: NO/NC contacts rated at (resistive) 10A@125 VAC, 5A@30 VDC Max switching voltage 250 VAC, 30 VDC Max switching power (resistive) = 1,250 VA, 150 W Used for: Alarm, Failure, Delayed, System On, Power Ok (EN54-2)

Programmable Relay Outputs	4	Available by MD2020 CTB interface: NO/NC contacts rated at (resistive) 10A@125 VAC, 5A@30 VDC Max switching voltage 250 VAC, 30 VDC Max switching power (resistive) = 1,250 VA, 150 W Used as programmable output
Polarized Outputs (programmable)	14	Available by MD2020 CTB interface: Unipolar Output Port with Low-side driver. Each port is rated for driving loads 0,1A@24 VDC Used as programmable output
Contact / Push button inputs	2	Available by MD2020 CTB interface: Digital isolated and monitored input rated at 24VDC <sup>1</sup>
	2	Available by MD2020 CTB interface: Digital input rated at 24 VDC <sup>1</sup>
Dedicated Input	1	Available by MD2020 CTB interface: NTC 10k thermistor Used for cabinet temperature measurement
Powered Outputs	2	Available by MD2020 CTB interface: Bipolar monitored powered outputs for ALARM and FAILURE signalling. Rated at 24 VDC@50mA <sup>1</sup>

## Standard Reference

Standard	Description
EN 54-2:1997 incl. AC:1999+A1:2006	Fire detection and fire alarm systems - Part 2: Control and indicating equipment
IEC 60945:2002/COR1:2008	Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results
EN IEC 62923-1:2018	Maritime navigation and radiocommunication equipment and systems - Bridge alert management - Part 1: Operational and performance requirements, methods of testing and required test results
EN IEC 62923-2:2018	Maritime navigation and radiocommunication equipment and systems - Bridge alert management - Part 2: Alert and cluster identifiers and other additional features
IEC 60092-504:2016	Electrical installations in ships - Part 504: Automation, control and instrumentation
IEC 60533:2015	Electrical and electronic installations in ships - Electromagnetic compatibility (EMC) - Ships with a metallic hull

## Approvals

Body	Type Approval N°	Directive
RINA	in progress	Marine Equipment Directive MED 2014/90/EU
Lloyd's Register	in progress	
DNV	in progress	
TBD	in progress	MCA (Maritime Coastguard Agency)
TBD	in progress	Regulation (EU) No 305/2011 - Construction products

<sup>1</sup> The actual voltage depends on the value of the main power supply.