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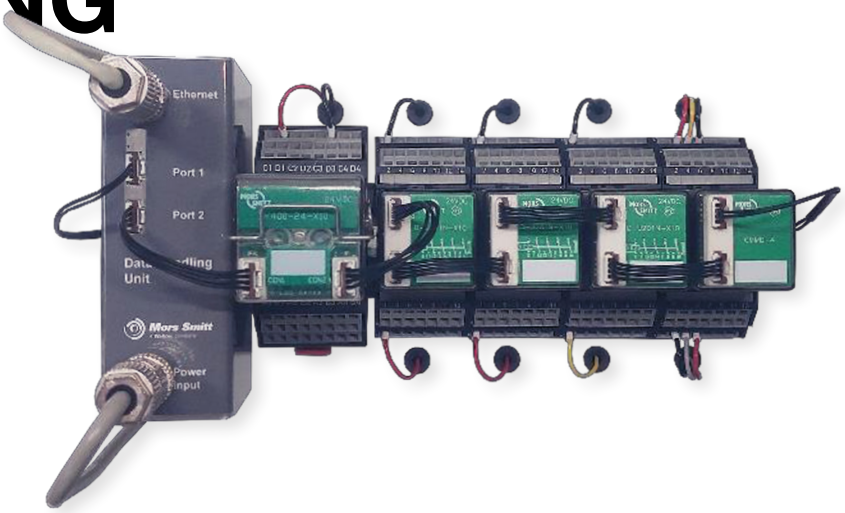
DATA SHEET

# SMART RELAY **MONITORING SYSTEM**




## RUGGED PLUG-IN RELAYS FOR EXTREME RELIABILITY, WITHIN LONG ENDURANCE APPLICATIONS AND HARSH ENVIRONMENTS

System to real-time measure and store information about relays and its connected devices, to determine the actual health, enable condition-based maintenance, improve system reliability, reduce life cycle cost and optimize sustainability.

## RAILWAY COMPLIANCY

EN 50155: 2017
IEC 60571: 2012
IEC 60077-1: 2017
IEC 60947-5-1: 2016
IEC 61373: 2010
EN 50121-3-2: 2016
EN 45545-2: 2020
NF F16-101/102
IEC 60947-5-4: 2002

CE

## THE SYSTEM CONSITS OF

**Voltage Measuring Module (VMM)** as option to D-U200N or B400 relay: measures relay coil voltage and uses this data to calculate the number of operations. Also measures relay internal temperature.

**Current Measuring Module (CMM)** measures current through connected devices e.g. the device being switched by the relay. Available with 2 or 4 measurement channels

**Data Handling Unit (DHU)** stores all measured data.

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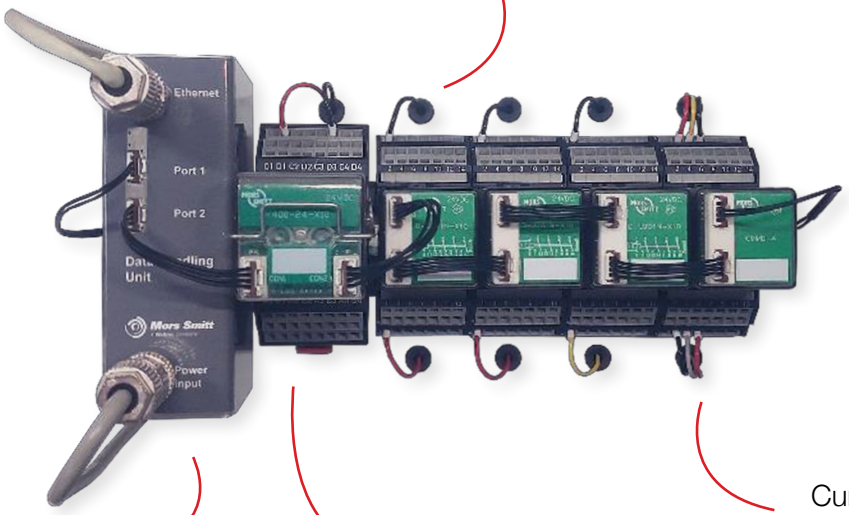


## APPLICATION

The smart Relay Monitoring System can be used in demanding rolling stock applications for predictive maintenance and fault-finding purposes.

## EXAMPLES

**Door circuit**
Monitor time between relay contact asking door to close and relay contact that shows it is closed. Time too long > door sticking or had mechanical problem.

**Monitor time**
for compressor being switched on until it reaches operating pressure. Time too long > compressor issues or air leaks.

**Relay life**
monitor operations and switching load to replace relay just before the lifetime is over.

**Monitor burning hours of cabin lights**
to replace them just before the lifetime is over.

**Measure current**
used by motor heating system. Current too high > motor issues.

**Monitor internal relay temperature**
Temperature is too high > issue with power / relay.

**Trouble shooting**
measure power levels and peak currents to find root cause of faltering fan.

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D-U200N relay with VMM option


B400 relay with VMM option

## SPECIFICATIONS

| Description | Parameters |
|---|---|
| Communication to DHU | Via serial bus<br>Daisy chain connections allowed |
| Power | Via DHU (5V) |
| Voltage measurement | Range 0-312 V DC (0.1V resolution)<br>Coil voltage read continuously<br>VMM reports changes in coil voltage to DHU<br>The DHU will count relay activations based on the VMM configured coil voltage |
| LED | Green LED blinking when communication is active |
| Temperature measurement | Temperature read continuously (1°C resolution)<br>VMM reports changes in temperature to DHU |
| MTBF | >500.000 hours |
| Stand-alone | No influence on correct relay working or performance |
| Protection degree | IP 40 when connectors are installed |
| Option to D-U200N relay or B400 relay | See D-U200N datasheet and B400 datasheet for information about D-U200N relay and B400 relay |
| Weight | ~ 140 gram |
| Connectors | VMM: Micro connector 4 pole (Molex 559350430) |


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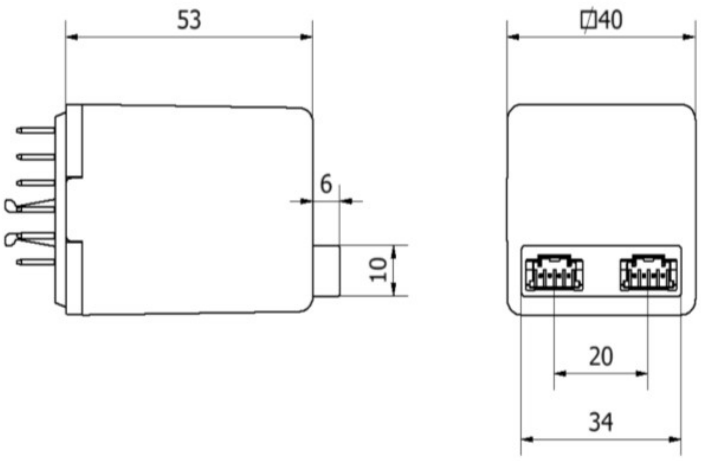
## DIMENSIONS (MM)




## CURRENT MEASURING MODULE

CMM in D-relay housing

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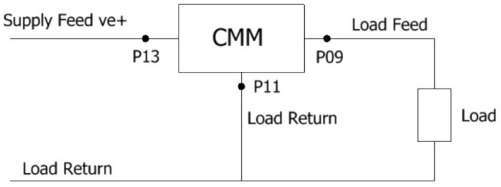
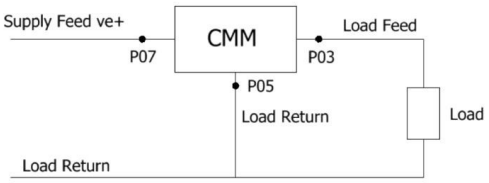
## SPECIFICATIONS

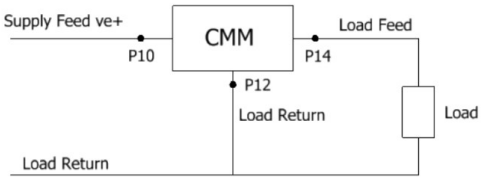
| Description | Parameters |
|---|---|
| Communication to DHU | Via serial bus<br>Daisy chain connections allowed |
| Power | 24-110 VDC |
| Channels | |
| Current measurement | Range 0-3A or 3-10A<br>Current read continously<br>CMM reports changes in current to DHU<br>Accuracy +/- 5% |
| LEDs | Green LED blinking when communication is active<br>For each channel a red LED: turns ON when current is detected (minimum 10mA for 0-3A range) |
| MTBF | >500.000 hours |
| Protection degree | IP 40 when connectors are installed |
| Weight | 2 channels: ~59 grams<br>4 channels: ~65 grams |
| Connectors | Micro connector 4 pole (Molex 559350430) |



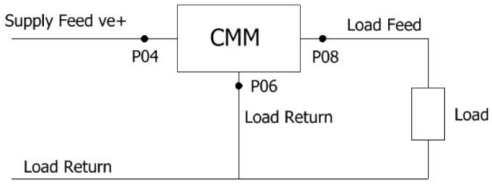

Wiring diagram Channel 1




Wiring diagram Channel 2




Wiring diagram Channel 3




Wiring diagram Channel 4

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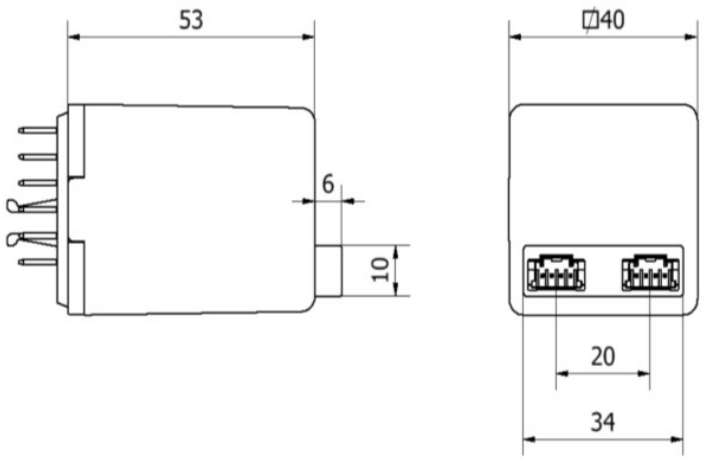
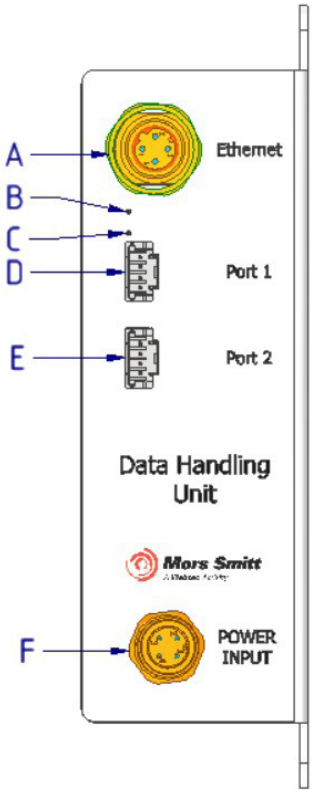
## DIMENSIONS (MM)




## DATA HANDLING UNIT




**A**. Ethernet: M12 female 4 pole shielded D-code adaptor (Harting 21033814410)
**B.** LED data transfer from Canbus Port 1/2
**C.** LED power status on
**D.** Canbus Port1 – Micro connector 4 pole (Molex 559350430)
**E.** Canbus Port2 – Micro connector 4 pole (Molex 559350430)
**F.** Power supply: M12 male 4 pole A-code adaptor (Harting 21033213401)

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## SPECIFICATIONS

| Description | Parameters |
|---|---|
| Communication to VMM/CMM | Via serial bus<br>Daisy chain connections allowed |
| LEDs | LED: data transfer from Canbus Port 1/2<br>LED: power status on |
| MTBF | >500.000 hours |
| Maximum number of connected measurement modules | 40 |
| Length serial bus | max. 500 meter |
| Protection degree | IP 40 when connectors are installed |
| Memory | 128 MB - Resembles 600 recordings per hour for 1 week for 60 datapoints<br>Data written flash memory – no data loss after cut-off power |
| Material housing | Aluminum 1.5mm RAL7035 light gray painted |
| Weight | Wall mounted: 335 grams<br>Rail mounted: 325 grams |
| Time | When connected to a laptop the time is automatically synchronized with the actual laptop time. |
| Output | .csv file |
| Protocol | Ethernet |

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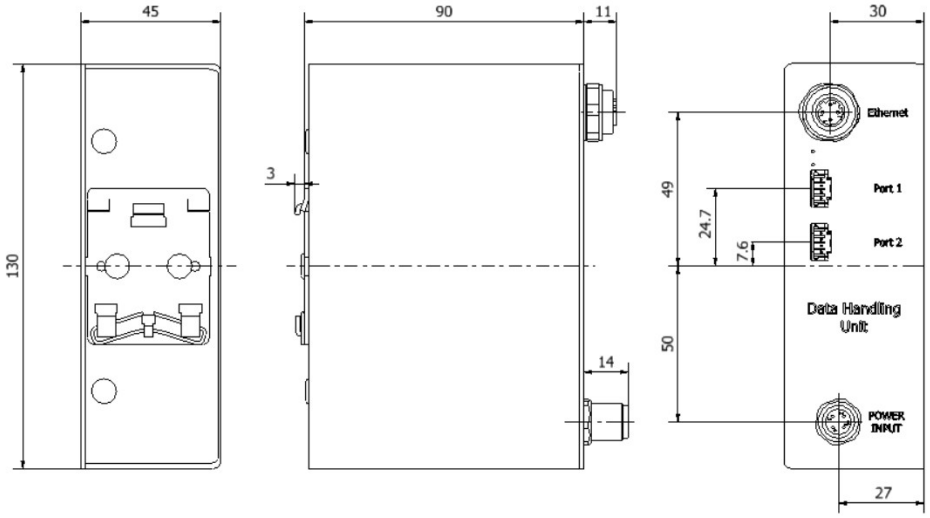
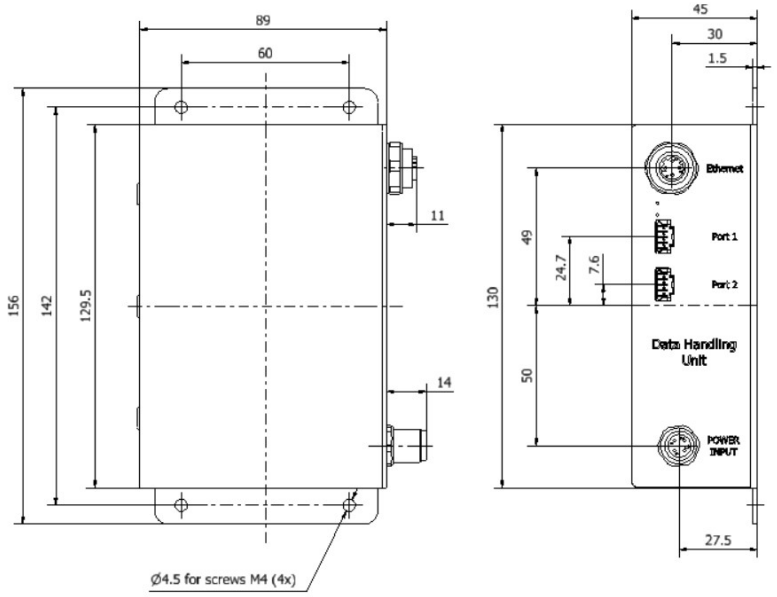
## RAIL MOUNTED




## WALL MOUNTED

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