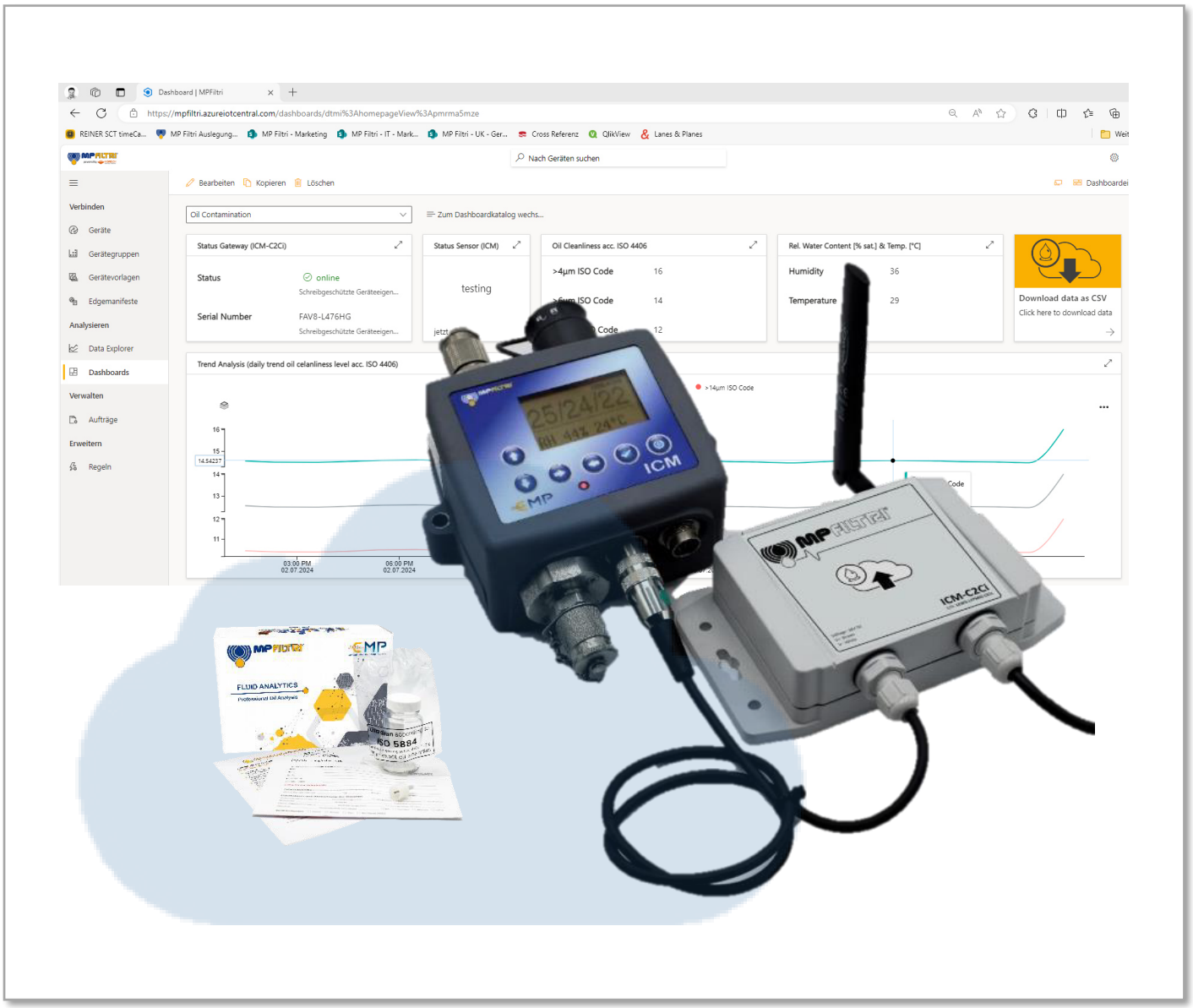
ICM-C2Ci & MP Smart Fluid

Cloud- and cellular transmission-based Monitoring of Fluid Contamination



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Description

The ICM-C2Ci is a gateway for the cellular-based transmission of measured values from a connected MP Filtri Inline Contamination Monitor ICM to the data acquisition, visualization and analysis solution MP Smart Fluid (cloud). In this way, an increased concentration of solid particles or water in fluid systems can be detected at an early stage, analyzed and measures can be derived. This helps to prevent damage, optimize maintenance schedules and sustainably reduce operating costs and the carbon footprint.

On the hardware side, the ICM-C2Ci is equipped with an 8-pin connector that is connected directly to an ICM 2.0 or ICM 4.0 via its CAN bus interface. In addition, the ICM is supplied with power directly via the existing 8-pin connector, so that only one power supply is required to operate the complete solution. This means that as soon as a power supply is established, the measured actual values are automatically and continuously transmitted via the cell phone network (GPRS/EDGE or LTE) to the MP Smart Fluid web application (hosted on Microsoft® Azure). As a result, this compact and flexible plug & play unit is suitable both for original equipment and for simple retrofitting of existing systems.

> Features

- Connection of a single Inline Contamination Monitor ICM for transmit measured values to the MP Smart Fluid cloud
- Plug & play solution for fluid analyses 4.0 directly on the machine
- Optimized for hydraulic and lubrication systems
- Easy to retrofit – and therefore ideal as an upgrade for existing installations of an MP Filtri Inline Contamination Monitor ICM
- Budget-friendly thanks to OPEX-orientated subscription model
- High data security and scalability due to Microsoft® Azure
- Tailored to your needs with adaptable visualization
- Automated alerting (e.g. by email) when defined thresholds are exceeded or falling below defined limit values for fluid contamination
- Option to forward data to other cloud systems
- The rugged IP 67 polycarbonate housing is suitable for both stationary and mobile applications.
- Expandable with MP Fluid Analytics - professional laboratory analyses for a comprehensive assessment of the fluid condition

> Benefits

- Reduction of life cycle costs (LCC) & total cost of ownership (TCO)
- Increase machine availability and reliability
- Optimization & control of personnel and service assignments
- More precise & competitive calculation of maintenance and service assignments - e.g. for full service contracts
- Can be used as part of quality assurance for documentation purposes
- A tool for optimizing operations and machines
- Global comparison of machines and systems in use (benchmark)

Think Holistic!

70 to 80 % of fluid system failures are due to contaminated fluid. For this reason, MP Filtri recommends permanent monitoring of fluid contamination with regard to solid particles and water content directly at the machine - e.g. with the Inline Contamination Monitor ICM 2.0.

However, it is not possible to draw conclusions about ageing conditions, mixing with other fluids, damaged system components or a holistic view of the medium using the inline contamination sensors.

For this reason, we recommend laboratory-based fluid analyses with MP Fluid Analytics as a supplement to measurements on the machine.

You can receive the results as a report in .pdf format conveniently by email or optionally via the MP Smart Fluid cloud portal (download). There you can also correlate the results determined in the laboratory directly with those measured on the machine.

ICM-C2Ci & MP Smart Fluid

Technical Data

Hardware: ICM-C2Ci

Communikation Interface

Mobile Communication	LTE Cat-NB1, LTE Cat-M1, 3G, GPRS (2G)
Frequencies	700 MHz, 850 MHz, 900 MHz, 1800 MHz, 1900 MHz, 2100 MHz
Functional logic	Automatic provider and network selection, LPWAN connection preferred
Supported countries	Germany, Austria, Switzerland, Italy, France and United Kingdom; Other countries on request, mobile phone standard depends on location
Transmission power	maximum 5,7 W (GPRS)
Device connection	▪ Sensor (machine connection ICM): 8-pin round plug, M16 (IEC 61076), female, for CAN bus and power supply ▪ Power supply ICM-C2Ci (looped through to ICM): via connection cable with open cable end
Status LED	Communication and device status (ICM-C2Ci only)

Web Application

User administration	OAuth2.0
Dashboard	.NET Core microservice architecture, Frontend: Node.js
Web Application	Hosted on Microsoft® Azure
Functions	Data visualization Data analysis Device management Data download Data routing Rule management (e.g. sending emails when limit values are exceeded)
Browser Compatibility	Google Chrome, Mozilla Firefox, Microsoft Edge, et al.

Device Properties

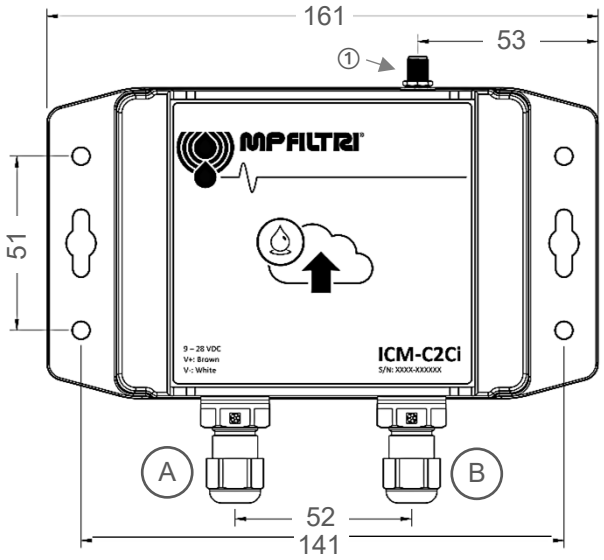
Enclosure material	Polycarbonate (PC)
Dimensions	161 mm x 130 mm x 38 mm
Protection class	IP 67
Ambient temperature	-25 … 60 °C | -13 … 140 °F (humidity max. 70%, non-condensing)
Integrated systems	CAN bus receiver, SIM card (multi-provider, 10 years connectivity), real-time clock (RTC)
Antenna	SMA antenna socket
Power supply	9 – 28 V DC, external
Power consumption	<5 W
Current consumption	<1,5 A
Back-up fuse	1 A
Connection cable	Material: PVC (suitable for outdoor use) 2 x 0.5 mm², 2-wire, shielded (sensor) and 4 x 0.25 mm², 4-wire, shielded (ICM-C2Ci)
Cable bushings	PG screw connection M12, IP 68
Weight	500 g (incl. ICM connector and 6.5 m connection cable)

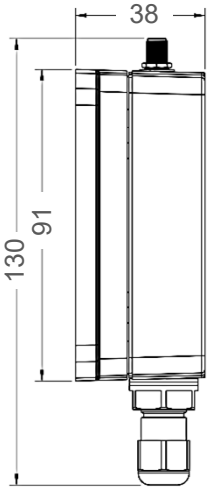
General information and scope of delivery

Certifications	CE, RoHS
Scope of delivery	▪ ICM-C2Ci gateway with connection cables (assembled and pre-assembled): 1.5 m sensor connection cable for ICM 2.0 / ICM 4.0 and 5 m connection cable with open cable end (not stripped) for power supply ▪ Short antenna (SMA connection) ▪ USB memory stick with product documentation

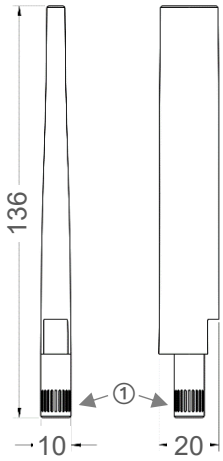
ICM-C2Ci & MP Smart Fluid

Dimensions





Antenna (detachable) for connection to SMA socket; foldable (max. 90°) and tiltable (360°)



All dimensions in mm

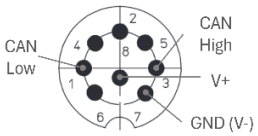
Electrical Connection and pin assignment

A

Connection cable ICM-C2Ci (2-wire, cable end open)

Wire	Assignment
brown	V+
white	V- (GND)

B

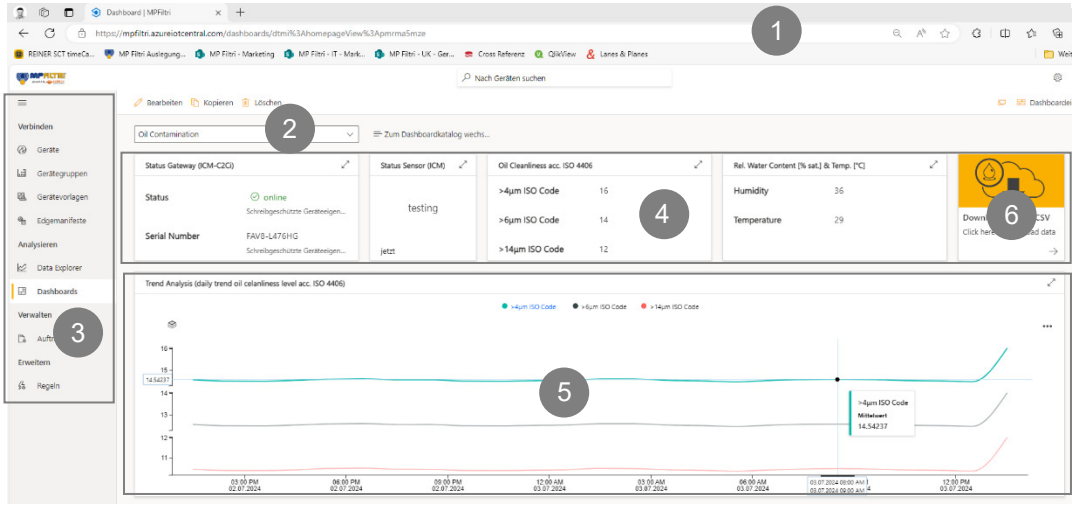


Sensor connector plug (8-pin, M16, female)

Pin	Wire	Assignment
1	white	CAN L
3	yellow	CAN H
7	brown	V- (GND)
8	green	V+

Web Application MP Smart Fluid (Cloud)

Standardized dashboard for data visualization and analysis of fluid contamination (dashboard content can be customized during the subscription period)



① Easy access via your browser - from anywhere

② Choose from individual views tailored to your needs

③ Switch between
- Device lists (inventory)
- Measurement data visualizations (dashboards)
- Measurement data analyses

④ Keep an eye on the live contamination of your machine

⑤ Carry out trend analyses

⑥ Download your measurements and lab reports with one click

ICM-C2Ci & MP Smart Fluid

Ordering Code

ICM 2.0 / 4.0 CELLULAR TRANSMISSION GATEWAY ICM-C2Ci*

Example: ICM-C2Ci | 1 | 1 | 1 | 1 | 1 | P01

Series
ICM-C2Ci ICM Communication to Cloud Interface

Signal input: Measuring system interface (hardware | protocol)
1 CAN | CAN generic

Signal output: Cloud interface/ communication (hardware | protocol)
1 Wireless: LTE (4G), 3G, GPRS (2G) | IP based

Area of application (country-specific network coverage)
1 Germany, Austria, Switzerland, Italy, France, United Kingdom

Connections (measuring system | power supply | cloud)
1 Connector 8 pole | 5m connection cable, open cable ends | Antenna: SMA

Enclosure
1 IP 67, Plastic housing (polycarbonate), wall mounting

Version
P01 Standard

* An MP Smart Fluid cloud subscription is mandatory for data access.

Subscription packages for the MP Smart Fluid web application (cloud)

Ex.: MP-Smart-Fluid | 1 | 1 | 0 | 1 | P01

Portal
MP Smart Fluid – Web application (cloud)

Host
1 Microsoft Azure

Cloud template
1 Standard

Extension module
0 Without

Cloud subscription contract term
1 1 year

Version
P01 Standard

Recommended Accessories

Item / ordering code	Description
ICM-USBi	USB parameterization interface ICM 2.0
CMP-SETUP-PACKAGE	Set-up fee ICM

The hardware (ICM) can be set up using a special set-up interface or by MP Filtri customer service (see accessories)