Calculus Impulse C07W

Universal communication gateway

When managing your data becomes a standard

Calculus centralizes your data in one digital cloud platform. One dashboard with an overview of all your data-collecting devices and systems, which you can control from all over the world. The data is processed and automatically translated into clear visuals and graphs. This gives you immediate insight into the operation and status of your installation, which gives you the opportunity to perform all the necessary actions on time. How does all that information get into the Calculus cloud when your installation is not connectable by default?

With the Impulse C07W.

BUSINESS DOMAINS

1. Asset management

The Calculus gateway measures or relays the desired data so you get the necessary information about all your fixed and mobile installations.

This way you can follow up your devices from one centralized location, detect malfunctions in time and send maintenance teams in the most efficient way and so on. The possibilities are endless. Location tracking of your mobile systems is possible through our GPS module, which comes installed by default.

You can track your devices online so you know where they are at all times.

With the built-in movement sensor it can send a position whenever moved, making it perfect for anti-theft.

A possible functionality is to execute commands sent from the cloud portal or from preprogrammed conditions. This gives you the opportunity to manage your installations quickly and remotely.

2. Estate management

Utility monitoring is a standard for estate management, but we can also easily visualize subsystems and technical parts of an installation in the cloud portal. You are able to monitor the efficient operation of your buildings as well as benchmark different locations or techniques for future investments or optimizations.

Regardless of whether you have measuring equipment or not, the Impulse C07W offers a solution to get your data in the cloud portal.

3. Industry 4.0

Measuring and following up production processes are a starting point for developing more efficient processes and optimizing the operation of your organization even further. A next step in process optimization is the analysis of production data.

Our analyses support your maintenance teams who can monitor the efficiency of devices and proactively plan their work. Thanks to our anomaly detection they will be alerted when abnormal values are registered. The early prediction of maintenance needs and functional deviations contributes to a higher safety and operational reliability of your installation.

YOUR DIGITAL PORTAL

1. Communication

We connect all your measurement equipment and systems to the cloud through our universal gateway: the Calculus Impulse C07W. Because of the wide variety of protocols the Impulse gateway supports, it is possible to interface with an enormous range of measurement equipment from multiple manufacturers. The best thing about this is access to all your data in one centralized portal. Is your installation not equipped with measurement equipment yet? We can help you choose the best solution.

2. Data transmission

Our gateway offers multiple options to get your data to the cloud, depending on your specific needs. The options we provide allow you to capture the smallest, but also the largest data streams with redundant solutions as a possibility.

3. Data storage

All your data is securely stored in a redundant server environment.

We offer flexible pricings for your data, with changeable sample intervals and storage terms, meaning there is always a solution that suits your needs.

4. Cloud portal

Your portal is accessible online and therefore reachable by any device with an internet connection, wherever you are. This portal offers a real-time status overview of all your systems. Historical data analysis, benchmarking between systems or data, and reporting of events are default functionalities in the portal. Even advanced features like polygonic geofencing, and drawing your own data-flow schematic are disposable at your fingertips.

5. Data-analyzing

We help you to get the maximum out of your big data and to visualize it in our online portal. Through business intelligence we analyze your data automatically and detect patterns and deviations.

All the necessary information or even alarms are reportable to the correct users by SMS, e-mail, push messaging, or just normal portal warnings.

We are working at this very moment to push proven algorithms derived from your collected big data and fog computing back to your devices to make decisions locally in case the cloud is not reachable to call the shots. Examples are the finetuning of HVAC settings based on outside factors, or prediction of power usage and making sure the right amount of power is available at the right time.

SPECIFICATIONS

MECHANICAL

Mounting	35mm DIN-rail mounting module
Enclosure protection degree	IP20
Weight	275 g
Operating temperature	-20°C … +65°C
Storage temperature	-25°C … +85°C
Operational position	Horizontal
Measurements	128 x 94 x 65mm

POWER SUPPLY

Nominal voltage	12-24V DC
Tolerance	-50%.. +50%
(not recommended for everyday usage)	6.. 36V DC
Power consumption (in default configuration)	3 watt nominal
Max. power consumption	25W
Power connections	Industry standard pluggable connectors
Reversed polarity protection	Yes
Internal protection	Yes, by fuse

BASIC PROPERTIES

Internal memory	4 GB user data available
Internal temperature monitoring	Yes
Internal power supply monitoring	Yes
Internal RTC battery backup	Yes, up to 24 hours
GPS	Yes (SMA female)
Software	Calculus platform / Over-the-air updates / Fog computing capabilities
Extreme low power mode	Yes
Motion sensor for wake-up	Yes
LED status indication	Independent power supply check, gateway health, cloud connection, expansion card health
Optional communication/expansion slots	2

CLOUD COMMUNICATION CAPABILITIES

		Default	Optional
Ethernet	2 independent 10/100 Mbit/s, RJ45 to secure LAN from WAN	•	
WIFI	802.11 b/g/n 2.4GHz (RP-SMA female)	•	
LoRa (LPWAN)	Yes		•
Sigfox (LPWAN)	Yes		•
Cellular	2G and 4G		•

COMMUNICATION

		Default	Optional
Industrial ethernet protocols	Modbus TCP, Profinet, EtherCat	•	
RS-485 / Modbus RTU	Yes		•
Serial port RS-232	Yes		•
1-Wire	Yes, with parasitic power support	•	
Wired M-bus	Yes		•

I/O

		Default	Optional
Standard I/O	2 digital inputs (5 - 24V DC) / 2 digital outputs (5 - 24V DC)	•	
Pulse counter	2 inputs, with battery backup		•
General I/O expansion	4 inputs (operating range: 5 - 24V DC)		•
	2 relay outputs / output current (h/p): 50mA/100mA		•
Energy and power quality meter	Multiphase voltage and current sensors (non-invasive transformer and Rogowski coil supported)		•
Custom expansion cards	I/O or communication combination tailored to your needs		•

SOFTWARE

Calculus portal compliant	Yes
VPN tunneling	Yes, currently supporting DEIF utility tool out of the box