

### 11.31.15.03 Monitoring well modem with GPRS / e-mail functionality

#### Technical specifications

Message mode	: e-mail GSM / GPRS Quad band (900-1800 / 950-1950 MHz)
Number of sensor ports	: 2
	: Port 1 e+ sensor / Diver (external)
	: Port 2 internal baro sensor
	: Port 3 Analogue sensor (external) (4..20 mA of 0..5 V)
Temperature (operating range)	: -20 ... +50 °C
Memory capacity	: Max. 15000 log intervals
Measuring frequency	: between 1 min. and 99 hours
Integrated barometer	: Optional. for barometric Diver compensation
	: Measuring range 400 ... 1150 mbar (≈ cm H <sub>2</sub> O)
	: Accuracy baro sensor max. 0.5 cm <sup>Note 1</sup>
	: Resolution baro sensor 0.1 mbar (cm) typical
	: Data storage in monitoring well modem
Integrated temperature sensor	: Measuring range -40 ... +125 °C
	: Resolution 0.01 °C
	: Accuracy temperature 2 °C <sup>Note 2</sup>
Antenna	: Quad band (900-1800 / 950-1950 MHz)
	: Connector: bulkhead
	: Dimensions pillar antenna 55 mm x 9.65 mm
	: Other antenna types available on request

#### Functional specifications

Time synchronisation	: Modem clock synchronisation on initiative of monitoring well modem with NTP server
Accuracy external logger	: Equal to logger
Accuracy internal baro	: Equal to integrated baro sensor
Accuracy analogue port	: 10 uA / 2.5 mV
Real Time Clock	: Summer / winter time adjustable
Alarm	: Direct e+sensor (SMS and e-mail) alarm when alarm value is exceeded (optional Diver alarm when using the integrated baro sensor)

#### Power supply

Voltage	: 3.6 V
Battery	: Art. no. 11.31.25, replaceable by user
Battery life time	: > 10 years with the use of e-mail <sup>Note 3</sup>

#### Housing

Dimensions	: Diam. tube = 48.3 mm, diam. top = 60 mm, length tube = ca. 340 mm
Protection	: IP67
Material	: Housing stainless steel 304, top POM
Weight	: Ca. 1750 gr.

#### Particularities

SIM card exchangeable by user

Note 1 At 25 °C

Note 2 Meant for temperature compensation of the baro sensor measurement and the "don't send below" functionality.

Note 3 Wakeup interval 3 x p/d, send interval 1 x p/d, log interval 1 x p/u, signal reach better than -75 dB

#### Options

11.31.15.01	Monitoring well modem with internal baro sensor
11.31.15.02	Monitoring well modem with analogue port
11.31.15.02.01	Adapter plug for analogue sensor
11.31.15.04	Monitoring well modem with data redundancy (data sent double for improved data communication security)

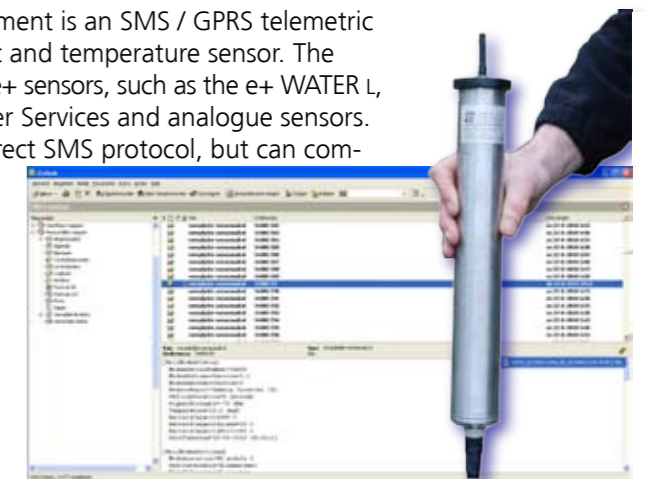
All information contained in this flyer is current at the time of publication. Our commitment to product improvement requires that we reserve the right to change equipment, procedures and specifications at any time.



## e-SENSE® monitoring well modem

The monitoring well modem from Eijkamp Agrisearch Equipment is an SMS / GPRS telemetric system with integrated datalogger, e-mail client and barometric and temperature sensor. The monitoring well modem is able to communicate with Eijkamp e+ sensors, such as the e+ WATER L, e+ RAIN and the e+ SOIL MCT, Divers® from Schlumberger Water Services and analogue sensors. The monitoring well modem is compatible with the e-SENSE direct SMS protocol, but can communicate fully by means of e-mail without the need for additional intervening software.

The monitoring well modem is able to communicate using normal e-mail programmes, such as Windows Outlook (Express) and Thunderbird (Mozilla). For example, the monitoring well sends an e-mail every day with an attachment in MON or CSV format. As a result, the monitoring well modem can be used for small and large projects.



### Internal compensation and sending alarms

The monitoring well modem has an internal barometric sensor with logger, by means of which the Diver measuring data can be adjusted directly. This allows not only e+ sensors but also Divers to send a direct alarm. Alarms can be sent via SMS or e-mail or a combination of both. The alarm report may be sent directly from the monitoring well modem to a GSM in readable text without the need for any intervening additional software. Alarm reports may consist of adjustable high-or-low alarm with hysteresis, a level fluctuation or system reports, such as 'replace battery'.

### Synchronisation

The monitoring well modem is the central brain in the system and will ensure that the connected e+ sensor/Diver runs in synchronicity with the internal barometric sensor and with the optional external analogue input. The system has an accurate clock that can regularly be synchronised with e-SENSE direct or with an NTP server (extremely accurate clock on the internet). In addition, the monitoring well modem has autonomous summer/winter time detection.

### Support for MON files

When the monitoring well modem sends an e-mail, the data is attached in the form of MON or CSV files. If Divers are being used, the MON files are compatible with LoggerDataManager (LDM) and Diver-Office.



## e-SENSE direct

It is of course also possible to have the monitoring well modem transmit compatible SMS reports by means of e-SENSE direct. e-SENSE direct makes it possible to process and export data and to send changes to the monitoring well modem. e-SENSE direct offers the option of reading and processing the data directly with the assistance of the Open Interface (SQL).

## Analogue input

A flow meter, pH sensor and (additional) pressure sensor, for example, can be connected to the analogue input. The analogue input also has the same options for transmitting alarms as the e+ sensors / external Diver and internal barometric sensor. This analogue input is able to measure electrical current (4 - 20 mA) or voltage (0 - 5 volt) and convert it into the physical quantity.

## Security

Apart from simple configuration by means of SMS and/or e-mail, the system also has good security. The system will accept e-mails and SMSs from known senders only and can in addition be secured with a password.

## Reliability

The monitoring well modem communicates through the universal and stable GSM network for SMS and e-mail. If required, the monitoring well modem can also make use of data redundancy. This guarantees a high level of reliability for global data exchange. This means that not only the data from the latest transmission is sent, but also the data of the previous 1 or 2 transmission periods. You thus receive all the data 2 or 3 times. Should an e-mail or SMS message go missing or be corrupted, data redundancy provides you with maximum security.

## Cost-cutting with e-mail

If the monitoring well modem sends e-mails, the receiver does not need a SIM card. More data can be included in an e-mail, resulting in an increase in data density and a reduction in costs per measurement.

## Cost-cutting with SMS

When using SMS, the monitoring well modem is able to adjust the data from external sensors, such as a Diver, using the internal barometer. The monitoring well modem then has to send only the adjusted data, saving costs as a result.

## Easy installation

The monitoring well modem needs to be opened only in order to insert the battery and the SIM card. Subsequently, the system can be configured from a PC, a laptop, at your office or in the field. Configuration proceeds by means of the e+ infrared communicator with the e-SENSE configuration software. You are also able to configure the monitoring well modem entirely from your office and later start it up in the field with the press of a button. The status of the monitoring well modem is indicated by means of a green or red led, once the status button has been pressed.

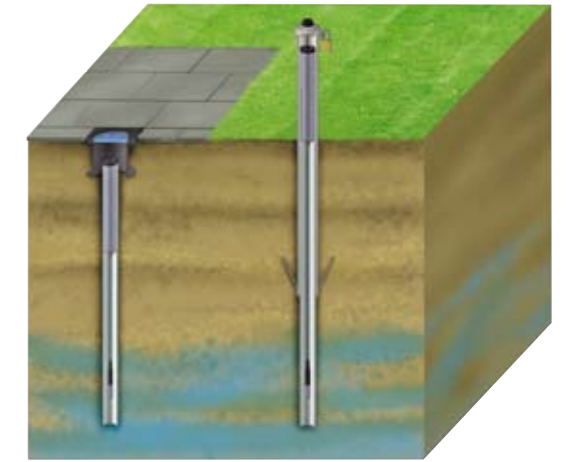
## Maintenance

The stainless steel housing and the extremely long battery life mean that the system needs very little maintenance. The monitoring well modem has been developed as a dynamic system, meaning that the system will be further developed in the future. It is possible to install new software and functionality in the monitoring well modem by remote control.



## Characteristics of monitoring well modem

- Battery operating life of more than 10 years
- Simple installation in the field
- Supports e+ sensors
- Supports Divers
- Supports analogue input 4 – 20 mA / 0 – 5 volt
- Internal barometric compensation
- Direct alarm transmission (including for Divers) by readable SMS to end-user and e-mail
- No back office software needed
- Interchangeable antenna (standard and robust)
- Data redundancy
- NTP support, clock synchronisation through the internet



Monitoring well modem with Diver installed in street cover and above ground protective casing

## Specifications

### 11.31.15 Monitoring well modem with SMS functionality

#### Technical specifications

Message mode	: SMS (GSM Quad band)
Number of sensor ports	: 2
	: Port 1 e+ sensor / Diver (external)
	: Port 2 internal baro sensor
	: Port 3 Analogue sensor (external) (4..20 mA or 0..5 V)
Temperature (operating range)	: -20 ... +50 °C
Memory capacity	: Max. 15000 log intervals
Measuring frequency	: between 1 min. and 99 hours
Integrated barometer	: Optional. For barometric Diver compensation
	: Measuring range 400 ... 1150 mbar (≈ cm H <sub>2</sub> O)
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	: Resolution 0.01 °C
	: Accuracy temperature 2 °C <sup>Note 2</sup>
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	: Connector: bulkhead
	: Dimensions pillar antenna 55 mm x 9.65 mm
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#### Functional specifications

Time synchronisation	: Modem clock synchronisation on initiative of monitoring well modem with e-SENSE direct
Real Time Clock	: Summer / winter time adjustable
Accuracy external logger	: Equal to logger
Accuracy internal baro	: Equal to integrated baro sensor
Accuracy analogue port	: 10 uA / 2.5 mV
Alarm	: Direct e+sensor alarm when alarm value is exceeded (optional Diver alarm when using the integrated baro sensor)

#### Power supply

Voltage	: 3.6 V
Battery	: Art. no. 11.31.25, replaceable by user
Battery life time	: With SMS > 2 year <sup>Note 3</sup>

#### Housing

Dimensions	: Diameter tube = 48.3 mm, diameter top = 60 mm, length tube = ca. 340 mm
Protection	: IP67
Material	: Housing stainless steel 304, top POM
Weight	: Ca. 1750 gr.

#### Particularities

SIM card exchangeable by user

Note 1 At 25 °C

Note 2 Meant for temperature compensation of the baro sensor measurement and the "don't send below" functionality.

Note 3 Wakeup interval 1 x p/d, send interval 1 x p/d, log interval 1 x p/hr