

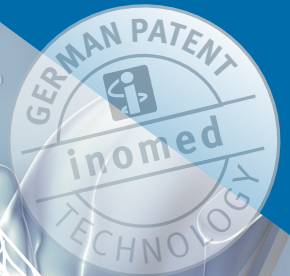
**pIOM**<sup>®</sup>

**inomed** 

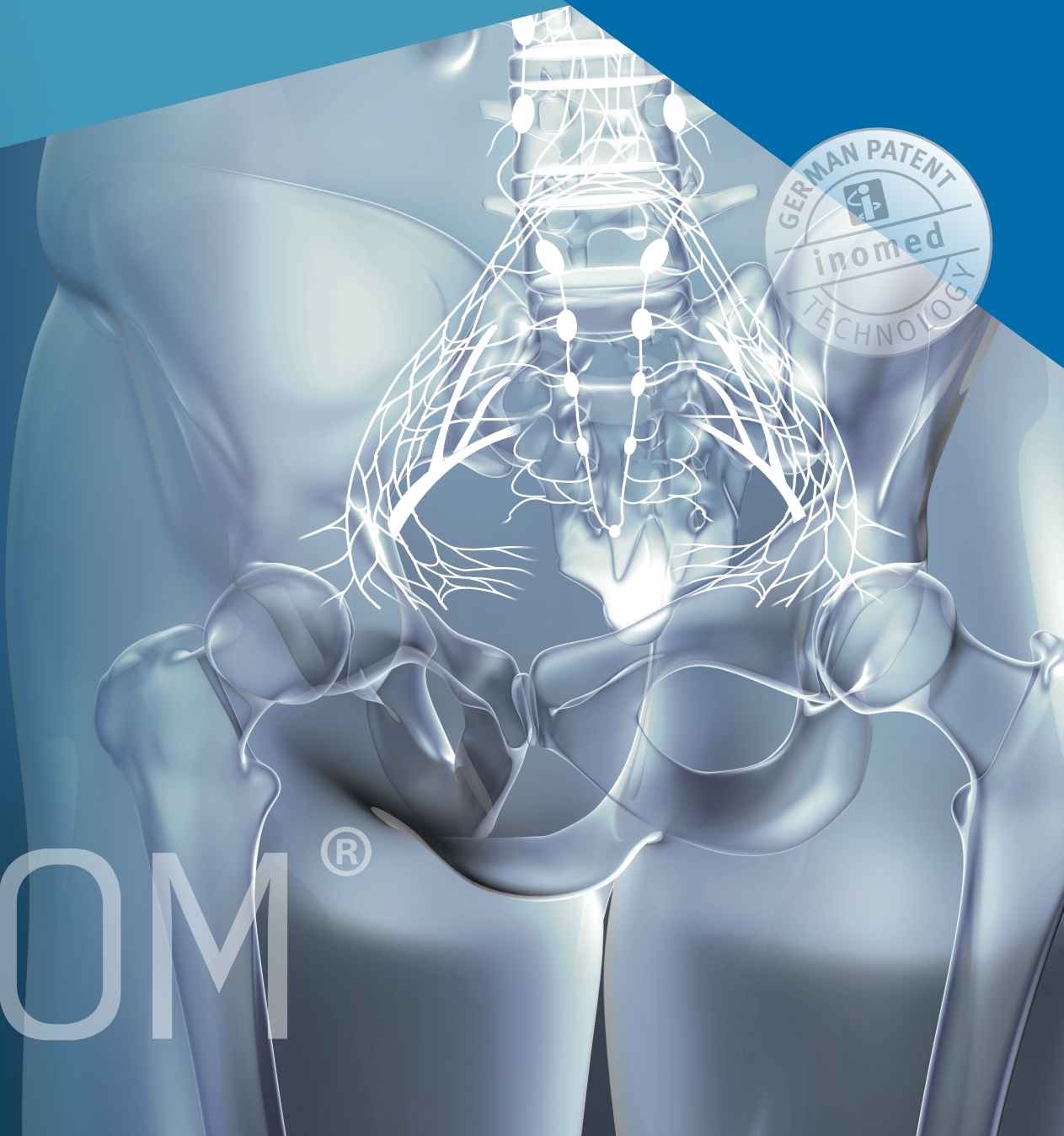
**C2 NerveMonitor**

APPLICATION FIELD  
Rectal surgery

Pelvic  
neuromonitoring



**pIOM**<sup>®</sup>





## C2 NerveMonitor

Neuromonitoring in colorectal surgery

# Improved patient safety thanks to neuromonitoring of autonomic nerves

After more than twelve years of clinical research, it is now possible to localize the complex nerve structures of the autonomic nervous system in the pelvis minor and monitor their function by using the german patented pIOM® technology.

Many interventions in the field of colorectal surgery which pose a risk to the complex autonomic nervous system are possible as fields of application (e.g. total mesorectal excision and resection rectopexy).

### Better quality of life for patients after surgical interventions in the pelvis minor

Statistics for postoperative anorectal and urogenital functional disorders show that a majority of patients suffer from **incontinence and sexual dysfunction** after surgical interventions in the pelvis minor.<sup>1</sup>

RECTAL cancer is one of the most common forms of cancers worldwide. pIOM® technology can help preserve the functions inside the pelvis minor after surgery despite invasive therapy.<sup>2</sup>

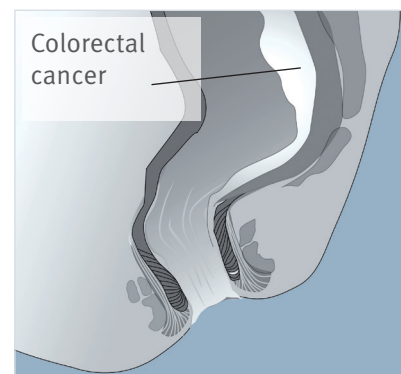
<sup>1</sup> Lent V., Junginger T., Nervenstörungen der Harnblasen- und Sexualfunktionen nach Rektumresektionen und -extirpationen, Chirurgische Allgemeine Zeitung, 12 (2012)

<sup>2</sup> Kauff D.W., Kneist W., Risk Factor Analysis for Newly Developed Urogenital Dysfunction after Total Mesorectal Excision and Impact of Pelvic Intraoperative Neuromonitoring - a Prospective 2-Year Follow-Up Study, Journal of Gastrointestinal Surgery, 6 (2017)

<sup>3</sup> Wałęga P. et al. "Intraoperative neuromonitoring of hypogastric plexus branches during surgery for rectal cancer - preliminary report," Polski przegląd chirurgiczny, 89/2 (2017)

## APPLICATION EXAMPLE: TME

The pelvic neuromonitoring is a useful addition to the method of total mesorectal excision (TME). The pIOM® technology allows a more gentle surgery especially for the nerves than the normally used maximal resection.



Rectum with colorectal cancer

Function of the continence organs is intraoperatively monitored using the pIOM® technology for pelvic neuromonitoring. Therefore, the risk of nerve injury and neurogenic sequelae may potentially be minimized.

The stimulation site in the minor pelvis is the inferior hypogastric plexus and the pelvic splanchnic nerves. Urogenital and anorectal function is monitored by bladder pressure measurement and monitoring of the internal anal sphincter activity.

The procedure is simple for the surgeon and does not cause considerable surgical delay.<sup>3</sup>

# piOM<sup>®</sup> Software application

## Wizard structure

The user is guided through the intraoperative monitoring process step by step, beginning with entering the patient's data:



piOM 10:49

**OPERATION DATA**

Surgeon  
Anaesthetist  
Comment

**PATIENT DATA**

Patient ID\*  
Barcode or Keyboard input

Last name\* First name  
Date of birth Gender

\*Mandatory Fields

Patient Exit Electrode Type Selection

Electrode Type Selection 11:43

Needle Electrodes

Rectal Electrode

Operation Data Selection Pressure Sensor Placement

Pressure Sensor Placement 10:5

1. Connect the piOM Box connection cable into the front panel of the system.  
2. Connect the piOM Box USB cable to the USB connector on the right side of the system.  
3. Connect the pressure sensor to the cable on the piOM Box.

piOM Box connected correctly

Electrode Type Selection Electrode Placement

Electrode Placement 10:55

1. M. Sphincter ani externus  
2. M. Sphincter ani internus

1. Insert the green electrode into the fatty tissue of one buttock. Connect the electrode with the green connector of the piOM Box.  
2. Insert the grey/black electrode to the internal anal sphincter. Connect the grey/black electrode to the "M. Sphincter ani internus" connectors of the piOM Box.  
3. Insert the blue disk electrode into the external anal sphincter. Connect the blue/black electrode into the "M. Sphincter ani externus" connectors of the piOM Box.

Electrodes connected correctly

Pressure Sensor Placement Measurement Window

Rectal electrode 10:55

1. Insert the green electrode into the fatty tissue of one buttock. Connect the electrode with the green connector of the piOM Box.  
2. Insert the grey/black electrode to the internal anal sphincter. Connect the grey/black electrode to the "M. Sphincter ani internus" connectors of the piOM Box.  
3. Insert the blue disk electrode into the external anal sphincter. Connect the blue/black electrode into the "M. Sphincter ani externus" connectors of the piOM Box.

Electrodes connected correctly

Pressure Sensor Placement Measurement Window

Measure 10:58

Stimulation on  
7.00 mA

M. Sphincter Ani Internus  
0 0 1 μV Max

Bladder Pressure  
-18 0 3 cmH<sub>2</sub>O Max

Electrode Placement Comment Report

Report 10:59

Time	Activity	Comment
12:55:43	Initialization Channel 2 IM Sphincter ani externus internus connected Channel 3 IM Sphincter ani externus internus connected Channel 4 Bladder connected	
15:58:20	Assess on one channel Stimulator @ 0.5 mA Maximum current 7 mA Relaxation: Yes	
15:58:24	Assess on one channel Stimulator @ 0.5 mA Maximum current 7 mA Relaxation: Yes	

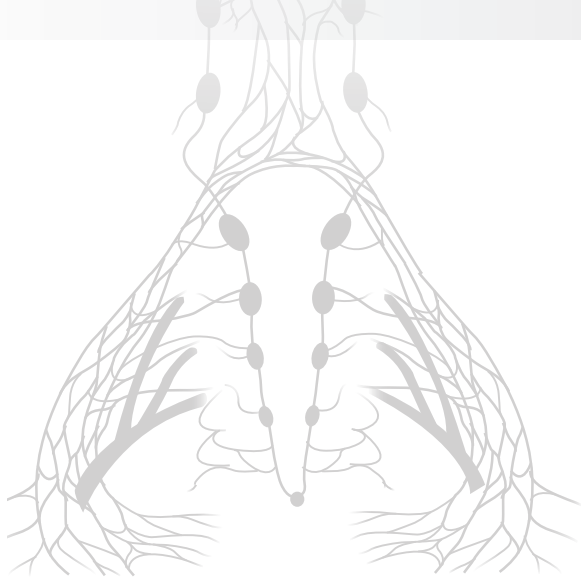
Measurement Window Set Comment Print Preview

Report 10:59

Print Preview

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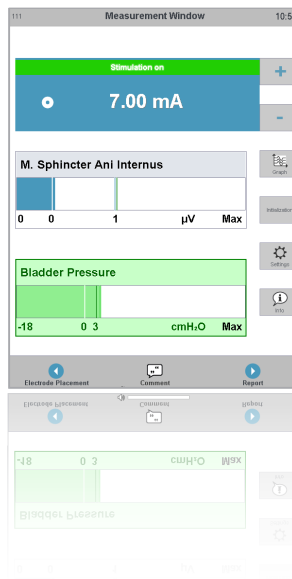
Report Print



» German patented technology



**pIOM**<sup>®</sup>



## Measurement mode

The anorectal function is monitored in realtime: needle electrodes are placed in the internal and external anal sphincter. Alternatively, a non-invasive rectal electrode can be used for easier pre-operative preparation.

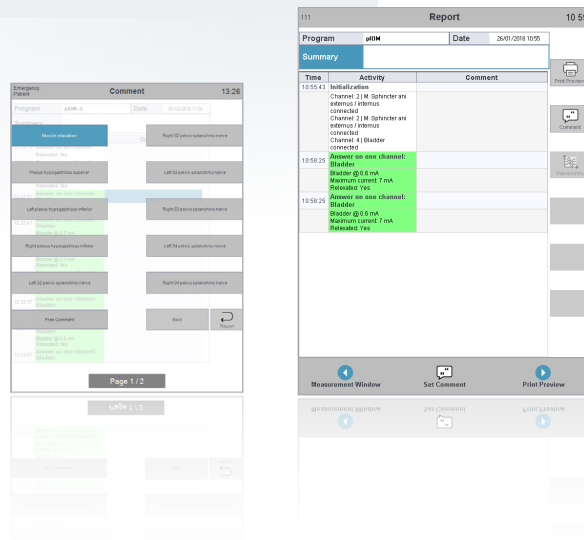
The urinary function is monitored with the help of a pressure sensor which is placed as a complete connection set between the urinary catheter and the urine bag.

Stimulation of the pelvic nerves is carried out using a specially developed hand probe. The surgeon can localize the individual nerve branches and monitor their function.

If any activity occurs, the surgeon will be notified immediately visually and acoustically. Different events are processed and visualised quickly and easily in the form of coloured bars. At the same time, the electrical current flow is continuously indicated acoustically during stimulation.

## Documentation

C2 pIOM<sup>®</sup> Software automatically stores all events and comments and lists them in the report. The user can therefore review each individual stimulation response at any time, also retrospectively.



# plOM<sup>®</sup> Accessories



Art.-No. **508 240**  
**C2 NerveMonitor 4-channel system**  
 Art.-No. **508 280**  
**C2 NerveMonitor 8-channel system**  
 for intraoperative nerve monitoring.  
 Easy to use EMG monitor with two integrated stimulation channels, loudspeaker, footswitch and mains lead



Art.-No. **508 513**  
**plOM<sup>®</sup> Software Module for C2**  
 provides automated functions for EMG monitoring, bladder pressure measurement and direct nerve stimulation during pelvic surgery, applicable to C2 software version 4.0 or higher



Art.-No. **520 335**  
**plOM<sup>®</sup> Set with SDN electrodes**  
 complete set consisting of a catheter connection set for bladder pressure measuring, SDN electrodes, fork probe 400mm  
 › single-use only  
 › ETO-sterilized

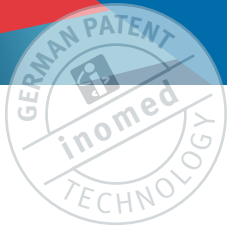


Art.-No. **520 336**  
**plOM<sup>®</sup> Set with rectal electrode**  
 complete set consisting of a catheter connection set for bladder pressure measuring, rectal electrode, fork probe 400mm  
 › single-use only  
 › ETO-sterilized







Art.-No. **520 300**  
**plOM<sup>®</sup> Box for bladder pressure measuring**  
 with 1.5mm female touchproof connector, USB powered  
 › for connection to IONM devices  
 › delivered non-sterile  
 › non-autoclavable

FURTHER  
LITERATURE



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-  Intraoperative Neuromonitoring
-  Functional Neurosurgery
-  Pain Treatment
-  Neurological Diagnostics