

**PAJUNK®**

## *MultiStim SWITCH and MultiStim SENSOR*

*Setting the trend in nerve stimulation*



**Plexus and Epidural Anaesthesia**

## *The essential advantage regarding safety*

# **MultiStim SENSOR and MultiStim SWITCH**

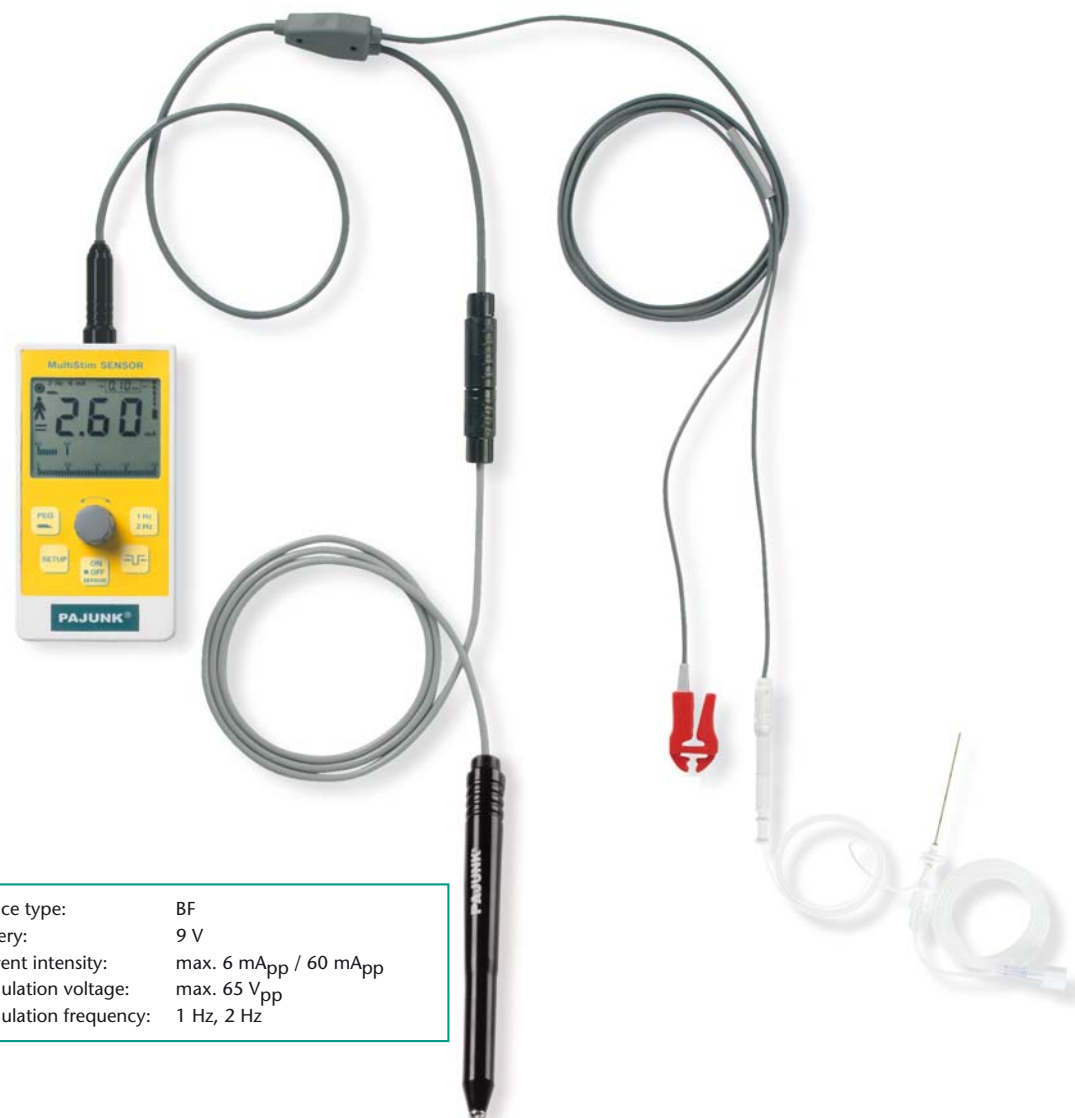
With **MultiStim SENSOR** and **MultiStim SWITCH**, PAJUNK® has founded a new generation of nerve stimulators in regional anaesthesia.

Both devices offer a variety of functions for more safety and efficiency, and are convincing due to the following advantages:

**Aside of a number of identical functions, the two devices are, however, different in the following functions:**

The **MultiStim SENSOR** supports patient friendly, percutaneous localization and identification of nerves with the aid of a stimulation handle: the

PEG-electrode (Percutaneous Electronic Guidance) – a fundamental distinctive feature in relation to conventional stimulation devices.



Device type:	BF
Battery:	9 V
Current intensity:	max. 6 mApp / 60 mApp
Stimulation voltage:	max. 65 V <sub>pp</sub>
Stimulation frequency:	1 Hz, 2 Hz

- Large, clearly arranged display
- Analogous setting of the intensity of the stimulation current by means of a notched turning-knob

- Integrated safety functions
- High-precision, microprocessor-controlled adjustment of constant current

The **MultiStim SWITCH** has revolutionized nerve stimulation through two outstanding innovations:

→ The new function indicating the patient resistance permits the instant detection of intraneural, intravascular and intrathecal cannula placement, which can be corrected immediately.

→ A switch-over function enables the anaesthetist to either select the catheter or the cannula for the stimulation by a simple keystroke. The maximum current intensity will thereby correspond with the distinct, varying requirements of peripheral and epidural nerve stimulation.



Device type:	BF
Battery:	9 V
Current intensity:	max. 6 mA <sub>pp</sub> / 20 mA <sub>pp</sub>
Stimulation voltage:	max. 95 V <sub>pp</sub>
Stimulation frequency:	1 Hz, 2 Hz

## Easy to view – simple in application

# The MultiStim SENSOR



While the exact insertion point is determined by means of anatomical landmarks when conventional stimulation equipment is being used, the **MultiStim SENSOR** optionally also permits the location of the puncture site with the aid of the PEG-electrode (Percutaneous Electrode Guidance).



### Percutaneous nerve localization with handle

When using the PEG-electrode, the nerve is stimulated through the skin without requiring a puncture, which will evoke a reflexive response when the nerve is encountered.

The cannula is introduced at the insertion point identified by means of this method, and the stimulation current is then switched over to the cannula by keystroke. The placement of the cannula is performed in the usual manner.

### PEG- and Cannula button\*

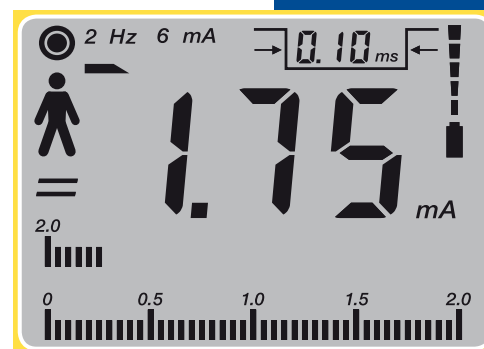
Pressing the PEG- or Cannula button will cause the stimulation to be switched to the handle or to the cannula, as may be required. The respectively active electrode will thereby be indicated by means of a corresponding status indicator in the display. The intensity and the frequency of the stimulation current, as well as the pulse width can be adjusted separately for both outputs. This button will remain without function if no PEG-handle has been connected.

\* only if the optional PEG-cable and electrode are used



### Nominal/actual stimulation current intensity

The intensity of the stimulation current actually flowing through the patient is measured constantly, and is indicated numerically as well as by bar graph indicator on the display. The nominal and actual currents are also constantly compared and indicated visually or acoustically, if the intensity of the actually flowing current differs from the adjusted current intensity.



### SETUP

The device has been provided with a SETUP-function. This function permits the user himself to determine his individual initial parameters for the percutaneous and invasive applications.



### ON/OFF

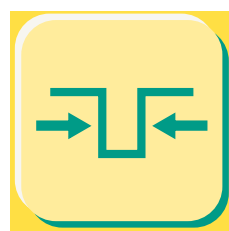
#### PAUSE

The stimulation can be interrupted at any time with the PAUSE – button. The settings of all stimulation parameters can be changed without emitting impulses, while the device remains attached to the patient.



### Adjustable stimulation pulse width

The stimulation pulse width can be adjusted fast and simple with a button of its own in a number of steps – with intervals ranging from 0.05 ms, 0.1 ms, 0.2ms, 0.3ms, 0.5 ms to 1.0ms, e.g. for the selective stimulation of sensory and motor nerve fibres in mixed nerves.



## MultiStim SWITCH

# Brings the future of stimulation right to the point

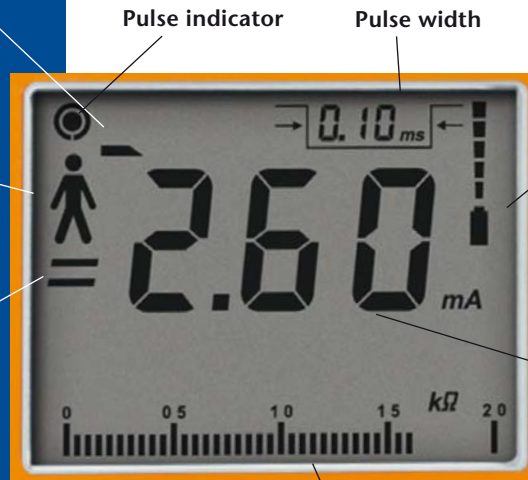
PAJUNK® MultiStim SWITCH can be used for the location of peripheral nerves and also for epidural stimulation. Its application is recommended for all

purposes requiring the identification of nerves, bundle of nerv fibers and nerve roots. With this device,

Active output, for example "Cannula"

Actually flowing current

NOMINAL/ACTUAL current



Pulse indicator

Pulse width

Battery condition

Current intensity

Patient resistance

Switch-over key "CATH" / "Cannula"

SETUP

ON/OFF/PAUSE



Pulse frequency

Turning-knob

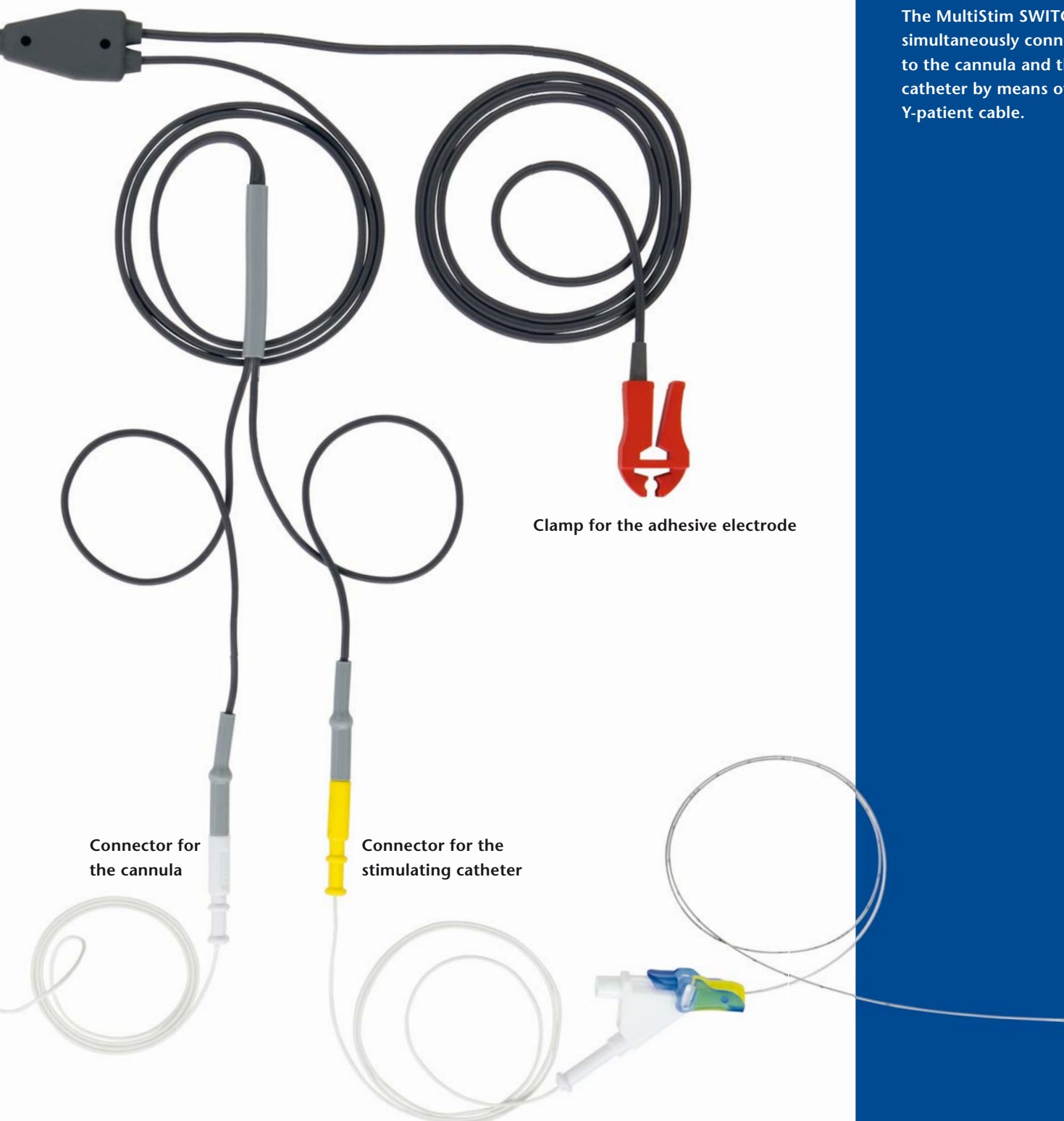
Pulse width





PAJUNK® has set new standards in electrical nerve stimulation, because for the first time ever, it provides the option for alternative stimulation by means of cannula or by stimulating catheter.

The **MultiStim SWITCH** is comparable with the **MultiStim SENSOR** with respect to safety and basic construction, and it has been furthermore provided with additional functional utilities.



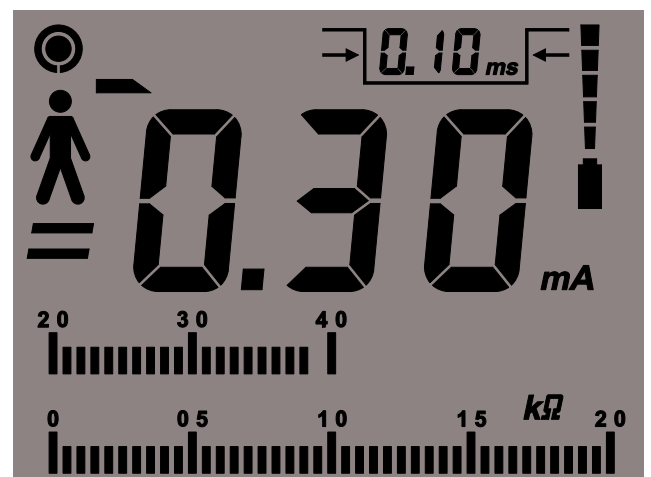
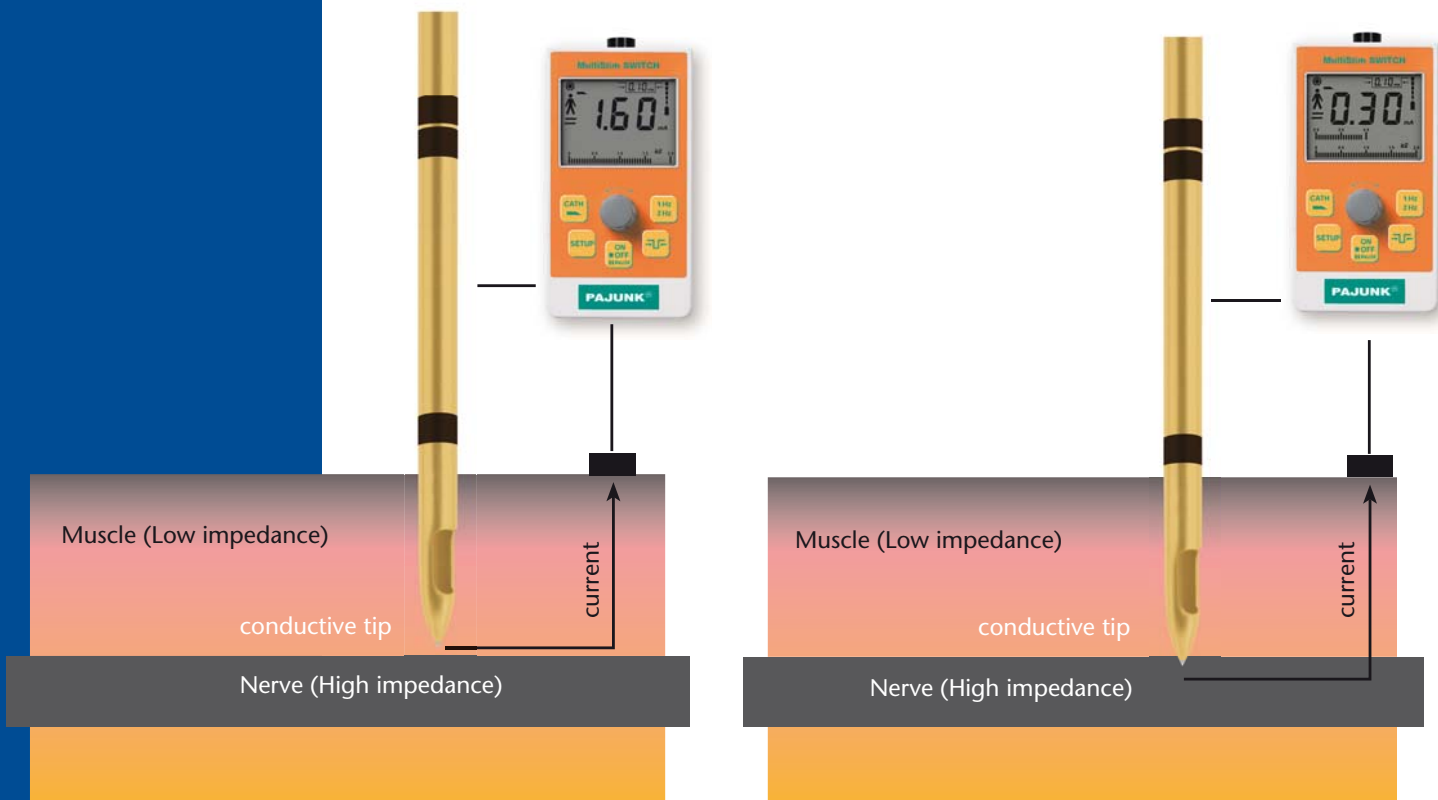
The **MultiStim SWITCH** is simultaneously connected to the cannula and the catheter by means of a Y-patient cable.

## The revolution in the nerve stimulation

# More safety through the indication of patient resistance

The MultiStim SWITCH has revolutionized nerve stimulation. Because MultiStim SWITCH is the first device, which permits the immediate identification and correction of a misplaced cannula, before mechanical or chemical injuries

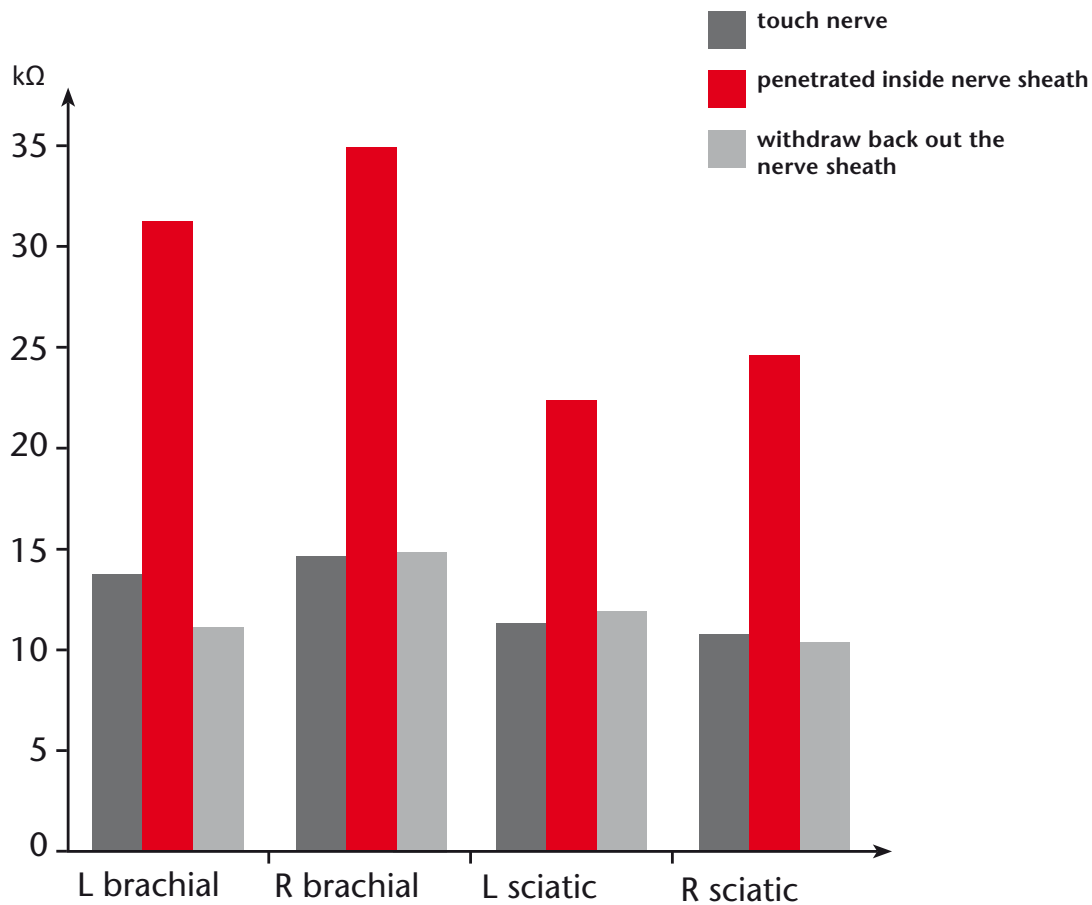
are caused. Because it has been confirmed on the basis of medical studies conducted under the direction of Dr Tsui, that patient resistance will increase distinctly in cases of intraneural, intravascular and intrathecal punctures.





Based on this knowledge, PAJUNK® has enhanced the functional utilities of the **MultiStim SWITCH** by adding a continuous indication of the patient resistance by means of two analogous bar graphs.

The measurement of the resistance connected therewith is only possible, if the highly precise PAJUNK® stimulation cannula are used.



An individual threshold value can be predefined in advance for double safety by means of the SETUP-button, which will cause an acoustic signal to be emitted if the threshold value is exceeded. The **MultiStim SWITCH** therefore provides an essential advantage regarding safety for the patient.



## Useful options

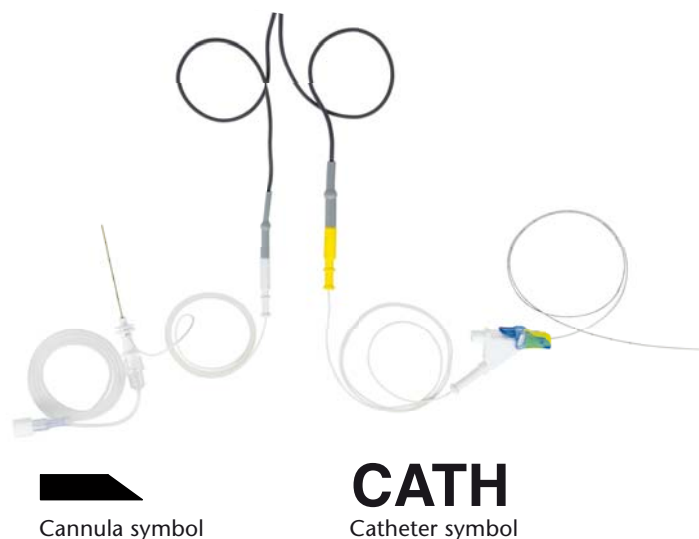
# The MultiStim SWITCH can do more



### Stimulation by cannula or catheter

The MultiStim SWITCH provides two alternative options for stimulation: by way of a cannula or through a stimulating catheter. The corresponding switch-over is actuated simply by pressing the CATH/Cannula – function key.

If stimulation by cannula is activated, then a **cannula symbol** will appear on the display. The maximum stimulation current intensity will be 6 mA.



If stimulation by catheter is activated, then the word "CATH" will appear on the display. In the catheter-mode, the range of stimulation current intensity will be increased to 20 mA, and will therefore correspond with the specific requirements of epidural stimulation.

The intensity and the frequency of the stimulation current, as well as the pulse width can be adjusted and configured separately at any time for both outputs (cannula and catheter).

### Maximum voltage and current intensity

The device emits a stimulation voltage of at most 95 Vpp in order to still obtain a good stimulation effect on patients with high resistance conditions. The intensity of the stimulation current for the catheter amounts to 20 mA for safety reasons, and is therefore also suitable for epidural stimulation.



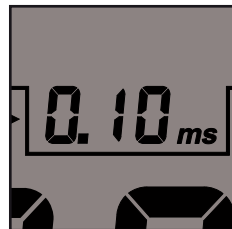
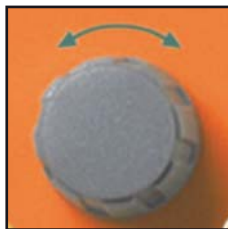


## MultiStim SWITCH

### SETUP-button

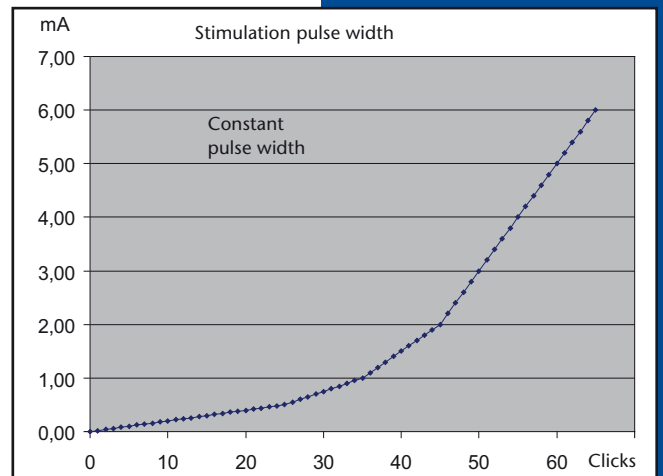
Individual programming options differing from the manufacturer's default settings can be defined by actuation of the SETUP-button.

- Level 1: Volume of the warning- and monitoring sounds
- Level 2: Stimulation frequency, pulse width and current intensity in the "Cannula-mode"
- Level 3: Stimulation frequency, pulse width and current intensity in the "Catheter-mode"
- Level 4: Threshold value, at which the acoustic signal for the patient resistance will change
- Level 5: Activation of the Choquet/Feugeas table; "Cannula-mode"



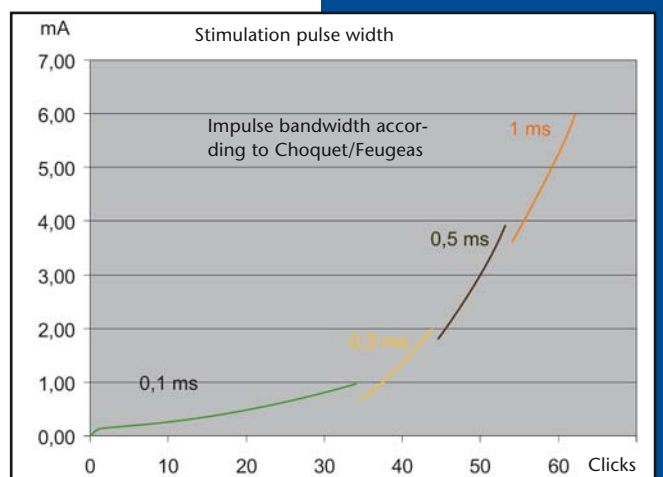
### Individual definition of a constant pulse width

In the manual mode, stored as manufacturer's default setting, the pulse width can be defined by the user. It will remain constant during the complete application. The change of the current values is effected manually in fixed, predefined steps, whereas these steps will be correspondingly large at great distances to the nerve, and will become smaller as the cannula approaches the nerve. (see accompanying table)



### Automatic adjustment of the current intensity and impulse bandwidth according to the Choquet/Feugeas table

In the automatic mode, the pulse width depends on the intensity of the current, and has, on the basis of the Choquet/Feugeas table, been stored permanently in the nerve stimulator. The intention of this method is to achieve a fast, efficient approach to the nerve, on the basis of a constant charge. The device will correspondingly function with a great pulse width at the beginning, which will be reduced according to the intensity of the current in the course of approaching the target nerve. This option ensures, that the anaesthetist can approach the nerve in constant steps under continued muscular response, and can therefore concentrate his full attention completely on the puncture.



# MultiStim SENSOR and MultiStim SWITCH

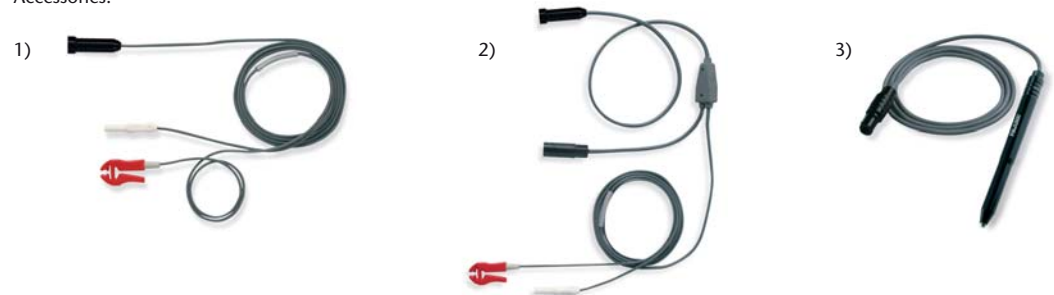
## All the information at a glance



MultiStim SENSOR

### Nerve stimulator: MultiStim SENSOR

Accessories:



MultiStim SENSOR	Item no.
incl. equipment case and patient cables for the connection of stimulation cannula	1151-94-30
incl. equipment case, PEG-cable for the connection of stimulation cannula and monopolar handle	1151-94-32
<b>Accessories</b>	
1) Patient cable for the connection of stimulation cannula	1151-94-13
2) PEG-cable for the connection of stimulation cannula and monopolar handle	1151-94-14
3) PEG-electrode – percutaneous, monopolar stimulation handle, autoclavable	1151-94-17
Extension cord for the connection of stimulation cannula, autoclavable*)	01151-861F
Disposable extension cord for the connection of stimulation cannula, sterile*)	01151-861Q

\*) Usable for SWITCH and SENSOR



MultiStim SWITCH

### Nerve stimulator: MultiStim SWITCH

MultiStim SWITCH	Item no.
incl. equipment case and SWITCH-cables for the connection of cannula and StimuLong catheter	1151-94-40
SWITCH-cabel for the connection of stimulation cannula and stimulating catheter	1151-94-07



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