

An evaluation of the X-Smart™ endodontic motor

Dr John Rhodes evaluates the smart endodontic micromotor, designed specifically to drive nickel titanium rotary instruments



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Qualified from Kings College London in 1990, where he was awarded the Claudius Ash prize in Conservation and the Jose Souyave Endodontic prize. John is registered on the GDC specialist list in endodontics and now runs an endodontic referral practice in Poole, Dorset. He was a council member for the British Endodontic Society. John lectures widely in the UK, runs many endodontic courses and has published textbooks and research papers in several refereed journals. He also contributes to postgraduate endodontic teaching at Guy's Hospital for MSc and MChD Dent students.

The X-Smart endodontic micromotor unit is a small, neat package positively bursting with innovative design excellence and technical wizardry. The control panel fits easily in the palm of the hands yet contains all the elements the clinician would expect from a standard, considerably larger, bench-top motor.

There is a clear LCD screen that is angled for easy visualisation during preparation. It indicates the various settings that have been chosen by the operator: speed, torque, gearing, direction of rotation, program (nine in total), auto reverse setting and gives a realtime read out of the load being applied to the instrument in the form of a graduated bar. There are also battery charge and audible warning indicators.

The handpiece is extremely light and has a removable head that can be sterilised using standard cross-infection protocols. There is a small button that, when depressed quickly, starts the motor rotating, another press and it stops. Alternatively, the operator can press and hold the switch for the duration of operation. Since rotary files should be rotating before being inserted into the canal, it is probably easiest to choose the former. The ability to set the handpiece head at six different angles through 360° makes it easier for the clinician to position the on-off switch within reach, depending on the tooth that is being treated. The X-Smart is available with a foot pedal but within a few minutes practice you do not miss it, indeed it can be quite nice not to have an array of pedals at ones feet while operating.

The head of the handpiece is small and the files can be inserted into the mini chuck simply to engage the latch mechanism. The instrument can be removed by depressing a push-button on the rear.

One of the advantages of using an electric motor to drive nickel titanium files is that torque control can be used, therefore reducing the risk of instrument separation. The torque settings on the X-Smart can be preset, and when the motor senses that 50% load has been reached an alarm sounds, when approaching the torque limit another

alarm sounds. The operator has three choices of how the motor should react if loading continues:

- Auto reverse, in which the motor reverses and when the load is removed returns to normal rotation automatically
- Stop mode, where the file is reversed and, on reduction of load, stops
- Auto reverse off, where the motor simply stops.

Auto reversing is probably the easiest mode to use and with experience gives the clinician added confidence during preparation.

The X-Smart is simple to use, and after a short time practicing on extracted teeth the operator should have gained sufficient confidence to use it on clinical cases. The motor can be programmed for any of the current file-based nickel titanium rotary systems, and torque settings and speed adjusted to suit.

The X-Smart should make the process of mechanical preparation more predictable and enjoyable, providing stress-free endodontics.



Fig 1: The XSmart unit fits neatly into the palm of the hands

Fig 2: The push button activates the motor

Fig 3: There are six positions for the head

Fig 4: The chuck is small for use in confined space such as posterior teeth