Reliable, accurate motion control is critical in large patient scanners

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It takes a strong and sophisticated device to position a patient for a CT scan, but what if that patient has four legs, a long neck, a tail and weighs well over 1,000 pounds? In the world of equine healthcare, getting a large horse into position for accurate imaging is a heavy-duty effort that requires a scanning table that up for the challenge.

The EquusCT from ARTEC IMAGING is a large animal patient positioning and CT scanning table with floating carousel that offers a high degree of maneuverability for veterinarians and veterinary teaching universities practicing equine healthcare.

In order provide smooth, responsive, backlash-free motion to position and move the patient into the CT for scanning, design criteria included the need for highly accurate and repeatable motion, all within a tight budget. The EquusCT uses a NEMA 34 I-Grade controller/driver along with the NEMA 34 I-Grade motor/encoder to enable a horse’s head, neck, front and rear legs to be accurately scanned in any CT

scanner, with 2D and 3D diagnostic image output.

These components drive the equine patient and the supporting carousel in a longitudinal direction into and out of the CT gantry. The combined weight of the patient and the moving carousel is approximately 3,000 lbs. (1,360 kg) and the components – manufactured by Quicksilver Controls –were able drive this combination accurately and effortlessly. The speed ranges from 0.1 mm per second to 75 mm per second a 750:1 speed range - with the same tuning parameters able to operate with or without the patient loaded. The QCI-A34HC1 motor directly drives a lead screw mechanism, eliminating the need for gearheads.

To prepare for an operation, an anesthetized horse, or other large animal patient, is lifted by a hoist and placed on the carousel. The EquusCT table is rolled into the CT suite, centered and anchored over the existing CT table. The patient is moved to the scan position by manually driving the carousel/horse using a manual IN/OUT switch activating the I-Grade motor/encoder. Upon activation of the CT controls for radiation scanning, by the technologist, the Silver Nugget and it's I-Grade motor move the horse so that the selected anatomy longitudinally passes through the x-ray beam. At the completion of the scan, the images are processed by the CT computer and are available for diagnostic study/treatment.
The EquusCT imaging table is currently being used by universities and private equine clinics.

At Texas A & M University the EquusCT is being used with a helical tomographic scanner, providing cancer treatment for the equine population. The Quicksilver components provide a scan speed of 0.4mm per second, allowing precise treatment for the patient with this high energy scanner.

Another use of the Quicksilver components is a computer drive design by ARTEC IMAGING to CT scan dolphins and porpoises at the Woods Hole Oceanographic Institute (WHOI). This technology enables marine biologiststo study their breathing abilities.

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