

HawkEye IV

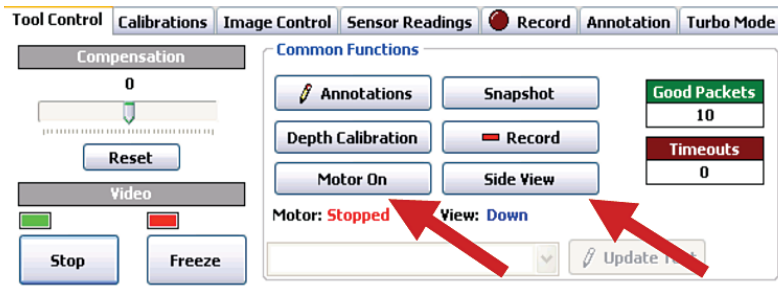
HawkEye IV marks another milestone of achievements for Expro's electric line series of downhole camera systems. Unlike all other down hole cameras, HawkEye IV is unique in that it communicates with the tool via downlink allowing more reliable and easy access to control the camera and electronics in the well. The downlink communication is software initiated by the click of a button and uses packet data transfer. HawkEye IV keeps the tool diameter to 1 11/16", the same as the back light camera, and operates on any single or multi-conductor wireline cable.



The surface box consists of 600V compact power supply controlled by the surface electronics. Power supply limits are set at 350V and 500V to protect downhole electronics in case of damage to the light head or camera. The surface box is light and easy to transport in a carry case.

Hawkeye IV images are captured on the laptop during the survey along with any annotations made to the images. After the job all the images are saved to a CD along with a "job viewer" program to replay the survey. The viewer

program contains a search engine to instantly access images by depth or annotation, eliminating long, arduous searches on video tape. Individual images can easily be emailed from location.



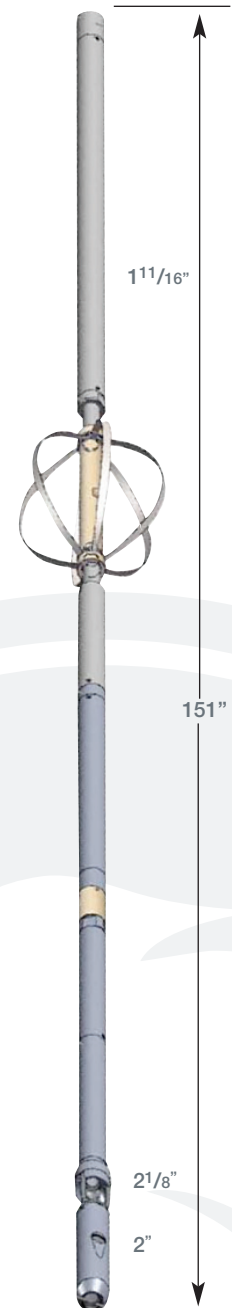
The downlink enables the video operator to easily control the Viewmax light head so that switching from the down/side view, vice versa and/or starting or stopping of motor rotation are accomplished with the click of a button. The recording software makes tool control simple and reliable.

Applications:

- Fluid Entry survey on electric line
- Fluid movement
- Fishing Aid
- Casing Inspection
- Splits/Parts
- Collapse
- Perf Inspection
- Scale
- Corrosion
- Leak detection
- Obstruction
- Restriction
- Windows
- Laterals
- Gas Lift Valves
- SCSSV Valves
- Fractures
- Liner tops

Features:

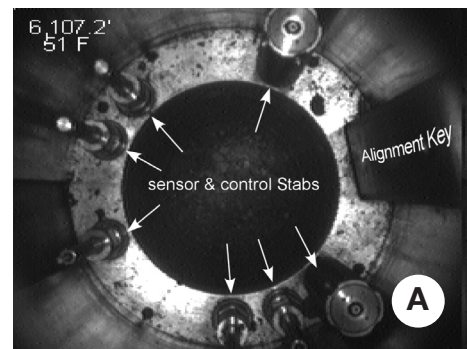
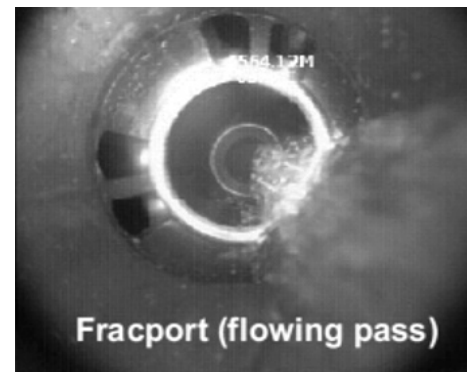
- Downlink communication
- Software control of Viewmax motor and camera
- Turbo/ burst mode to record full motion video
- Unlimited turbo recordings in one trip down the well
- 500V power supply
- Power supply limits to protect tool at 350V and 500V
- Enhanced user friendly software
- Compatible with Back light, Ring light, Viewmax light head



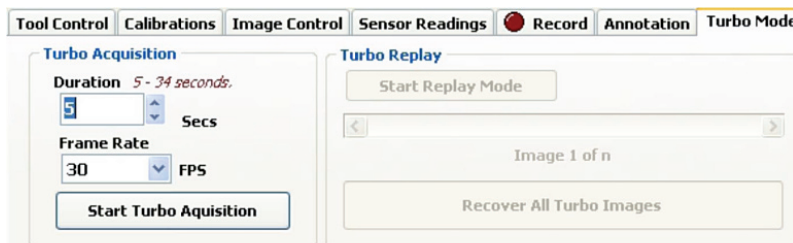
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One prominent enhancement is the 'turbo mode' (burst mode) option that commands the tool to increase its frame acquisition rate from 1fps to as fast as 30fps (full motion video) by storing these images in the tool and then transmitting batches of images to the surface. As many as 1020 images can be stored in the tool. These higher acquisition rates are particularly well suited for moving fluids such as pinpointing fluid type and entry location or understanding flow regimes to enhance understanding of production logs in horizontal wells. The operator can run as many turbo recordings as required with the tool downhole, eliminating the need for recovering the tool to surface and trip time up and down the well.

Turbo mode activation is enabled simply by entering the acquisition frame rate and duration of the recording. Turbo images can be replayed on the recorder software or downloaded to a surface PC for viewing on Proview. Turbo recordings are highlighted in red in the Proview's job log. These can be played back for review, annotated and published as any normal HawkEye survey.



The image shows the shoulder free of debris and was used to align the connection before latching (see photo A)



Technical Specifications:

Tool O.D.	1 11/16" (43mm)
Length	102" (259cm)
Length (with Viewmax)	151" (384cm)
Weight	31lbs (14kg)
Max. temperature	257°F (125°C)
Max. pressure	10,000 psi (69 MPa) (15,000 psi with high pressure kit)
Material type	17-4H1025
Frame rate	1.0fps (Normal mode), Up to 30fps (Turbo mode)
Turbo/ burst mode	Record from 3.75fps to 30fps, 1020 frames
Power supply	500V power supply
Deployment	Electric Line (Single or Multi-conductor)
Compatible light heads	Back Light, Ring Light, Viewmax

Benefits:

- One trip in the well to obtain multiple fluid entry passes
- Highly portable/mobile downhole camera
- View images while logging; updated every second
- Operates on conventional electric line cable
- Interactive control to search for images
- Survey horizontal wells (CT or tractor)
- Survey wells with H₂S or CO₂
- View mechanical problems
- View fluid movement