Is there a free viewer for our data files?

Yes, install the TD-Scan software *without* a license (or dongle) and it allows the user to view any data with limited analysis functionality. TD places no restriction on the distribution of its TD-Scan software.

I can't collect data with the dongle plugged in

1. Dongles are *only* used for data analysis.
2. *Never* plug a dongle into a TD system. Only ever plug a dongle into a remote PC or laptop that is not connected to a TD system.
3. Analysis is also part of the TD licence so any licenced system (temporary or permanent) can be used for this purpose without a dongle.
4. If a dongle is plugged into a TD system that has an active **temporary licence**, the temporary licence will be deactivated, however a warning message will appear with a choice to proceed with or abort software startup.

What are the steps to achieve a successful inspection?

1. **Establish a** *Scan Plan*. Use ESBeamTool™ to define in a graphical environment the test piece geometry, transducer & wedge variables, beam characteristics, offsets, gates etc.
2. **Hardware & Software Setup**. Import the setup from the ESBeamTool™ workbench file (.ebwk).
3. **Calibration & Amplitude Correction**. Use the **Calibration Wizard** to establish:
    1. 'Per focal law' calibration then
    2. 'Per focal law' time corrected gain (TCG).
4. **Scanner Setup**. Select, configure and calibrate the required scanner & encoder.
5. **Data Collection**.
6. **Data Analysis**.

Can I test composites with TD equipment?

Yes, with the optimal probes and setup our systems are well suited to these materials. Some users prefer to view 2 C-Scans of the same scan area simultaneously, one displaying amplitude data and the other displaying depth data. In **Super-View** define 2 **Main Panels** with the appropriate data presentation and link the cursors for both panels.

Phased Array

How to speed up Phased array data collection?

First the user must understand that when doing phased array and displaying the data as BCD&S scans, the computer processor is being highly stressed because there is so much calculation to be done. Therefore you need to be aware of this and apply practices that will limit the stress on the processor - this is true for all phased array systems. Here are a few tips:

1. Enable Online Max speed in «**Setup - Configuration – Misc**». This will display the C-Scan as a non-volume corrected view during data collection. When the file is opened for analysis the view will automatically be corrected and displayed as a true depth C-scan – this saves lots of processor power.
2. (**TD Handy-Scan only**) **Enable Data Limits (Samples)** in «**Setup – Configuration – Misc.**» and choose 150, 300 or 600 samples (300 is probably best). This will limit the amount of displayed data samples to a maximum of the chosen value regardless of what the digitization frequency is set to. This control frees up the processor significantly and dramatically increases the speed at which you can scan. Data Limits(Samples) will reduce the displayed data resolution (but probably within an acceptable range - please check procedure requirement).
3. Display as little data on the screen during data collection as possible – perhaps only a C'scan and an A-scan and then change this to a more complex view when off line for data analysis.
4. Keep the gate to the minimum required.
5. Be mindful of the amount of focal laws being generated and keep these to a minimum – the more focal laws, the more the processor has to work.
6. Increase the PRF.
7. Switch image filtering off during data collection – this will be done automatically if **Online Max Speed** is used.
8. Do not set the digitization frequency too high – it is usual to use 5 times the probe frequency for PA and 100Mhz for ToFD. The digitization frequency may be lowered with acceptable results but be mindful of the code requirements.
9. Do not use averaging for PA, it is usually only needed for ToFD.

Is the PA calibration 'per focal law'?

1. Only if the Calibration wizard is used. This is sometimes referred to as *experimental* calibration.
2. Manual calibration may be carried out on one (lowest) focal law and the theoretical values for the other focal laws calculated automatically or at the click of a button the entire calibration may be fully automatic. This is sometimes referred to as *theoretical* calibration.

ToFD

I am trying to do a ToFD scan. However, when I start the scan the screen doesn't look familiar. There is a colour selector on the right hand side of the screen and the scan axis aren't what I was expecting.

This is because the system is in "**Super-view**" mode. To correct this, end the scan. Go to the **Setup** menu item and select **Configuration**. Select the **Misc** tab, and de-select the **Use TD-superview** option. Attempt the scan again.

What is the thinnest material that can be tested with ToFD?

That depends on several factors; (a)the frequency of the probes: the higher the frequency, the thinner the material that can be scanned effectively. (b)It also depends on what portion of the material is important for analysis, e.g. if only the root of a 6mm thick steel weld is of interest then with 15Mhz probes approximately the lower 3mm of material can be analysed effectively which includes the root (provided it is not misaligned). In any case the requirements of the code should be adhered to or at least a performance test carried out on a flawed reference sample.

Can I do ToFD and Phased Array simultaneously?

Yes. Set up the ToFD and Phased array on separate channels. SuperView should then be configured with 2 **Main Panels**, one for ToFD with only a D-Scan Sub-Panel and the other for Phased Array with any Sub-Panels that are needed.

Why is the Handy-Scan so noisy in ToFD mode?

Actually it is not. The handy-Scan's A-scan has much higher amplitude for a given gain than the other TD systems so appears noisier. The solution is to use lower gain thereby lowering the noise spikes.

Pulse Echo

Can I do Pulse echo and Phased array simultaneously?

Yes, however there are some considerations as to whether it is actually practical.

1. Pulse Echo requires a raster action to scan a volume of material at an angle however a straight line scan is almost always used in Phased array. The mechanics of using both scan types simulaneously are too difficult to be useful. At any rate the PA is doing the same as the PE in this case.
2. Occasionally a pair of Creep Wave probes is deployed to scan the weld toes for surface breaking cracks. This scan does not require a raster action and therefore fits well with a simultaneous Phased array scan.

Corrosion Mapping

Can I do CM with Phased array?

Yes, you can use either SuperView or the Corrosion Mapping software. In Superview, when a single channel performing an electronic scan at 0 degrees is set up, data storage is optimized for 1 value per scan position which makes the scan files much smaller for this type of inspection and scan speed is greatly improved.

Can I use Video tracking with Phased array?

Yes. Place the LED or target at the centre of the array & keep the array in the same orientation throughout the scan to maintain positional integrity, i.e. do _not_ swivel the probe.

Can I join individual files together?

Yes: different files may be joined in the Corrosion Mapping software but not in SuperView.

Scanners & Encoders

Can I use an automated scanner with TD equipment?

1. Yes. However, the the TD system capability will determine whether you control the scanner directly from the TD system or whether an external drive control system is required.

Focus-Scan	TD-Scan	Handy-Scan	Pocket-Scan
Yes	Yes	External drive	External drive

Can I use stepper motors directly from TD systems?

No, our systems only support servo motors.

What are the power requirements for the motors?

1. 24 Volts
2. Peak = 4Amps
3. Continuous = 2Amps.

What encoders are supported?

1. Quadrature(TTL) encoders are supported. Either optical or magnetic may be used.
2. Potentiometers are not supported.

How many movement axis do TD systems support?

Two, X & Y

Does TD manufacture scanners?

Generally speaking, no. We do however have close associations with several of the worlds leading scanner manufacturers and supply these items to customers that use our equipment. The exceptions are the *Video Tracking Scanner* system that we assemble and the *Slide Arm Scanner*, a manually propelled ToFD/Phased array scanner.

Probes & Wedges

Can I use curved wedges with TD phased array systems?

Wedges curved in the passive plain may be used however, curvature in the active plain is not supported. There is one exception for wedges (or arrays) curved in the active plain: if the sound is normal to the scan surface (i.e. 0°) there is no beam steering, therefore using a relatively small aperture for an electronic scan, a perfectly reasonable scan can be achieved.

What is the meaning of 55° when describing a Phased array wedge when it can be used at multiple angles?

The angular descriptor is the natural angle at which sound will be refracted into steel using that wedge with no beam steering. Other angles are also available. In phased array, a beam can effectively be steered approximately 15° in either direction from the wedge's natural angle, therefore the angular designator may be used as a guide to determine the most effective angular range for the wedge.

Does TD manufacture probes and wedges?

No. We do however sell a range of TD branded probes and wedges to customers that use our equipment.