T-Scan Interface

Hardware Setup

This Quick-start guide can be used for the initial setup of the Leica T-Scan5 system for operation within SA in conjunction with either an AT960 or AT901.

- Set up the unit following the manufacturer's directions. The AT960 users the MCA-47 cable between the T-Scan and Tracker controller's signal port (the trigger port is not used). The AT901 uses the MCA-36 cable which has a dual end for the tracker signal line and trigger connections . A single network cable should be connected from the computer to the t-scan controller and a second Ethernet cable connects the tracker and t-scan system along with a signal cable (Figure 14-82).

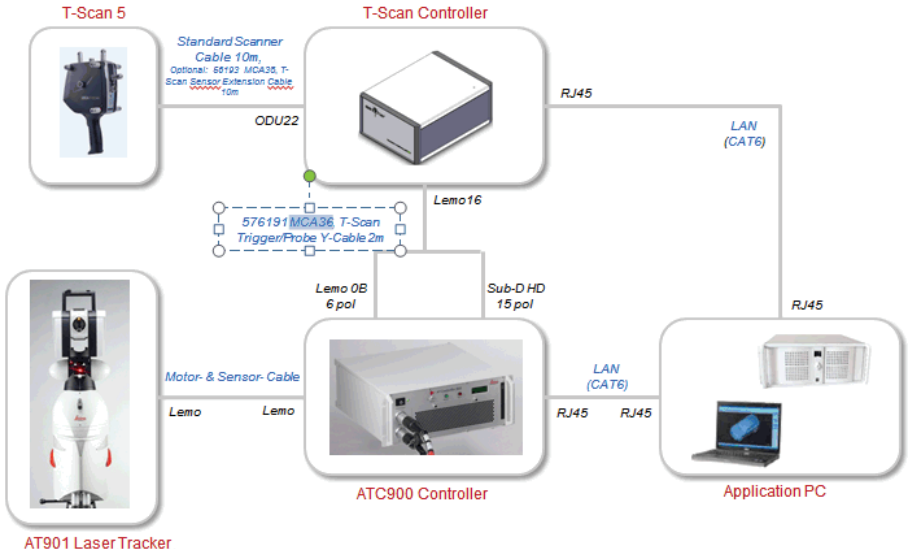


Figure 14-82. AT901 Cable Configuration

- Ensure that you have the T-Scan License key to operate the sys-

tem.

- Ensure that you have the USB drive containing the *.mtx and *.emsys files (calibration files) which should also contain the Leica setup manuals and a version of the required software (T-Scan Collect or T-Scan Interface and TwinCat Engineering).

Tracker Configuration

The T-Scan target definition must be defined on the tracker controller. The procedure to do so depends on the tracker type:

- AT960 Configuration:

1. Open Tracker Pilot, and connect to the AT960 using the "Advanced" permissions (if you need the current Tracker Pilot you can browse directly to http://192.168.0.1 (or the trackers IP) and download Tracker Pilot from the controller).
2. Go to targets and ensure the T-Scan is defined. If not use the Import Targets button and browse to the *.emsys file for the t-scan provided on the USB disk.
3. Once defined Exit Tracker Pilot.

- AT901 Configuration:

1. Open the Emscon TransferTool, enter the tracker IP and press Test.
2. In the Transfer to emScon section press Parameter File and browse to the *.emsys file for the t-scan provided on the USB disk.
3. Save and Exit

Software Setup and Initial configuration

Directory Setup:

1. Determine if you have a license key for either the T-Scan Interface or the full T-Scan Collect Software (Either one or the other should be installed as require but not both), and install the correct one on your machine.
2. Transfer the *.mtx files from the USB drive to the T-Scan directory. T-Scan looks for the files in a particular spot (C:\ProgramData\Steinbichler\T-SCAN\Calibration) you will need to build the Calibration directory and place the files in this folder.

TScanCol.ini Edit Process:

1. Within the C:\ProgramData\Steinbichler\T-SCAN\T-SCAN Interface 10.30\ folder (or T-Scan Collect 10.3 folder) you will find a file called "TScanCol.ini". Open and edit this file as follows (it's a long file so scroll through it to the correct section):
2. Verify the Specific IP address of your tracker (192.168.0.1 by

default)

3. Enter the TrackerInterfaceType (EMSCON for AT901 or LMF for AT960)
4. Enter the ScannerAlignmentBaseName (such as LLS1100271). This number is on the front of the T-Scan.
5. Enter the AMSNETID for the T-Scan Controller. Which should be printed on the front of the controller (Such as 5.29.142.116.1.1)
6. Once complete save and close the TScanCol.ini file (see Figure 14-83).

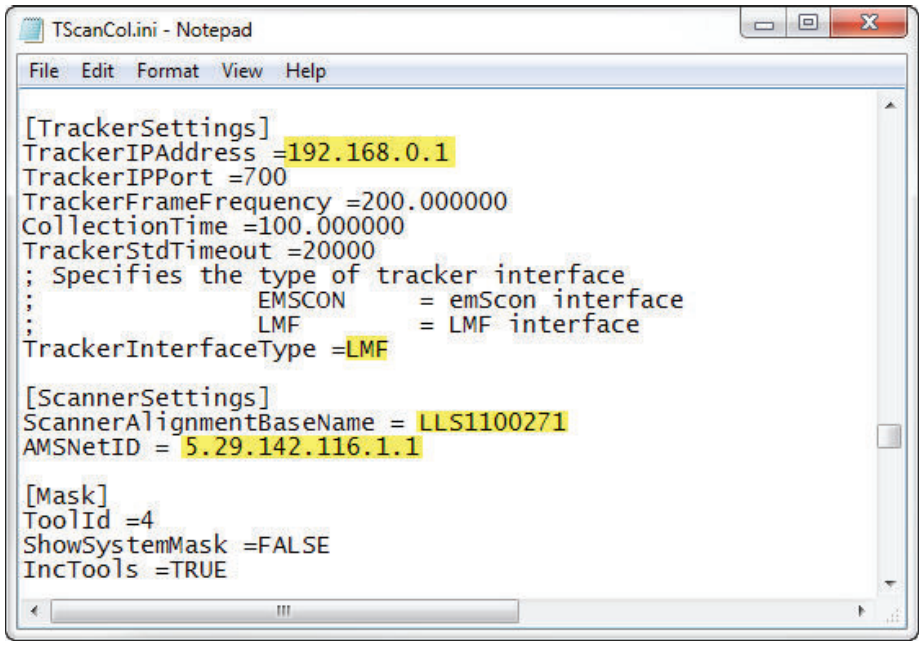


Figure 14-83. TScanCol.ini file

Network Configuration:

1. Configure your local area network connection as follows:
2. Go to Control Panel> Network and Internet> Network and Sharing Center
3. Open the Local Area Network Connection properties (ensure the cable is connected to the T-Scan Controller if you don't see it)
4. Go to the properties for the Internet Protocol Version 4 (TCP/IPv4)
5. Set the IP address to use the following IP: 10.168.2.2XX (enter 201-250 only) and subnet 255.255.255.0.
6. Press Advanced and add a second IP (for the tracker). Enter 192.168.0.XXX (enter 2-250 for the IP), again using 255.255.255.0 for the subnet mask(see Figure 14-84).

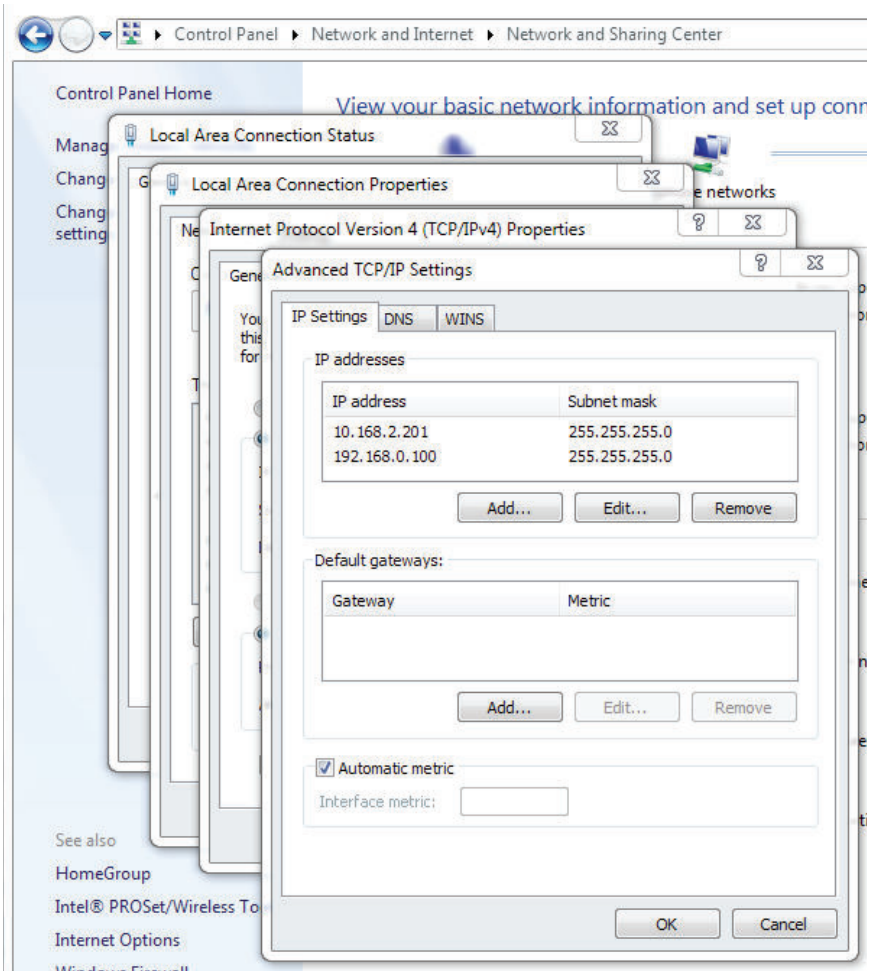
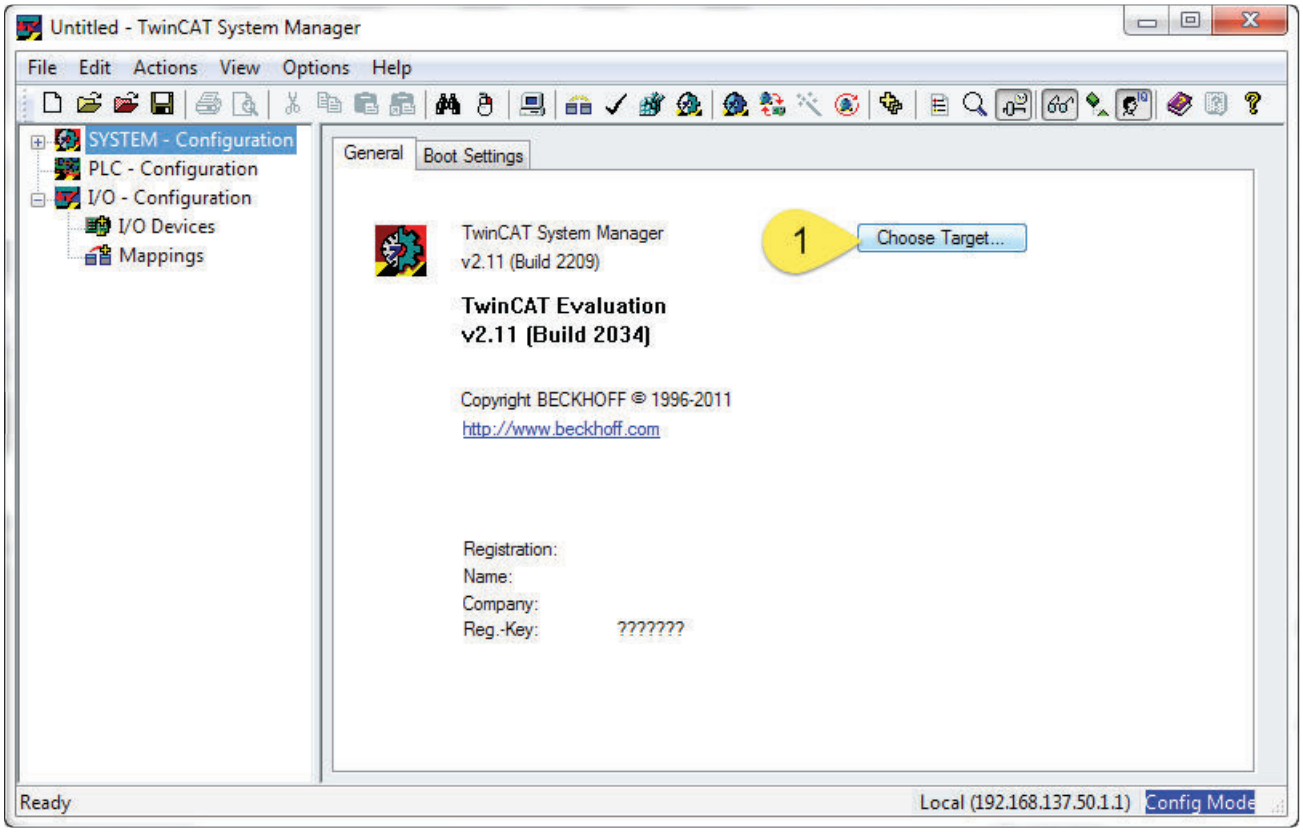


Figure 14-84. Network Configuration settings

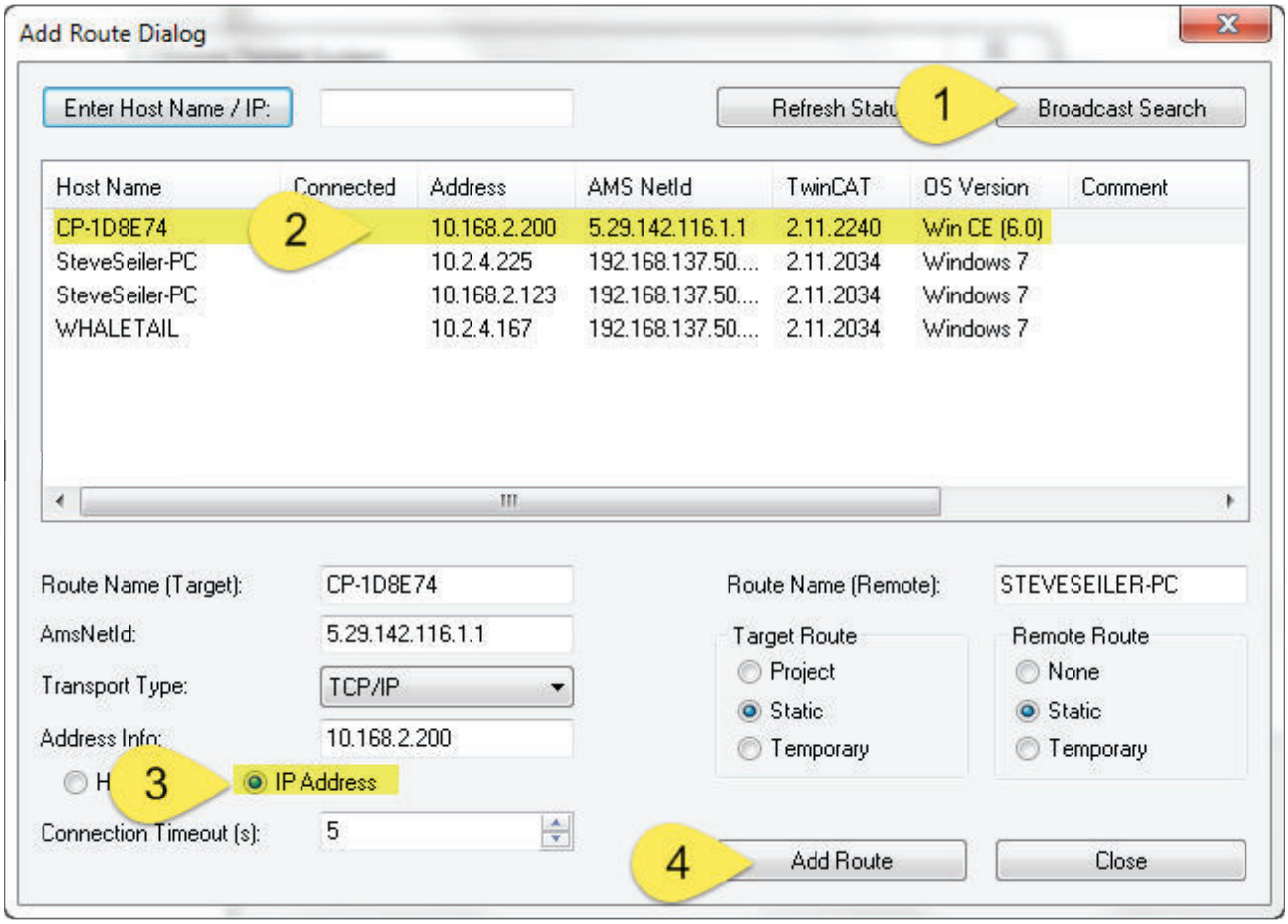
7. Click OK and close out of all dialogs and exit out of the network Sharing Center when done.

TwinCAT Software:

1. Install the TwinCAT Engineering Software (which will manage the dual network communication between the tracker and the T-SCAN system). This software should be available on your USB drive and will be called "Tc211x64Engineering_2110_2209.exe" or something similar.
2. From the Windows task bar launch the TwinCAT System Manager and configure it to talk to the T-Scan Controller.
3. Select Choose Target(see Figure 14-85):



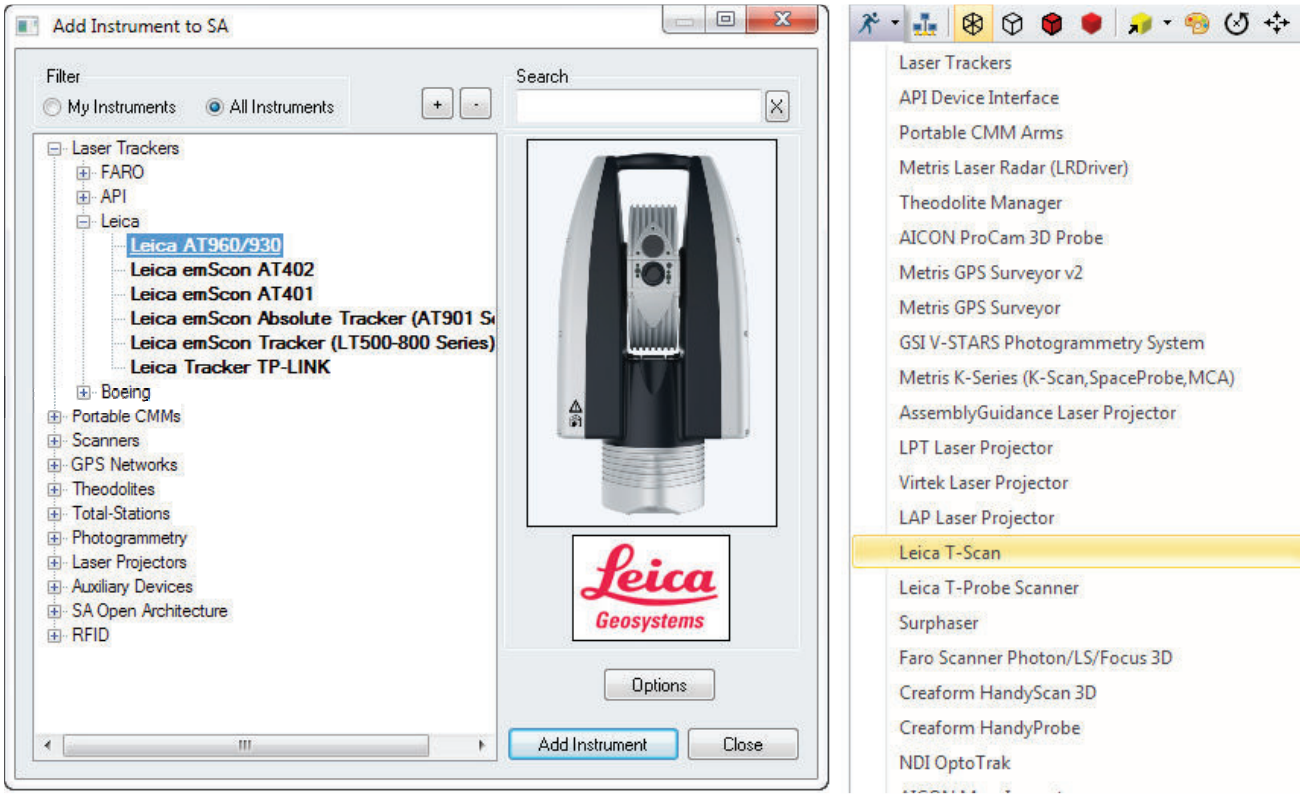
4. Perform a Broadcast Search and look for the AMS NetID of the controller which should show up on the network list. When it does, select it and set it to use IP Address as follows(see Figure 14-86):



5. You can tell you have a successful connection to both the T-Scan Controller and the Tracker once you see the Status indicator in the bottom right of the TwinCAT software report a green connected status. At that point you can close out of TwinCAT.

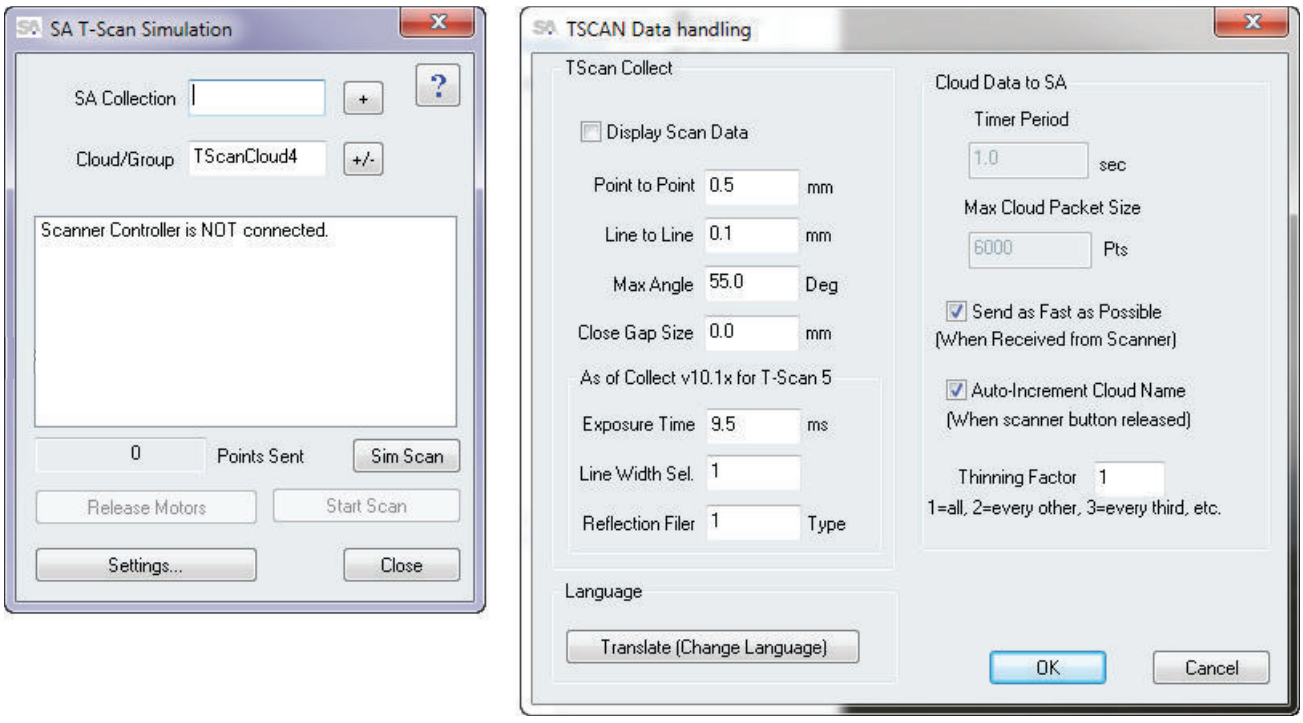
Running the T-Scan Interface in SA:

1. Add the Instrument (Instrument>Add…) and choose the appropriate Leica Tracker (AT901 or AT960)
2. Start the Interface through the menu Instrument>Run Interface Module and choose Leica TScan. (Do not connect using the Laser Tracker Interface) (see Figure 14-87):



T-Scan Interface in SA:

When you start the Leica T-Scan interface it will automatically connect to either T-Scan Collect or the T-Scan Interface which will run in the background. The T-Scan interface in SA is designed to be as simple as possible while providing full control (see Figure 14-88):



- Collection and Cloud Name control is provided and a new cloud name will be incremented automatically with each separate scan.
- A progress report will be displayed in the connection window
- T-Scan control is provided through the Settings button. Control for both the TS50 and the new Tscan5 is available in sections in the left hand column, the following Tscan5 controls are provided:
- **Exposure Time can be set manually from 0.25 to 20.0 milliseconds**
- **Line Width Set can be set from 0-12 (0=100%, 12=40%).** This reduces the width of the line as you increase the integer value (set as an integer for scripting purposes).
- **Reflection Filter intensity setting (1 = Standard, 2 = Low, 3 = Medium, 4 = High).** Again this value is set as a simple integer for easy scripting control.

T-Scan MP Controls SA:

- **Start Instrument Interface.** – Argument 3 controls the allowable interface types. Include 0 (laser tracker), 1 (Leica Automation Interface Control interface), or 2 (Leica T-Scan).
- **Instrument Operational Check –**
- **Select Device T-Scan.** – Set AIC Device Selection to T-Scan
- **Select Tracker #** - Set AIC Tracker #, Jump SA Instrument to designated Collection::Instrument Index (set in AIC Driver), Connect and Start Interface to T-Scan or emScon based on current MUX and AIC Device Selection.
- **Increment Group/Cloud Name** – Increment the current Group/Cloud Name by 1.
- **Release Motors** – Releases motors if there is a current emScon or T-Scan connection.
- **Is Laser Locked** – Returns success if the beam is locked. Status window will indicate the kind of target the laser is locked onto.
- **Set Scan Point to Point Distance** – T-Scan Point to Point Distance Control
- **Set Scan Line to Line Distance** – T-Scan Line to Line Distance Control
- **Set Scan Maximum Angle of Incidence** – T-Scan Maximum Angle Control in Degrees
- **Set Scan Exposure Time []** – Set the scanner expose to a value from 0.25-20.0ms.

- **Set Scan Width Iteration []**- Sets the width of the scan line as a reduction factor from 0-12 (where 0=100% and 12=40% of the full scan width)
- **Set Scan Reflection Filter []** – Sets the reflection filter type from 1-4 (1=Standard, 2=low, 3=Medium, 4=High)
- **Close Scan Gaps Up To []** – Tells T-Scan collect to close gaps in scan data to the specified mm distance. Enter 0 to not close gaps.
- **Scanner Power On** – Turn T-Scan On
- **Scanner Power Off**– Turn T-Scan Off
- **Set Instrument Group and Target** – The Group name is used as the Cloud Name when using the T-Scan
- **Measure** – Causes the T-Scan to start scanning.
- **Stop Active Measurement Mode** – Causes the T-Scan to Stop Scanning.

Leica Automation Interface

Hardware Setup

Before starting the AIC driver, it's necessary to ensure that all hardware connections are complete:

- The AT-901 tracker controllers should be connected to the AIC hardware.
- The auxiliary device (T-Mac, T-Probe, external trigger, etc.) should be connected to the AIC hardware.
- The AIC hardware should be directly connected to the computer on which the interface will be run.

Starting the AIC Driver Manually

1. First, add up to four Leica AT-901 trackers to the SA job.
2. From the appropriate SA folder in the Windows Start Menu, navigate to Interfaces and select Leica Automation Interface (Figure 14-89).

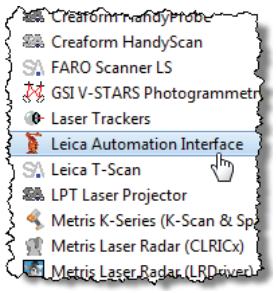


Figure 14-89. Starting the Leica Automation Interface.

3. In the ***Connect*** dialog, select the tracker you'd like to connect to (Figure 14-90).