

QUICK START GUIDE

TACHPAK® 10 & 30
TACHTROL® 10 & 30
TACHTROL® plus

TACHLINK® WINDOWS / PC APPLICATION

ATTENTION!!!
IMPORTANT DOCUMENT
DO NOT TOSS
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AI-TEK INSTRUMENTS, LLC
www.aitekinstruments.com

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AI-TEK Tachometer Quick Start Guide

This guide is intended to provide an overview of some of the most important operational steps in getting started with this instrument. See manual (on TACHLINK disk) and TACHLINK Installation Guide for detailed instructions.

Programming via TACHLINK (TACHTROL or TACHPAK 10 & 30)

1. Install TACHLINK onto PC running Windows 2000 or XP prior to connecting tachometer.
2. Once inserted, the CD should automatically load TACHLINK. If not, click **START > RUN**: Type "X:\Setup.exe". Replace "X" with appropriate drive.
3. Load Microsoft® .NET 1.1 Framework, first, if not already installed. Re-start PC and finish TACHLINK installation.
4. Connect tachometer to PC via USB or RS485 for programming and power and as applicable for application, input signal(s), relay, analog output. (see attached connection chart)
5. If PC does not automatically install USB drivers complete New Hardware Wizard described in TACHLINK Installation Guide.
6. In TACHLINK under the **MAIN** tab select appropriate **Comm. Port** from **Program** menu (typically **USB**).
7. After changes are made, be sure to return to the **MAIN** tab and answer **YES** if you wish to save changes.

Programming via front panel (TACHTROL or TACHPAK 10 & 30 - using a TACHTROL^{plus})

1. Connect tachometer to power and as applicable for application, input signal(s), relay, analog output. (see attached connection chart)
2. Front panel operation is similar to a cell phone function and navigation keys.
3. Press **F1 (MAIN) > Change Tach** to access Input, Relay and Analog Output configuration related menus
4. Press **F2 (Security)** for security related menus.
5. After changes are made, be sure to return to the **MAIN** screen and answer yes if you wish to save changes.
6. Customize front panel display under **F1 (MAIN) > Change Tach > Display/Keypad**.
7. If display reads "Display Offline" ensure **Display Address** is not **0** (1-8 is good) under **F2 (Security)**.
8. After changes are made press **F1** to return to **MAIN** and answer **YES** if you wish to save changes.

Programming Tips

1. Use starter **Databases** to turn unwanted functions off. On any tab *except* **MAIN**, select **Program** then **Database Open. (optional)**
2. Save user-configured **Databases** to PC. On any tab *except* **MAIN**, select **Program** then **Database Save.**
3. Constants can be entered in standard numeric form and will be converted to exponential notation by hitting **TAB** after entry.
4. Do not use zeros in constant entries. Calculations based on zero are not reliable. Use 1.000e-003.
5. Front panel programming for many of the user-defined constants is in exponential notation.
6. No need to fill in all fields, the instrument comes with defaults in all parameters. Simply adjust those specific and necessary to your own application. See Below

Digital Input / Input

7. Set **Logic Levels (Logic Low / Logic High)** appropriate to sensor, typically 20% and 80% of positive side of sensor waveform. Defaults will cover almost all active sensors and many passive sensors. Passive sensors may require changes with low speeds and / or large air gaps.
8. **Min Frequency** defaults from the factory at 0.100 Hz and equates to a 10 second period where the tachometer waits to decide the signal has reached zero.
9. **Normalization** is a number that when multiplied by the incoming sensor frequency allows the tachometer to calculate and react to units that are important to the user. **Normalization = 60 / Number of teeth on target.** Example: Calculate RPM with a 60 tooth gear, **Normalization = 60/60 = 1.**
10. For example above: **Units = "RPM"**
11. Once **Normalization** and **Units** are entered, all speed related constants for relays and analog output are entered in the calculated units (ex. RPM).
12. **Min frequency x Normalization = the lowest speed the tachometer interprets.** For example, if the AO has been scaled to reach 0 mA's at .01Hz, and the product of **Min frequency x Normalization = 0.5 Hz**, there will be residual current being driven in the AO loop (proportional to 0.5Hz) and the display will also read 0.5Hz even as the actual speed drops below 0.5 Hz. This effect becomes more significant as Min frequency x Normalization increases.

Digital Output / Relay Output

13. Select desired **Output (D1, D2, R1, R2) & Source (A, B, Equation, Off)**. Turn unwanted outputs off with **Source = Off**
14. Enter **Safe (Off)** and **Alarm (On)** set points.
15. Enter relay behavior; Energize Above, Energize Below, De-Energize Above, De-Energize Below
16. **Loss of tachometer power during operation is interpreted as an alarm state and must be RESET when power is restored.**
Reset can be accomplished in a number of ways:
 - Cycle speed through **Alarm (On)** and **Safe (Off)** hysteresis band.
 - Under **Security** tab / menu click on **Alarm Reset (TACHLINK or front panel)**.
 - Connect a logic pulse from switch, relay or other source to **Reset** input terminals.

Analog Output Setup

17. Select **Source, Range, Min. Value / Max. Value.**

Security

18. Use for **Alarm Hold-Off, Keyboard Lock, Security Code** and **Alarm Reset.**

Verify / Diagnostics

19. Use to verify tachometer function without committing to the actual application.

Analog Output Calibration (TACHLINK only)

20. **DO NOT START UNLESS YOU WISH TO CALIBRATE!!! CLICKING ON "START" WIPES OUT ALL AO CALIBRATION CONSTANTS!!! IF YOU START YOU MUST FINISH!!! REFER TO MANUAL**

Plotting (TACHLINK only)

21. Use for acquiring, recording and analyzing tachometer process related data in an SPC type format.

TACHLINK® Installation Guide

Loading AI-TEK TACHLINK Onto Windows 2000 or XP.

1. Load onto your pc prior to connecting with either USB or RS485. Close all unnecessary applications.
2. Once inserted, the CD should automatically load the installation. If not, click **START** then **RUN**. Type "X:\Setup.exe" (replace "X" with the correct drive letter for the applicable CD-ROM drive, typically D). Follow the on-screen instructions to complete the installation.
3. If your pc does not have Microsoft® .NET 1.1 Framework, it will install first. Follow the on-screen instructions to complete the installation. When complete, restart the computer and log in if necessary. TACHLINK will now install. Follow the on-screen instructions.
4. When complete AI-TEK TACHLINK and manual icon will appear on your desktop. All starter databases are loaded.
5. Connect power to tachometer, then connect USB.
6. **Found New Hardware Wizard** will start:
 - a. Select **NO** if asked to allow connection to Windows Update. > Click **NEXT**
 - b. Insert Installation /Disk > Select **Install Automatically** > Click **NEXT**
 - c. If **Logo Compatibility** notice appears, select **Continue Anyway**.
 - d. System should find USB driver file. If not, the following dialog box will appear:
[Insert the CD labeled "FTDI FTD2XX Drivers Disk" into your CD ROM]
 - e. Insert CD > Click **OK**
 - f. System should find USB driver file. If not, the following dialog box will appear:
[The file'FTD2XX.sys' on FTDI FTD2XX Drivers Disk is needed]
 - g. Click **BROWSE** > X:\program files\Aitek\Tachlink\USB Device Driver\FTD2XX
 - h. Highlight file "FTD2XX" > click **OPEN**.
 - i. The following dialog box will once again appear:
[The file'FTD2XX.sys' on FTDI FTD2XX Drivers Disk is needed]
 - j. Click **OK**.
 - k. Click **FINISH** to complete **Found New Hardware Wizard**.
7. Launch TACHLINK and select Program > COMM Port and either USB or applicable COMM port to establish communication per section 4.2.1.2 of manual. Make wiring connections per section 3.5 (USB) or section 3.6 (RS485). A dialog box may appear when TACHLINK is first launched:
Couldn't open .cfg file. Click **OK**, the file is generated when first opened.

TACHOMETER CONNECTION CHART

TACHOMETER CONNECTION CHART					
		TACHTROL 10 & 30		TACHPAK 10 & 30	
	Function	Terminal	Description	Terminal	Description
Power Connections	DC				
	Positive (+)	TB7, pin 1	12-30 Volt In	TB3, pin 14	12-30 Volt In
	Negative (-)	TB7, pin 2**	In GND	TB3, pin 13**	In GND
	AC				
	Hot	TB4, pin 3	AC Hot	TB8, pin 27	AC Hot
	Neutral	TB4, pin 4	AC Neutral	TB8, pin 28	AC Neutral
	Earth	TB4, pin 1 <u>or</u> 2	AC Earth Gnd	TB8, pin 25	AC Earth Gnd
	DC & AC	Both can be connected simultaneously			
Sensor Connections	Passive				
	Wire 1	TB9, pin 2 <u>or</u> 3	A Sig <u>or</u> B Sig	TB1, pin 2 <u>or</u> 3	A Sig <u>or</u> B Sig
	Wire 2	TB9, pin 1	Input Com	TB1, pin 1	Input Com
	Cable Shield	TB4, pin 1 <u>or</u> 2	AC Earth Gnd	TB8, pin 25	AC Earth Gnd
	Active (single channel)				
	Power	TB7, pin 3 *	+12 Vdc Out	TB3, pin 15 *	+12 Vdc Out
{	TB7, pin 4*	Out GND	TB3, pin 16 *	Out GND	
Ground{	-common with-	-common with-	-common with-	-common with-	
{	TB9, pin 1	Input Com	TB1, pin 1	Input Com	
Output	TB9, pin 2 <u>or</u> 3	A Sig <u>or</u> B Sig	TB1, pin 2 <u>or</u> 3	A Sig <u>or</u> B Sig	
Cable Shield	TB4, pin 1 <u>or</u> 2	AC Earth Gnd	TB8, pin 25	AC Earth Gnd	
Active (dual channel)					
Power	TB7, pin 3 *	+12 Vdc Out	TB3, pin 15 *	+12 Vdc Out	
{	TB7, pin 4*	Out GND	TB3, pin 16 *	Out GND	
Ground{	-common with-	-common with-	-common with-	-common with-	
{	TB9, pin 1	Input Com	TB1, pin 1	Input Com	
Output 1 (A)	TB9, pin 2	A Sig	TB1, pin 2	A Sig	
Output 2 (B)	TB9, pin 3	B Sig	TB1, pin 3	B Sig	
Direction	TB9, pin 4	Direction Input	TB1, pin 4	Direction Input	
Cable Shield	TB4, pin 1 <u>or</u> 2	AC Earth Gnd	TB8, pin 25	AC Earth Gnd	
External Function	Verify				
	3.5 – 30 Vdc > switch > 	TB8, pin 2	Verify +	TB2, pin 6	Verify +
	>>>>>>>>> Ground >	TB8, pin 1	Verify -	TB2, pin 5	Verify -
	Reset				
3.5 – 30 Vdc > switch > 	TB8, pin 4	Reset +	TB2, pin 8	Reset +	
>>>>>>>>> Ground >	TB8, pin 3	Reset -	TB2, pin 7	Reset -	

Troubleshooting Guide

	Problem Description	Resolution
1	Tachometer is not recognized by computer when connected via USB	USB drivers not installed. Under Control panel > Add Hardware > start Add New Hardware Wizard > follow prompts and TACHLINK Installation Guide found in shipping carton.
2	Tachometer will not communicate with TACHLINK	See item 1. Also check under Control panel > Add or Remove Software . Make sure Microsoft® .NET 1.1 Framework is installed. Multiple versions may cause TACHLINK communication problems. Consult your IT department.
3	Tachometer loses communication through TACHLINK after power loss.	Re-establish link by re-launching TACHLINK or return to Program menu and re-select appropriate Comm. Port from Program menu.
4	TACHTROL display reads "Display is Offline"	From front panel Security (F2) > Display Address > set to any number other than 0.
5	Program Changes not saved.	Return to Main tab / Main screen and answer YES if you wish to save changes. Changes to constants may need to be re-entered.
6	After power is lost or cycled off/on relays do not reflect correct state.	See programming tip #16.
7.	Analog output does not change with speed, is "stuck" at full scale or is behaving erratically.	See programming tip #20. Recalibrate in TACHLINK > Analog Output Calibration > Start . Consult manual.
8	Analog output shows some value of output after speed has dropped below AO minimum value.	See programming tip #12. If Normalization must be a large number, select Min Frequency to be as small as possible. Attempt recalibration per Troubleshooting step # 7.