T-Series Datasheet

High performance multifunction DAQ with USB, Ethernet, and WiFi.

This datasheet covers all T-series variants:

- **T4**
- **T4-OEM**
- **T7**
- **T7-OEM**
- **T7-PRO**
- **T7-PRO-OEM**
- **T8**

These pages form the complete datasheet, manual, and user's guide for the T4, T7 and T8. Most information in this datasheet applies to all T4 and T7 variants as well as the T8. Information about WiFi only applies to the T7-Pro variants and the high-resolution ADC (ResolutionIndex = 9-12) applies to the T7-Pro variants in addition to the T8. There is an OEM section with information specific to the build of OEM versions.





Product Name: LabJack T7 (-Pro)
Model Number: LJT7 (-Pro)

Product Name: LabJack T8

Model Number: LJT8

conform to the following Product Specifications:

EMC Directive: 2004/104/EEC

EN 55011 Class A
EN 61326-1: General Requirements

and is marked with CE

RoHS2:

The T4, T8 and T7 (-Pro) are RoHS compliant to Directive 2011/65/EU of the European Parliament on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

REACH:

The T4, T8 and T7 (-Pro) are REACH compliant. REACH Product Compliance Program has been implemented in accordance with Regulation No. 1907/2006 of the European Parliament and the Council of 18 December 2006. LabJack Corporation does not currently have a direct REACH obligation to pre-register substances. LabJack's REACH Product Compliance is determined by a certification from our supply chain. LabJack products are deemed to be REACH compliant when they do not contain Substances of Very High Concern (SVHCs) beyond the specified concentration limits of less than 0.1% by weight as outlined in REACH 1907/2006/EU regulation.

CFM:

LabJack Corporation does not knowingly use these minerals or any by-products, as specified by the Conflict Minerals Trade Act.

Compliance Information for the WiFi module in the T7-Pro and T7-Pro-OEM

FCC:

Contains FCC ID: T9J-RN171
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Canada:

Contains transmitter module IC: 6514A-RN171

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain

octet, and adding decimal points as necessary. The result in this case would be "192.168.0.171".

Write IP Example: To change the Wireless IP Address of a device, perform a Modbus write to address 49250. The IP address must be passed as an unsigned 32-bit number, such as 3232235691. Change this IP address "192.168.0.171" by converting each octet to a binary group, and sticking them together.

Antenna Details

The T7-Pro ships with a very common RP-SMA 2.4 GHz antenna similar to the W1030 or A24-HASM-450 from Digikey, or search Amazon for "rp-sma" to find plenty of options. To put an antenna further away from the T7-Pro you can use any standard male-female RP-SMA WiFi extension cable.

The connection to the WiFi module on the T7-Pro PCB is made via a snap-on/snap-off ultra miniature coaxial connector called male U.FL (aka AMC, IPEX, IPAX, IPX, MHF, UMC or UMCC). The normal T7-Pro uses a U.FL to bulkhead RP-SMA cable with a length of 140mm, similar to the Taoglas Limited CAB.622, Emerson 415-0100-150, Laird 1300-00041, Amphenol 336306-14-0150, or Amphenol 336306-12-0150.

To search for U.FL to RP-SMA cable options at Digi-Key, go to the "Cable Assemblies => Coaxial Cables (RF)" section, and filter by Style = "RP-SMA to IPX" or "RP-SMA to MHF1" or "RP-SMA to UMC" or "RP-SMA to UMCC". Then look at the picture and make sure it looks correct, as the application of the terms "male" and "female" are not totally standardized.

T7-Pro-OEM ships with a simple 30mm U.FL whip antenna such as the Anaren 66089-2406.

WiFi Range

Base T7 Antenna

The WiFi range on the T7 is typical for a modern WiFi device. In direct line-of-sight with the router, it's possible to get a decent connection at 100m. The table below shows signal strength at varying distances with a stock T7 antenna, and a simple WiFi router. Both the T7 and the router were positioned 3ft off of the ground, with direct line-of-sight.

Distance	RSSI
10m	-44dBm
25m	-45dBm