

## - Key Features -

- Wideband Coverage
- Low Insertion-Loss
- Front OLED Display
- High Dynamic Range
- Consistent Attenuation Steps
- Programmable via USB virtual COM port
- Ultra Compact
- Affordable & Reliable
- Audio Feedback
- Ethernet Connected
- USB Powered
- Intuitive & Reliable



# DAT Series

## Programmable Digital Microwave Attenuators



### DAT64L, DAT90L, DAT64F, DAT64H, DAT60KUL, DAT306K

The DAT Series of devices are designed as a complete high-performance family of programmable digital microwave attenuators providing a host of powerful features. With a focus on an intuitive user experience, and quality manufacturing, the DAT Series provides users with a versatile solution for many RF projects and applications. DS Instruments currently manufactures wideband models from 5MHz to 30GHz, all in compact USB-powered configurations. Ethernet is standard on the DAT60KUL and DAT306K, and optional on all other models.

### Stand-Alone Controls

The DAT Series devices set themselves apart from others in the industry by providing a display and buttons in addition to traditional remote operation. This stand-alone control combined with USB serial commands, and Ethernet interface make the DAT Series devices flexible and convenient for field use, or a permanent setup in an automated test environment.

### DAT Applications

- Electronic warfare
- Automated testing environments
- General RF lab use
- Control systems
- Satellite communications
- Line-of-sight links
- Production verification
- Educational / university lab use
- Aerospace / defense research
- Wireless infrastructure
- Radar systems
- Phased array applications

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# DAT Series Attenuators

## Device Images



- Both SMA ports on the rear



- 90dB high dynamic range
- 3-inch long case



- 0.25dB fine step size



- 13GHz X-band model



- 22GHz Ku-band model
- Ethernet standard



- 30GHz 2.92mm connectors
- Ethernet standard



# DAT Series Attenuators

## Models Compared

|  | DAT64L | DAT64F  | DAT90L | DAT64H | DAT60KUL | DAT306K |  |
|--|--------|---------|--------|--------|----------|---------|--|
| <b>Frequency Range (GHz)</b>           | 0.05-6 | 0.1-6.0 | 0.05-6 | 0.1-13 | 1-22     | 1-30    |  |
| <b>Attenuation Range (dB)</b>          | 0-63   | 0-63    | 0-90   | 0-63   | 0-60     | 0-60    |  |
| <b>Insertion Loss - typical (dB)</b>   | 5.0    | 4.0     | 7.0    | 8.0    | 8.0      | 10.0    |  |
| <b>Step Size (dB)</b>                  | 0.5    | 0.25    | 0.5    | 0.5    | 0.5      | 0.5     |  |
| <b>Max Input – Hot Switching (dBm)</b> | +25    | +25     | +25    | +23    | +25      | +25     |  |
| <b>Max Input – Steady State (dBm)</b>  | +25    | +25     | +25    | +25    | +28      | +28     |  |
| <b>Return Loss - typical (dB)</b>      | 13.0   | 15.0    | 13.0   | 12.0   | 10.0     | 8.0     |  |
| <b>0.1 dB Compression</b>              | +33    | +30     | +33    | +23    | +27      | +27     |  |
| <b>RF Connectors</b>                   | SMA    | SMA     | SMA    | SMA    | SMA      | 2.92mm  |  |
| <b>Standard Ethernet</b>               |        |         |        |        | X        | X       |  |

# DAT Series Attenuators

## Shared Specifications

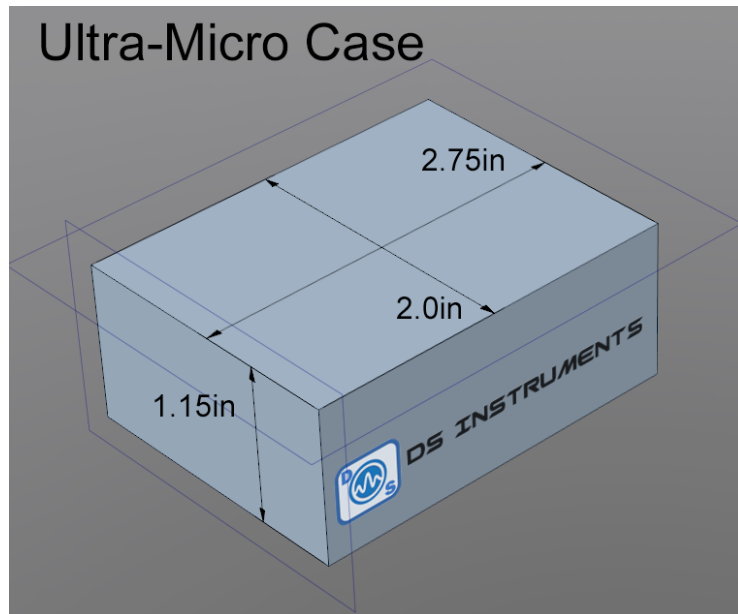
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| Parameter                                     | Min  | Max  | Typ           | Units |
|---|------|------|---------------|-------|
| Temperature Range (OLED)                      | 0    | 50   | <b>25</b>     | C     |
| Temperature Range (USB/Ethernet only version) | -30  | 60   | <b>25</b>     | C     |
| Switching Speed (OLED & buzzer enabled)       |      |      | <b>35</b>     | mS    |
| Switching Speed (USB only)                    |      |      | <b>&lt;1</b>  | mS    |
| DC Voltage Input - Micro USB Port             | 4.50 | 5.30 | <b>5.0</b>    | VDC   |
| Device Current Requirement (USB 5V)           |      | 400  | <b>250</b>    | mA    |
| Device Mass                                   |      |      | <b>150</b>    | G     |
| Case Length                                   |      |      | <b>2</b>      | Inch  |
| Virtual COM Speed                             |      |      | <b>115200</b> | bps   |

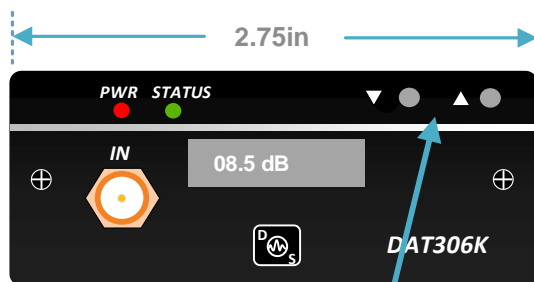
Detailed specifications can be found in each independent device datasheet.

# DAT Series Attenuators

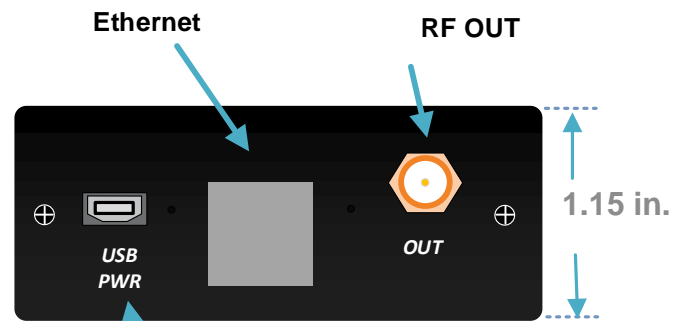
## Mechanical Information



**CASE DIMENSIONS:**  
1.15(H)x2.75(W)x2.15(L) in.



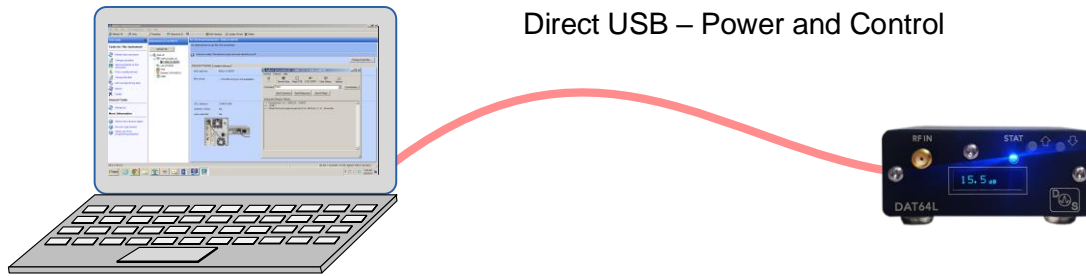
User Interface  
Control Buttons



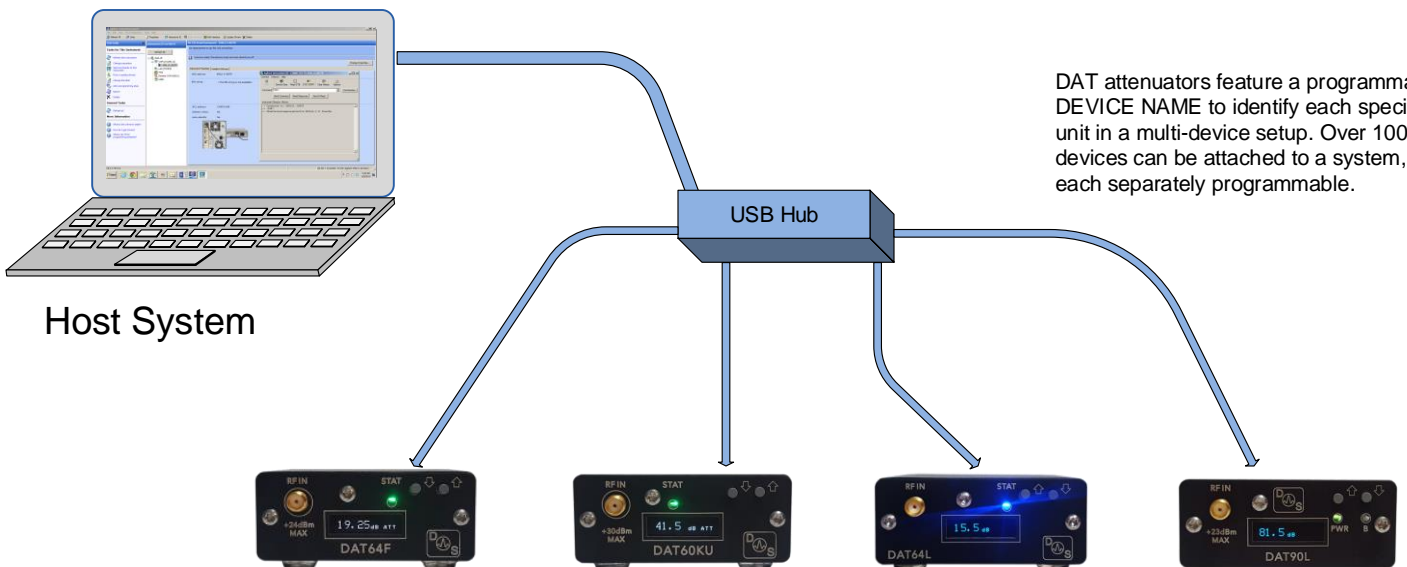
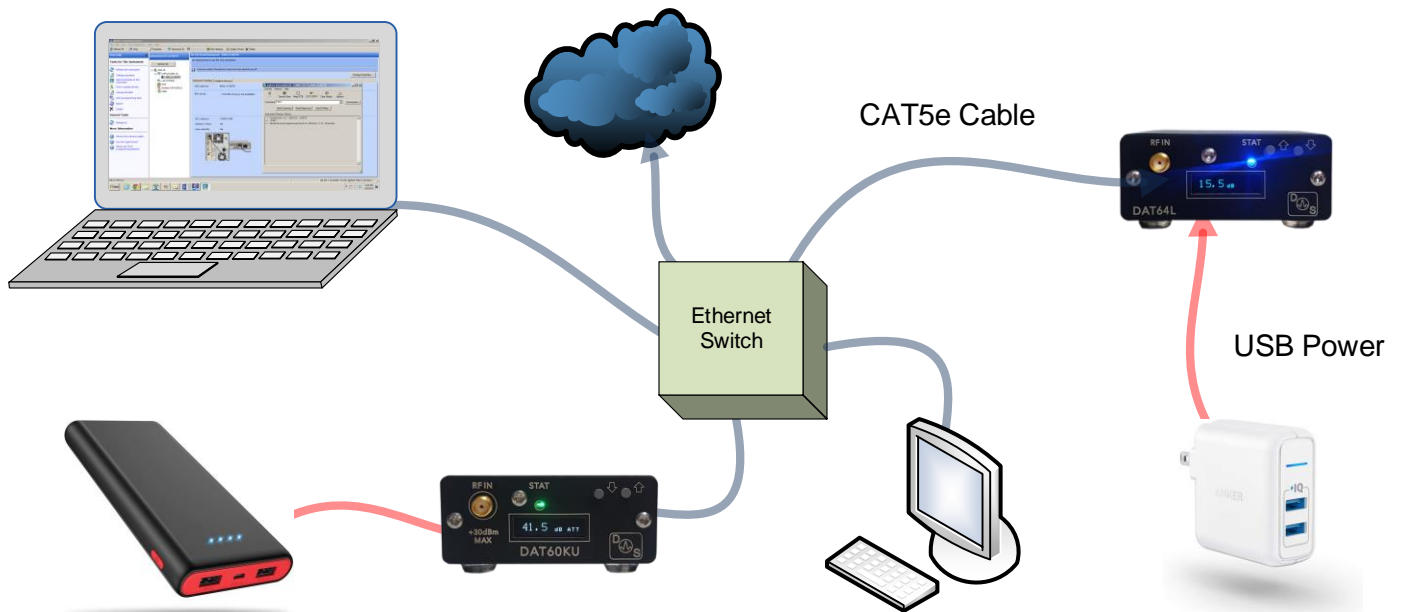
Micro USB Interface to PC  
and DC Power Input

# DAT Series Attenuators

## Remote Operation Configurations



Host System



# DAT Series Attenuators

## USB COM Port SCPI Commands

|                |  |
|----------------|--|
| *IDN?          | - Return standard identification string      |
| ATT 12.0       | - Shorthand command for INPUT:ATT            |
| ATT?           | - Return current attenuation setting         |
| *UNITNAME TomJ | - Set a custom nickname for this unit        |
| *UNITNAME ?    | - Return user set device nickname            |
| *BUZZER OFF    | - Turn off audio beeps – lower response time |
| *DISPLAY OFF   | - Disable OLED display – lower response time |
| *RST           | - Reset device                               |

(115200 Baud)

Full command lists available separately

## Windows GUI – Digital Attenuator Control

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Digital Attenuator Control

COM91

DAT90L - SER:114 - FW:7.32

90RED-6

Quick dB Setting

0 10 20 30 40 50 60 70 80 90

Set Attenuation (dB)

- 80.50 +

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PONG!

Download our lightweight and easy-to-use control software for PC at our website!

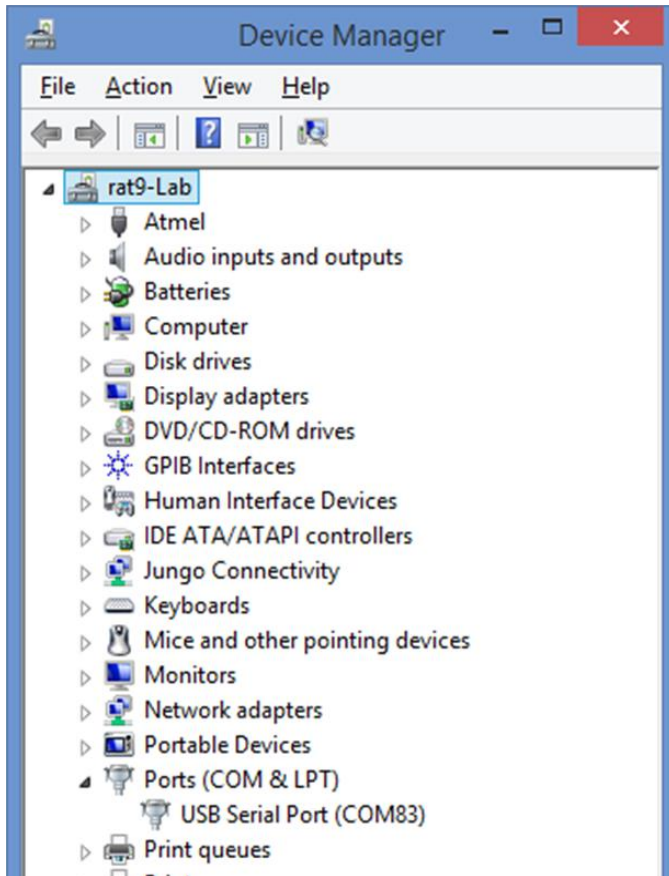
Our instruments ship with DHCP enabled by default, STATIC IP is supported, and can be configured via the web interface using a standard internet browser.

Our control software will display any IP address it finds that belong to a DSI device in the COM port list.

# DAT Series Attenuators

## USB COM Port Connection

All of our products can be controlled from any serial-capable programming language or environment. No extra drivers are required. MATLAB, .NET, Linux, python are all popular. We use Visual Studio 2022 and C# for our standard GUI. First determine the port number that your device has installed itself as:



Command terminator is LINEFEED ("\n")

**COM Port Settings:**  
115200bps, 8bits, 1 stop, no parity, no flow control

## Example Code (C# .NET Framework):

```
using System;
using System.IO.Ports;    // include serial port library

SerialPort myPort = new SerialPort("COM83", 115200, System.IO.Ports.Parity.None, 8, System.IO.Ports.StopBits.One);
myPort.Open();           // open the port we just made
myPort.WriteLine("*IDN?"); // send any command here
myPort.ReadTimeout = 250;
string myResponse = myPort.ReadLine(); // read back the response
System.Threading.Thread.Sleep(30);     // delay before sending the next command
```

# DAT Series Attenuators

## Ordering

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**DAT64 – No display version of DAT64L (USB only)**

**DAT64L – Standard model (Display & USB)**

**DAT64E – No display version of DAT64L with Ethernet**

**DAT64LE – Add Ethernet to standard model**

**DAT64F – Standard model (Display & USB)**

**DAT64FE - Add Ethernet to standard model**

**DAT90L - Standard model (Display & USB)**

**DAT90LE – Add Ethernet to standard model**

**DAT64H - Standard model (Display & USB)**

**DAT64HE - Add Ethernet to standard model**

**DAT60KUL – Standard Display and Ethernet**

**DAT306K – Standard Display and Ethernet**

## *Contact Information*

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