

## UltraFED

### 30 MHz Far End Device



#### Key Features

- Test frequencies from 300 Hz up to 30 MHz
- Improved test process
- Through mode testing
- Dual pair testing
- Remote power on
- Powers on using field-replaceable 9-volt battery and AC adapter for extended use inside CO/exchange

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The UltraFED is a far end device (FED) designed for service providers pre-qualifying and troubleshooting copper circuits that carry high-bandwidth services. The device addresses the need to test copper frequencies up to 30 MHz. As very high bit-rate digital subscriber line 2 (VDSL2) is introduced to the market and asymmetrical digital subscriber Line 2+ (ADSL2+) continues to grow, service providers require a FED to turn up and troubleshoot networks with “one man out”—in the past, two high-end test instruments (like the HST-3000) operated by two technicians at each end of the circuit were required for VDSL pre-qualification and troubleshooting. Using the UltraFED and an HST-3000, only one technician is needed.

As broadband service speeds escalate there is an ever-increasing strain on the copper circuit. Before deploying VDSL (and ADSL2+), service providers typically pre-qualify different circuit types ranging in length and wire gauge to verify circuit records and determine if the central office (CO)/exchange can support VDSL deployment. In addition, once deployments begin, special service technicians troubleshoot copper circuits when VDSL deployments have failed. The combination of these two methods of testing improves high-speed broadband deployment.

The JDSU UltraFED, with the ability to test copper frequencies up to 30 MHz by a single technician, helps field teams maximize resources by addressing the specific test challenges associated with the pre-qualification and troubleshooting of VDSL and ADSL2+ networks.

The UltraFED is easy to use with single-pushbutton operation and a light-emitting diode (LED) display. The pushbutton is used to place the UltraFED into different test states and the LED will indicate which state the unit is currently in. A diagram showing the various states of the UltraFED is also displayed on the front of the unit, allowing the user to easily determine the test state by matching the pattern seen on the LED with the diagram.

### UltraFED Test States

The UltraFED can be used in three different test states: off, on, and trace.

#### Off State

“Off” is the powered-down state. In this state, all circuits are open and the unit is in Through mode (between the primary pair and CO pair). The unit draws just enough power to keep the wakeup circuitry active. Everything else in the unit is powered off, including the LED. The UltraFED will only respond to a wakeup signal or key press in the off state. The UltraFED can be left plugged into an electrical source at the CO/exchange for extended testing without draining the battery.

The pushbutton must be pressed once to get to the off state from other states.

#### On State

From the off state the pushbutton is pressed once to enter the “on” state. In the on state, the unit is active and responds to commands sent by an HST-3000. This state supports all UltraFED test functions. The LED flashes once per second to indicate that the unit is in the on state. Once in this state the UltraFED has a four-hour timeout and when the pushbutton is pressed and released, the unit will go into the off state.

#### Trace State

When the pushbutton is pressed twice within one second the unit will enter the trace state. In this state, the unit is powered up and the trace tone is transmitted across the primary pair to help locate the pair at the other end. The LED flashes once every two seconds to indicate the trace state is active. Once in this state, if the pushbutton is pressed and released the unit will go into the off state. The HST-3000 can override this state and interact with the UltraFED using the wake up signal. This ensures that the engineer at the far location connects and tests the right pair.

### UltraFED Test Modes

#### All Open Mode

In All Open mode, the primary and secondary tip (A), ring (B) and ground (sleeve) are disconnected from the cable pairs under test. The All Open mode is used to isolate the pair(s) under test to the UltraFED.

#### Through Mode

In Through mode, the primary tip (A) and ring (B) are connected to the CO tip (A) and ring (B), so testing may occur beyond the UltraFED. Through mode is the UltraFED default mode.

#### Strap Mode

The Strap mode connects tip (A) to ring (B). The most common use in Strap mode will be loop resistance measurement. Strap mode may also be used to aid in resistive fault location (RFL) measurements.

**Spectral Tones Mode**

The Spectral Tones mode sends a complex tone across tip (A) to ring (B). Spectral tones are used for loss testing the line. The spectral tones can also be used when measuring crosstalk.

**Spectral Balance Mode**

The Spectral Balance mode connects the complex tone from tip (A) to ring (B) to ground. Spectral Balance mode is used by the test set to assess the balance of the line in the xDSL frequency range.

**Trace Mode**

The Trace mode connects the trace tone generator across tip (A) to ring (B). Trace mode is used to help a technician find the pair under test in a bundle of cables.

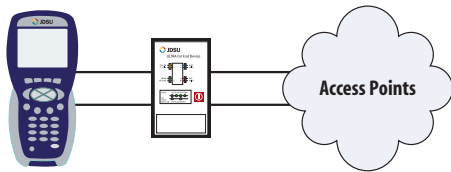


Figure 1. Through Mode Testing

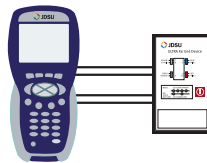


Figure 2. Dual Pair Testing

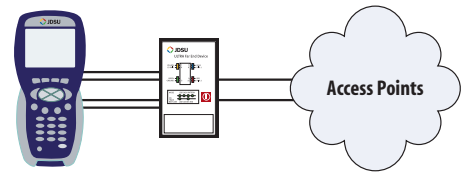


Figure 3. Dual Pair Testing with Through Mode

**Tip/Ring to Ground Strap Mode**

The Tip/Ring to Ground Strap mode connects the UltraFED tip (A), ring (B) and ground to the ground of the cable. The most common use by the field test set in this mode is during resistive balance measurement.

**Single Tone Mode**

The Single Tone mode connects a tone generator across tip (A) to ring (B). Single tone mode is used by the test set to measure loss.

**Three Way Strap Mode**

The Three Way Strap tip mode, a type of testing which uses dual pair testing, connects the primary tip (A) to the secondary tip (A) to ring (B). This mode is used primarily for RFL measurement with a known good pair.

**Quiet Terminations Mode**

Quiet Terminations mode is used to properly terminate a pair at the FED end.

**Additional Features****UltraFED ID**

Each UltraFED has a unique ID that can be communicated to the test unit and displayed to the user in order to verify that they are working with the intended device.

**Battery level**

The battery state (good, low, very low) is communicated to the HST-3000 so that it can be displayed.

**Trace Tones**

When the UltraFED is in Trace mode, it will alternate between a 577 Hz tone and a 1004 Hz tone.



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**Specifications**


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**Size**

Approximately 6 in [152 mm] x 4 in [101 mm] x 1.5 in [38 mm]

**Weight**

Approximately 8 ounces with battery

**Battery life**

Approximately 20 hours of continuous use

**Battery shelf life**

2 months installed (20 hours of continuous use)

**Operating temperature range**

0°F (-18°C) to 140°F (60°C)

**Storage temperature range**

-40°F (-40°C) to 165°F (75°C)

**Humidity range**

10%-95% RH non-condensing

**Tone transmit**

 300 Hz to 30 MHz  $\pm 0.015\%$  @ 0 dBm

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**FREQUENCY RANGE**


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VOICEBAND [POTS]

300 Hz – 20 kHz

 600  $\Omega$ 

WIDEBAND [XDSL]

10K Hz – 30 MHz

 124  $\Omega$ 


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**Ordering Information**


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**Part Number**

UltraFED

**Description**

FED with test capability up to 30 MHz

The UltraFED will ship standard with two accessories: a protective cloth case and an 8 pin mod to seven clip lead cable. The AC adapter (optional) attaches to the UltraFED at the top of the unit. Also at the top of the unit is an 8 pin mod connection for the test cable. The test cable has seven leads. The seven leads are necessary to allow the UltraFED to perform dual pair testing and Through mode testing.

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