

Field Technician Quick-Reference Checklist

Field Service & Verification Form | Lead Specialist: Kadeem Manning | Instrument: FLS Transmission Line System (HP3588B VNA / TFH Coupling)

Technician Name:	Kadeem Manning	Date / Time:	____ / ____ / 2026
Station / Location:	_____	Unit Serial #:	_____ _____
Weather Conditions:	Temp: ____ °C RH: ____ %	Target BAC / Permittivity:	_____ _____

Step / Item	Procedure & Acceptance Criteria	Target Range	Pass / Fail
1. High-Voltage Safety	Verify TFH capacity post isolation & master earth ground connection.	Chassis Ground < 1 Ω	[] Pass [] Fail
2. TFH Visual Check	Inspect coupling post insulator for tracking, cracks, or environmental debris.	Clean / Clean Insulator	[] Pass [] Fail
3. Instrument Warm-Up	Power on HP3588B VNA and HP35677A test set for thermal stabilization.	Warm-up ≥ 20 Min	[] Pass [] Fail
4. Frequency Band Setup	Program VNA sweep from 50 kHz to 500 kHz with 100 Hz IF bandwidth.	50–500 kHz / 100 Hz IF	[] Pass [] Fail
5. Signal Source Config	Set continuous RF source output amplitude to 1.0 V into 50 Ω.	1.0 V ± 0.02 V	[] Pass [] Fail
6. Impedance Matching	Adjust TFH coupling network to match power line characteristic impedance.	VSWR < 1.20	[] Pass [] Fail
7. Baseline S ₁₁ Record	Capture baseline input reflection factor S ₁₁ = b ₁ / a ₁ across 50–500 kHz.	Baseline Trace Stored	[] Pass [] Fail
8. Spot Freq. Verification	Evaluate S ₁₁ magnitude and phase shift at 165 kHz reference frequency.	Phase Stable (± 0.5°)	[] Pass [] Fail
9. Soil Permittivity Inversion	Calculate bulk soil permittivity (ε _b) and regional weighted mean soil moisture.	ε _b = 4 ext{ (dry) to } 35 ext{ (wet)}	[] Pass [] Fail
10. Data Logging Audit	Confirm automated time-series logging and local rain gauge correlation.	Log Active / Synced	[] Pass [] Fail

FIELD NOTES & ENVIRONMENTAL INTERFERENCE LOG:

FIELD TECHNICIAN SIGN-OFF I attest that all calibration verification steps listed above have been executed strictly according to published SOP guidelines and quality assurance protocols.	Prepared & Verified By: Kadeem Manning Lead Field Specialist Signature: _____ Date: _____
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