

# TDMA-Mesh Test Specification

The following Test Report must be completed for each *WirelessHART* Device tested. This data sheet is used to report the results of testing based on the "TDMA-Mesh Test Specification" (HCF\_TEST-006).

## 1. Test Operator

Name:	_____	Company:	_____
Title:	_____	Address:	_____
Tel. No.:	_____		_____
FAX No.:	_____		_____
Email:	_____		_____

## 2. Certification

I hereby affirm that all data provided in this Test Report is accurate and complete.

Signature:	_____	Date:	_____
Name:	_____		
Title:	_____		

## 3. Test Device Identification

Manufacturer Name:	_____	Model Name(s):	_____
Manufacturer ID Code:	_____ (Hex)	Device Type Code:	_____ (Hex)
Device ID:	_____ (Hex)		
HART Protocol Revision:	_____	Device Revision:	_____
Hardware Revision:	_____	Software Revision:	_____
Revision Release Date:	_____		
Physical Layers Supported:	_____	Radio Supplier:	_____
FSK Physical Device Category:	_____	Radio P/N, Name:	_____

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## 3.1 WirelessHART Stack Vendor

Manufacturer Name: \_\_\_\_\_ (Hex)      Model Name(s): \_\_\_\_\_ (Hex)  
Manufacturer ID Code : \_\_\_\_\_ (Hex)      Device Type Code: \_\_\_\_\_ (Hex)  
Device Revision: \_\_\_\_\_      Software Revision: \_\_\_\_\_  
Hardware Revision: \_\_\_\_\_

## 4. Test Data

Test	Result
TML100 Command Audit A: Audit via Maintenance Port B: Audit via Wireless Connection C: Audit Wireless vendor-specific commands	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML101 Provisioning	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML102 Joining A: Direct Join B: Join Retry C: Join Retries	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML201 Link Table Management A: Basic add and delete Links Test B: Link Table Response Codes Test	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML202 Neighbor Table Management A: Basic add and delete Neighbors Test B: Neighbor Table Response Codes Test C: Combined Link and Neighbor Table Test	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail

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Test	Result
<p>TML203 Superframe Table Management</p> <p>A: Randomly add and delete inactive Superframes</p> <p>B: Randomly add Superframes with random initial activation status</p> <p>C: Manipulate length and properties of Superframes</p> <p>D: Delete all Superframes</p> <p>E: Write Superframe and Delete Superframe through the Maintenance Port</p> <p>F: Manipulate Handheld Superframe</p> <p>G: Verify all RX Links in a Superframe are serviced</p> <p>H: Superframe Response Codes Test</p>	<p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p>
<p>TML204 Session Table Management</p> <p>A: Basic Session Table Manipulation</p> <p>B: Session Response Codes Test</p>	<p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p>
<p>TML205 Route and Graph Table Management</p> <p>A: Route Table Management</p> <p>B: Route Response Codes Test</p> <p>C: Source Routes</p> <p>D: Graph Route and Edge Management</p> <p>E: Superframe as Graph Equivalence</p> <p>F: Write Device Nickname</p>	<p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p>
<p>TML206 Timetable Management</p> <p>A: Timetable Manipulations</p> <p>B: Timetable Response Codes Test</p> <p>C: Device Requests Burst Timetable</p>	<p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p> <p><input type="checkbox"/> Pass    <input type="checkbox"/> Fail</p>

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Test	Result
D: Device Requests Event Notification Timetable	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: Device Requests Block Transfer Timetable	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
F: Device Requests Maintenance Timetable	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML208 Basic publishing	
A: Configure Burst Mode through the Maintenance Port	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Configure Burst Mode through the Wireless Connection	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Validate that the device requests Burst Mode after it is reset	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: NM adjusts resource commitments	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: NM deletes Links	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
F: Timetable Response with invalid Route ID	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML210 Transmit Back-off Handling	
A: Test DUT's ability to use and restrict different back-off exponent values	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Test DUT's ability to infer collisions, back-off, and retry transmissions	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Configure and honor different back-off exponent limits	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML211 Time-to-Live (TTL) Management	
A: Test DUT's ability to restrict different TTL hop-count limits	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Test of DUT's TTL value processing for received NPDUs	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML212 ASN Snippet and maxPacketAge	

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Test	Result
A: Test DUT's ability to restrict different NPDU age limits	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Test of DUT's ASN snippet value processing for received NPDUs	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Test of DUT's ASN snippet processing for NPDUs addressed to it	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: Test of DUT's ASN snippet value processing for DUT-originated NPDUs	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML213 NPDU Nonce Formation	
A: Nonce sliding window management	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Duplicate NPDU detection	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Test gaps in the Nonce Counter	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: Test Nonce Counter roll-over	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: Determine if the PDU is new or old	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML214 Key Management	
A: Change Network Key	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Change NM Unicast Session Key	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Change NM Broadcast Session Key	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: Change GW Unicast Session Key	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: Change GW Broadcast Session Key	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
F: Change Network Key & GW Broadcast Session Key at the same ASN	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML215 Slot Timing	
A: Track small time perturbations	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Test with large slot timing errors	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: DUT as time source	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: DLPDUs with wrong DL ASN snippet	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: AP clock is faster than DUT clock	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
F: AP clock is slower than DUT clock	<input type="checkbox"/> Pass <input type="checkbox"/> Fail

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G: Test until DUT does not respond	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
H: Temperature Profile Test	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML216 Configurable timers	
A: Advertisement Timer	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Keep-Alive Timer	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Path Failure Timer	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: Health Report Timer	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: Broadcast Timer	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
F: Discovery Timer	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML220 Device disconnection	
A: Disconnect during normal operation	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML222 Basic DLPDU Construction	
A: Validate Superframe Header (0x41)	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Validate Address Specifier	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Validate MIC Calculations	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: Validate Sequence Number	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: Validate Network ID	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML223 DLPDU Specifier	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML224 Device Buffer Management	
A: NACK Response Codes Test	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Test packet precedence and tie-breakers	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML225 Device Join Scenarios	
A: Device joins with new Join Key	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Device joins with new Network ID	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML302 <i>Wireless</i> HART Handheld Communications	

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Test	Result
A: DUT communicates with Handheld device using handheld Superframe	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML303 Graph Routing	
A: Graph Routing-Upstream	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Graph Routing-Downstream	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Graph Routing-Broadcast not acknowledged	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: Graph Routing-Broadcast acknowledged	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: Graph Routing- destination is Neighbor	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML304 Source and Proxy routing	
A: Source Routing – destination reachable	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Source Routing – destination not reachable (end destination not a Neighbor)	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Source Routing – destination reachable (end destination is a Neighbor)	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: Proxy Routing – proxy is not a Neighbor	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
E: Proxy Routing – proxy is a Neighbor	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML305 Superframe Routing	
A: Superframe Routing	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Source + Superframe Routing	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Source + Graph Routing	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML307 Routing and Transport Layer Alarms	
A: Path Down Failure	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
B: Source Routing Failure	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
C: Graph Routing Failure	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
D: Transport Failure	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML309 Buffers and Forwarding Delay	<input type="checkbox"/> Pass <input type="checkbox"/> Fail

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Test	Result
TML311 Packet Precedence and Priority A: Arbitrates amongst receive messages B: Rejects messages when receive buffers depleted C: Test packet precedence & priority – reject according to priority threshold	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML312 Time Sync and Time Source A: AP ACKs a false time adjustment value B: VD ACKs a false time adjustment value C: AP transmits with shifted times D: VD transmits with shifted times	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML314 Acknowledged Broadcast Communications A: Process & ACK Broadcast messages B: Forward on Graph	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML401 Prioritized Conflict Resolution among Multiple Links	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML402 Clear Channel Assessment (CCA)	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
TML501 Mixed Communication Mode Stress Tests A: Combinations of Broadcast and Unicast message traffic B: Nonce Stress Test	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Pass <input type="checkbox"/> Fail