



LXI HiSLIP Test Procedures

These Test Procedures are for the following specification revision:

LXI HiSLIP Extended Function

Revision 1.01

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Bob Helsel
Executive Director
LXI Consortium
PO Box 1016
Niwot, CO 80544-1016

303-652-2571 Office – LXI
303-579-2636 Mobile
303-652-1444 Fax
ExecDir@lxistandard.org
LXI.WGs@gmail.com

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Revision history

<i>Revision</i>	<i>Description</i>
October 20, 2011	Updated to reflect rule deletions associated with revision 1.01
June 3, 2011	Add tests for 20.7.6 and 20.8.4.
March 8, 2011	Update to reference latest LXI HiSLIP spec. Revise the test for 20.4.4 and remove the test for 20.6.4 (a recommendation).
February 23, 2011	Update to reference latest LXI HiSLIP spec.
January 26, 2011	Accepted changes.
January 11, 2011	Accept initial changes; add procedure for nonSCPI device testing; add detail on detecting when the device supports Synchronous or Overlapped HiSLIP modes.
December 3, 2010	Test Procedures moved from specification to this document.

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20 LXI HiSLIP Extended Function Test Procedure

20.1 Introduction (or Overview)

The LXI HiSLIP Extended Function Test Procedures define the set of tests that an LXI device implementing LXI HiSLIP must pass to claim compliance with the LXI HiSLIP Extended Function rules and recommendations.

20.2 Test Procedure

Rule Number (Paragraph #)	Rule Name (Title)	Test Type (pick one)	Test Methodology (procedure and expected results for a pass condition)	Notes
20.4.1	Comply with LXI Core Standard	Operator Observation (manual test)	Perform LXI Core Conformance Test.	
20.4.2	Obey LXI IPv6 if supporting IPv6 for HiSLIP	Operator Observation (manual test)	Perform LXI IPv6 Conformance Test.	
20.4.3	[Deleted in version 1.01]			
20.4.4	Reset to Default HiSLIP Port and Close Connections on LCI	Operator Observation (manual test)	Open a HiSLIP connection and activate LCI on the device. If the connection closes, pass.	
20.4.4	Reset to Default HiSLIP Port and Close Connections on LCI	Operator Observation (manual test)	If the device supports changing to an alternate port, set the port to some other value, then activate LCI on the device. If the HiSLIP port reverts to 4880, pass.	
20.6.1	Implement the IVI 6.1 HiSLIP Protocol	Automated test	Run VISA-based test suite (see automated test defined below) and verify it passed.	Rationale for using VISA: we want end users to be able to connect to HiSLIP devices via VISA, and this provides some test of various VISA implementations.
20.6.2	Accept IPv4 HiSLIP connections	Automated test	Run VISA-based test suite using IPv4 HiSLIP address.	
20.6.3	Accept IPv6 HiSLIP Connections	Automated test	Run VISA-based test suite using IPv6 HiSLIP address.	Run only if LXI IPv6 is supported by the device.

20.6.4	Apply HiSLIP Locks to other LAN Interfaces	None	Open a HiSLIP connection and request a HiSLIP lock. Observe other LAN connections are locked out. If so, pass.	We will not test this recommendation.
20.7.1	Advertise the HiSLIP DNS-SD Service	Operator Observation (manual test)	Browse for ‘_hislip._tcp’ service using the LXI Single Service Instance Name. If found, Pass.	Not sure what ‘browse’ tool is used here. Current test suite may have one.
20.7.2	Use the LXI Single Service Instance Name	Operator Observation (manual test)	Browse for ‘_hislip._tcp’ service using the LXI Single Service Instance Name. If found, Pass.	May add to existing mDNS tests.
20.7.3	Use the Service Type Name ‘_hislip._tcp’	Operator Observation (manual test)	Browse for ‘_hislip._tcp’ service using the LXI Single Service Instance Name. If found, Pass.	May add to existing mDNS tests.
20.7.4	Include Required TXT Record Keys	Operator Observation (manual test)	Browse for ‘_hislip._tcp’ service using the LXI Single Service Instance Name. Check LXI-standard TXT keys are present. If found, Pass.	May add to existing mDNS tests.
20.7.5	Advertise HiSLIP DNS-SD Service after ‘_lxi._tcp’	Operator Observation (manual test)	Browse for ‘_hislip._tcp’ service using the LXI Single Service Instance Name. Confirm it is advertised after _lxi._tcp If found, Pass.	It may be necessary to create a service name conflict to check this. The _hislip._tcp service name should match the conflict-resolved service name.
20.7.6	Advertise HiSLIP DNS-SD Service with HiSLIP port.	Operator Observation (manual test)	Change the HiSLIP port on the LAN Configuration web page. Confirm that port shows up in the ‘_hislip._tcp’ service advertisement. If so, Pass.	
20.8.1	Include ‘LXI HiSLIP’ in Welcome Web Page ‘LXI Extended Functions’	Operator Observation (manual test)	Check ‘LXI HiSLIP’ is included in the comma-separated list. If found, Pass.	
20.8.2	Include HiSLIP Address String in Welcome Page ‘LXI Device Address String’	Operator Observation (manual test)	Check for the presence of the HiSLIP address string. If found, Pass.	Assuming this becomes a RULE.
20.8.3	Include HiSLIP port on the LXI LAN Configuration Page	Operator Observation (manual test)	Check for the presence of the HiSLIP port. If found, Pass.	

20.8.4	Preserve HiSLIP port across power cycles.	Operator Observation (manual test)	Change the HiSLIP port on the LAN Configuration web page. Power cycle the device. Confirm the changed HiSLIP port still appears on the LAN Configuration web page. If so, Pass.	
20.9.1	Include the HiSLIP Address String in the LXI Identification XML	Operator Observation (manual test)	Browse for the HiSLIP address string in the XML. If found, Pass.	May add to existing XML test.
20.9.2	Include the LXI HiSLIP Function in the LXI Identification XML.	Operator Observation (manual test)	Browse for the HiSLIP function, including version number and port number (if different than 4880), in the XML. If found, Pass.	

20.3 Automated Tests

The LXI HiSLIP Extended Function Test Procedure includes an automated test for compliance with the IVI 6.1 HiSLIP standard. This section defines the functional tests performed by that automated test.

20.3.1 Required Software

The automated test for the HiSLIP protocol tests key parts of that specification using a test program built using the VISA API and an implementation of VISA supporting HiSLIP. Any VISA implementing HiSLIP can be used for this test.

20.3.2 Test Definitions

The following test pseudo code covers the basic functionality of a HiSLIP connection. An exhaustive test of that functionality is left to the IVI Foundation.

These tests assume the device responds to a few standard SCPI commands sent over the HiSLIP connection. If device submitted for LXI conformance test of the LXI HiSLIP function does not support these SCPI commands and their responses, it is the responsibility of the vendor to submit a modified version of the LXI HiSLIP automated test program source (in C#) which uses equivalent commands and responses that the device does accept to demonstrate the device can pass these tests. See the next section for a list of the standard SCPI commands used.

- Test for basic HiSLIP connection:
 - Connect using a HiSLIP address string (viOpen).
 - Send *IDN? (viWrite)
 - Read ID string response (pass if any string is returned).
- Test SRQ and status byte:
 - Connect using a HiSLIP address string.
 - Enable SRQ for data-available (MAV): Send “*ESE 32;*SRE 48”
 - Send *IDN?
 - Wait to observe SRQ sent to SRQ handler in VISA program.
 - Read the status byte (viReadSTB). The MAV bit (0x10) should be set.

- Read the response.
 - Read the status byte (viReadSTB). The MAV bit (0x10) should not be set.
- Test Device Clear:
 - Connect using a HiSLIP address string.
 - Send *IDN?
 - Perform Device Clear (viClear)
 - Observe viRead times out (response no longer waiting).
- Test Interrupted handling (if device supports Synchronous mode):
 - Connect using a HiSLIP address string.
 - Set VI_ATTR_TCPIP_HISLIP_OVERLAP_EN = VI_FALSE
 - Get VI_ATTR_TCPIP_HISLIP_OVERLAP_EN. If = VI_FALSE, continue test (device supports Synchronous mode, so test it).
 - Send *IDN?
 - Send *OPC?
 - viRead '1' (and not the identification string).
- Test Overlapped mode (if the device supports it):
 - Connect using HiSLIP address string.
 - Set VI_ATTR_TCPIP_HISLIP_OVERLAP_EN = VI_TRUE
 - Get VI_ATTR_TCPIP_HISLIP_OVERLAP_EN. If = VI_TRUE, continue test (device supports Overlapped mode, so test it).
 - Send *IDN?
 - Send *OPC?
 - viRead ID string
 - viRead '1'
- Test Locking (these tests only work if the device supports multiple simultaneous HiSLIP connections):
 - Connect using a HiSLIP address string.
 - viLock (exclusive lock).
 - Start a child process: (test exclusive lock works)
 - Connect using same HiSLIP address string.
 - Send *IDN?
 - viRead returns VI_ERROR_RSRC_LOCKED after a delay (>= VISA timeout)
 - Get the status byte (viReadSTB). Observe this returns with no error.
 - Set the device to local (viGpibControlRen(go to remote). Observe this returns with no error. (note the change is deferred until after the parent lock is released)
 - viUnlock
 - Start a child process: (test exclusive lock released)
 - Connect using same HiSLIP address string.
 - Send *IDN?
 - viRead response should get the ID string.
 - viLock(shared lock)
 - Start a child process: (test shared lock works)
 - Connect using same HiSLIP address string.
 - Send *IDN?
 - viRead returns VI_ERROR_RSRC_LOCKED after a delay (>= VISA timeout)
 - Start a child process: (shared lock can be shared)
 - Connect using same HiSLIP address string.
 - viLock (same shared lock ID)
 - Send *IDN?
 - viRead response should get the ID string.
 - viUnlock
 - viUnlock
 - Start a child process: (test shared lock released)
 - Connect using same HiSLIP address string.
 - Send *IDN?
 - viRead response should get the ID string.

- viLock (shared lock)
- viLock (exclusive lock)
- end connection (without unlocking)
- Start a child process: (test locks are released when connections end)
 - Connect using same HiSLIP address string.
 - Send *IDN?
 - viRead response should get the ID string.
- Test Lock Info:
 - Connect using HiSLIP address string.
 - viLock(Shared lock)
 - Check viGetAttr(VI_ATTR_RSRC_LOCK_STATE) returns VI_SHARED_LOCK
 - viLock (Exclusive lock)
 - Check viGetAttr(VI_ATTR_RSRC_LOCK_STATE) returns VI_EXCLUSIVE_LOCK
 - viUnlock
 - Check viGetAttr(VI_ATTR_RSRC_LOCK_STATE) returns VI_SHARED_LOCK
 - viUnlock
 - Check viGetAttr(VI_ATTR_RSRC_LOCK_STATE) returns VI_NO_LOCK

20.3.3 Summary of SCPI Commands Used

- Query1:
 - Command used: *IDN?
 - Response: “<Manufacturer>,<Model>,<SerialNumber>,<firmwareVersion>”
 - Used for: a command with a unique response for the instrument
 - Test requirements: must contain a character unique from the other query used. (standard test uses the ‘,’ as the unique character)
- Query2:
 - Command used: *OPC?
 - Response: 1
 - Used for: another query with a unique response.
 - Test Requirements: must not contain the unique character contained in the Query1 response.
- Enable SRQ:
 - Command used: *ESE 32;*SRE 48
 - Response: none
 - Used for: enabling SRQ signal for data available (MAV).
 - Test requirements: must enable SRQ.

20.4 Issues