



Itron Partner Milli Qualification Preparation

Revision 3.1

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Revision/History

Revision	Reason	Date
1.0	Initial draft.	3/25/2019
2.0	Minor Edits	3/26/2019
3.0	Additional detail of when to run each CoAP test. Cleaned up SSNI references.	3/27/2019
3.1	Added the need to expose debug header and provide connector cable.	4/1/2019
3.2	Cleaned up the channel frequencies in section 3.2	4/14/2019

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1 Introduction

The purpose of this document is to document what an Itron partner must do to prepare for the Itron Milli device certification testing. The document intends to describe all the pre-requisites for the device maker to prepare for the test lab to execute the testing.

The information documented herein will be required by the test lab to begin planning to execute the testing.

1.1 Partner Responsibility and Document Scope

Fill out the information specified in this document and provide to the test lab at least 2 weeks before test execution. Some of the information is required to plan the test execution.

1.2 Reference Web Site

Itron developer portal provides documentation and tutorials help partners learn more about our technology:
<https://developer.ssni.com>

There is a variety of information available; some without an account, more when signed in with an authenticated account, and some requiring explicit permission being granted by an Itron project representative. Sign up for an account and work with you Itron project manager to get access to any necessary technical documentation. This test plan has links back to specific documentation on the website which can provide further assistance in understanding specific aspects of a given test.

1.3 Approved Test Labs

The tests must be conducted by an Itron approved test lab. Approved test labs can be found [here](#).

1.4 Terms and Acronyms

Table 1

Acronym/ Term	Definition/Description
IOTR	Internet of Things (IOT) Router – used for connecting devices to the Itron back office suite of software.
UUT	Unit Under Test

2 Hardware and Software Pre-requisites

2.1 Pre-requisite 1: UUT accessories

The UUT must be powered with the same battery or external power supply as the device deployed in the field. The power supply must be supplied to the test lab. The UUT must be tested with the same antenna as the device deployed in the field. The antenna must be supplied to the lab.

If any configuration such as changing the country code is to be performed by the lab then you must supply any cables required and instructions to the test lab.

2.2 Pre-requisite 2: Pre-production or production sample

The UUT must be a pre-production or production sample. The unit must have the same enclosure material, form factor, power supply, processors, communication modules, antenna, PCB, and BOM. Prototypes are not acceptable. The test lab will need two complete test units and accessories such as power supplies, antennas, etc.

2.3 Pre-requisite 3: Test mode

The device must provide a way to test the device input and output data in a lab setting. There must be a way to generate all data sent from the device either on demand or in a short time in order to complete testing in reasonable lab time (measured in seconds or minutes not hours or days). There must also be a way to send, update or delete any device resources that will be possible in the field deployed devices. The UUT test mode must be enabled by a simple power OFF/ON sequence, switch, button, programmatic command, GPIOs, or built-in tests.

Test mode timing should be confirmed with the test lab to be adequate for testing by the lab chosen.

2.4 Pre-requisite 4: Ability to change firmware image

The debug pins must be exposed from the Milli and the test lab must be provided instructions along with the proper cable connector for the purpose of changing the firmware image (aka mode).

3 Process to Certify

3.1 Review Test Plan

Review the Developer Portal [Milli certification process](#) description.

Download the Itron [Partner Milli Qualification Test Plan](#) from the [Developer Portal](#). Read the performance test specifications for antenna pattern, receive sensitivity and CoAP interoperability carefully to ensure the UUT will meet the test requirements.

3.2 Countries to Certify

The following countries are supported.

BAND	CC*	IoTR HW	Milli HW	FREQUENCY BAND	POWER	COUNTRIES
AUS	36	2	1	915-928 MHz	350 mW (eirp)	AUS
USA	840	1	1	902-928 MHz	350 mW (eirp)	USA, CAN, JAM
SGP	702	2	1	920-925 MHz	350 mW (erp)	SGP
EU873	826	3	2	870-873 MHz	500 mW erp	CHE, EST, FIN, GBR, HUN, ISL, IRL, LUX, PRT, SWE
EU876	208	3	2	870-875.6 MHz	500 mW erp	ALB, DNK, MDA, NOR, SVN

* The CC is the "country code" that will be used to configure the device for the proper country frequency band.

Identify the countries for which your product must be certified. Milli hardware 1 and 2 are different Itron hardware parts and must be certified with different products. For each hardware type identify the Bands associated with the countries to be certified. Each identified Band will require separate Antenna Pattern and Receive Sensitivity testing by the test lab.

3.3 Identify CoAP Use Cases

Review the CoAP test cases in section 4 of the Milli Certification Test Plan and identify the CoAP use cases that apply to your device.

Note that your device will be certified for only modes that have been identified as implemented on the device. These will be part of the certification records and proof to the customer base that the device is properly certified for all necessary communications. If on audit it is determined that the device requires CoAP methods not identified for testing certification will be revoked and recertification required.

3.3.1 Core CoAP Use Cases

In table 4.1.3 of the Milli Certification Test Plan identify the methods supported on the device. Identify which Core CoAP test cases need to be run marking them in the following table. For each test case to be run identify the resource URIs and other information as indicated.

No	Base (aka Core) CoAP	Run	Resource Detail
1.	Perform GET transaction (CON mode). Run if any resource can be read or observed. Note any Observable resource should also support standard GET.		URIs
2.	Perform DELETE transaction (CON mode). Run if server offers a resource that handles DELETE.		URIs
3.	Perform PUT transaction (CON mode). Run if server offers already available resource or accepts creation of new resource that handles PUT.		URIs, content formats
4.	Perform POST transaction (CON mode). Run if Server accepts POST request on a resource.		URIs, content formats
5.	Perform GET transaction (NON mode). Run if any resource can be read or observed. Note any Observable resource should also support standard GET.		URIs
6.	Perform DELETE transaction (NON mode). Run if server offers a resource that handles DELETE.		URIs
7.	Perform PUT transaction (NON mode). Run if server offers already available resource or accepts creation of new resource that handles PUT.		URIs, content formats
8.	Perform POST transaction (NON mode). Run if server accepts POST request on a resource.		URIs, content formats
9.	Perform GET transaction with separate response (CON mode, no piggyback). Run if server offers a resource which is not served immediately and which therefore is not acknowledged in a piggybacked way.		URIs
10.	Perform GET transaction containing non-empty Token (CON mode). Run if server offers a resource with resource content not empty that handles GET.		URIs
11.	Perform GET transaction containing non-empty Token with a separate response (CON mode). Run if server offers a resource which is not served immediately and which therefore is not acknowledged in a piggybacked way.		URIs
12.	Perform GET transaction using empty Token (CON mode). Run if server offers a resource with resource content not empty that handles GET.		URIs

13.	Perform GET transaction containing several URI-Path options (CON mode). Run if server offers several resources with resource content is not empty.		URIs
14.	Perform GET transaction containing several URI-Query options (CON mode). Server offers a resource with query parameters and resource content is not empty		URIs, Query parameter details
15.	Perform GET transaction (CON mode, piggybacked response) in a lossy context. Run if any resource can be read or observed. Note any Observable resource should also support standard GET.		URIs
16.	Perform GET transaction (CON mode, delayed response) in a lossy context. Run if server offers a resource which is not served immediately and which therefore is not acknowledged in a piggybacked way.		URIs
17.	Perform GET transaction with a separate response (NON mode). Run if server offers a resource which is not served immediately and which therefore is not acknowledged in a piggybacked way.		URIs
18.	Perform POST transaction with responses containing several Location-Path options (CON mode). Run if server accepts creation of new resource and the created resource has multiple "Location-Path" options.		URIs, Location-Path option details
19.	Perform POST transaction with responses containing several Location-Query options (CON mode). Run if server accepts creation of new resource where the location of the created resource contains location-query parameters.		URIs, Location-query parameter details.
20.	Perform GET transaction containing the Accept option (CON mode). Run if server provides resources with multiple format options.		URIs, Format option details.
21.	Perform GET transaction containing the ETag option (CON mode). Run if server offers a resource with validate options which may be made to vary over time; and server supports ETag option.		URIs
22.	Perform GET transaction with responses containing the ETag option and requests containing the If-Match option (CON mode). Run if server offers a resource with validate options which may be made to vary over time; and server supports ETag and If-Match options.		URIs
23.	Perform PUT transaction containing the If-None-Match option (CON mode). Run if server offers a resource, which does not exist and can be created by the client; and server supports If-Non-Match option.		URIs

3.3.2 Link Format CoAP Use Cases

In table 4.2.3 of the Milli Certification Test Plan identify the methods supported on the device. Identify which Link format CoAP test cases need to be run marking them in the following table. Test 1 is mandatory and tests 4 and 5 do not need to be tested. For each test case to be run identify the resource URIs and other information as indicated.

No	Link Format CoAP	Run	Resource Detail
1.	Access to well-known interface for resource discovery (i.e. /.well-known/core)	Y	
2.	Use filtered requests for limiting discovery results. Run if device CoAP server offers different types of resources.		URIs, Type details
3.	Handle empty prefix value strings. Run if device CoAP server offers different types of resources and resources with no type.		URIs, Type details
4.	Filter discovery results in presence of multiple rt attributes	N	
5.	Filter discovery results using if attribute and prefix value strings	N	
6.	Filter discovery results using sz attribute and prefix value strings. Run if device CoAP server offers resources both with and without sz attribute.		URIs, sz attribute details
7.	Filter discovery results using href attribute and complete value strings. Run if server offers multiple URL resources.		URIs, href attribute details
8.	Filter discovery results using href attribute and prefix value strings. Get all resources with wildcarded link.		URIs, href attribute details
9.	Arrange link descriptions hierarchically. Run if server offers a resource with content type 40 (i.e. application/link-format) and sub-resources.		URIs, resource and sub-resource details

3.3.3 Observe CoAP Use Cases

Device generated data (sometimes referred to as bubble-up or alerts) are implemented on the device as Observe resources. The Milli can be configured to deliver Observe resource in response to a client placing an Observe on the resource or via MQTT as “bubble-up” to which clients can subscribe to topics. The device implementation of these resources are the same and implemented as a CoAP server so a CoAP Observe client is used by the test lab for this testing.

In table 4.3.3 of the Milli Certification Test Plan identify the methods supported on the device. Identify which Link format CoAP test cases need to be run marking them in the following table. For each test case to be run identify the resource URIs and other information as indicated.

No	Observe CoAP	Run	Resource Detail
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1.	Handle resource observation with CON messages		URIs, any necessary reference details
2.	Handle resource observation with NON messages		URIs, any necessary reference details
3.	NA		
4.	Client detection of deregistration (Max-Age). Run this test if test 1 is run.		URIs
5.	Server detection of deregistration (client OFF). Run this test if test 1 is run.		URIs
6.	Server detection of deregistration (explicit RST). Run this test if test 1 is run.		URIs
7.	Server cleans the observers list on DELETE. Run this test if test 1 is run.		URIs
8.	Server cleans the observers list when observed resource content-format changes. Run this test if test 1 is run.		URIs
9.	Update of the observed resource. Run this test if test 1 is run.		URIs
10.	GET does not cancel resource observation. Run this test if test 1 is run.		URIs
11.	Handle resource observation with CON messages (lossy case). Run this test if test 1 is run.		URIs
12.	GET with Observe=1 does cancel resource observation. Run this test if test 1 is run.		URIs

3.4 Contact Test Lab

Choose an Itron [approved test lab](#) to perform the Itron certification testing. Contact the chosen lab directly to book a slot. Payment for conducting the tests is done directly to the test lab.

3.5 Prepare and Ship Test Units

3.5.1 Configure Milli Personalization Profile

The test units should be configured with the leaf node aggressive CoAP profile with the Starfish Stage network ID (1711) and country code to be certified. The instructions to configure the device with the profile can be found on the [Milli Personalization page](#) on the Developer Portal. The personalization profile to use is either "[Leaf Node Aggressive \(Dev Kit\) CoAP EU](#)" for Europe or "[Leaf Node Aggressive \(Dev Kit\) CoAP](#)" for the rest of the world.

3.5.2 Test Unit Operation Instructions

Provide an operation manual or description of the device operation including resource URI's. Describe the data available to be retrieved on demand (GET) or with a persistent Observe, any resources that can be PUT, POST

or DELETED. Describe what schedule, conditions, or triggers cause device generated messages (aka bubble-up or persistent observe collected data) to be generated. Describe any test modes available and how to initiate the test modes.

The documentation should also describe how to connect to the debug/test port connectors to perform any necessary configuration changes such as changing country code to test different RF bands.

3.5.3 Ship All Material to Test Lab

Package and ship two complete test units and accessories (power supplies, antennas, etc) to the test lab. Provide the following information to the test lab:

- Device name
- Device model
- Device dimensions
- Voltage type and level
- Antenna type and gain
- 2 complete test units and accessories (including debug header connector cable)
- Country RF bands to certify from the table above
- CoAP tests to run and CoAP resource details per above tables

3.6 Conduct Tests

The test house will conduct tests and work with you to remediate any issues.

3.7 Test Report

The test house will generate a report and send it to Itron

3.8 Certificate

Itron will review the test results and if all tests pass will issue a certificate for the device.