

IIS Interoperability Status Check

Independent Report by

Nathan Bunker

Dandelion Software & Research Inc.

What is a standard?

stand·ard

/ˈstændərd/ 

noun

1. a level of quality or attainment.
"their restaurant offers a high standard of service"
synonyms: [quality](#), [level](#), [grade](#), [caliber](#), [merit](#), [excellence](#) [More](#)
2. an idea or thing used as a measure, norm, or model in comparative evaluations.
"the wages are low by today's standards"

adjective

1. used or accepted as normal or average.
"the standard rate of income tax"
synonyms: [normal](#), [usual](#), [typical](#), [stock](#), [common](#), [ordinary](#), [customary](#),
[conventional](#), [wonted](#), [established](#), [well-established](#), [settled](#), [set](#), [fixed](#),
[traditional](#), [prevailing](#) [More](#)
2. (of a tree or shrub) growing on an erect stem of full height.

Standards for Electrical Plugs

- What standard defines these items?
 - **BS 1363 (Type G), also called the "13 Amp plug"**
- In which countries is this standard used?
 - **United Kingdom, Ireland, Hong Kong, Malta, Cyprus, etc.**





EXPRESS

Home of
the Daily and
Sunday Express

Sign
Regis
Wea
Lonc

HOME

NEWS

SPORT

COMMENT

FINANCE

ENTERTAINME

UK

WORLD

SHOWBIZ

ROYAL

WEIRD

HEALTH

PROPERTY

SCIENCE & TECH

RETIREME

Home > News > UK > DIY dunces who can't wire a plug

DIY dunces who can't wire a plug

BRITAIN'S youngsters have lost the do-it-yourself skills their parents took for granted.

Published: Wed, April 3, 2013

1 Comments

f Like 1

t Tweet 3

+1 0

Eight per cent of 18 to 25-year-olds admit they cannot figure out how to wire a plug, a [survey](#) has found.

Only one in 20 thought they could unblock a sink, bleed a radiator, or put up wallpaper. And 17 per cent claimed they would even struggle to hang a picture.

Seven out of eight doubted that they could use a power drill



Science

Print

Mains electricity

Page: 1 | 2 | 3 | 4 | 5 | 6

Next >

The UK mains electricity supply is about 230V and can kill if not used safely. Electrical circuits, cables, plugs and appliances are designed to reduce the chances of receiving an electric shock. The more electrical energy used, the greater the cost. Electrical supplies can be direct current (d.c.) or alternating current (a.c.).

Wiring a plug

You should know the features of a correctly wired three-pin mains electricity plug and be able to recognise errors in the wiring of a plug.

The cable

A mains electricity cable contains two or three inner wires. Each has a core of copper, because copper is a good conductor of electricity. The outer layers are flexible plastic, because plastic is a good electrical *insulator*. The inner wires are colour coded:

Colours of inner wires within a cable

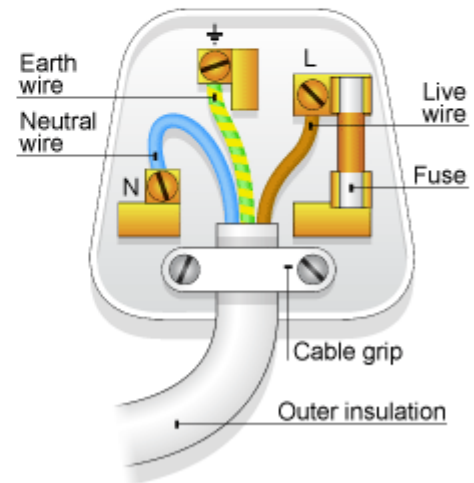
| colour | wire |
|--------------------------|---------|
| blue | neutral |
| brown | live |
| green and yellow stripes | earth |

The plug

The features of a plug are:

- The case is made from tough plastic or rubber, because these materials are good electrical insulators.
- The three pins are made from brass, which is a good conductor of electricity.
- There is a *fuse* between the live terminal and the live pin.
- The fuse breaks the circuit if too much current flows.
- The cable is secured in the plug by a cable grip. This should grip the cable itself, and not the individual wires inside it.

The diagram shows the key features of a correctly wired three-pin mains plug.



The inside of a plug

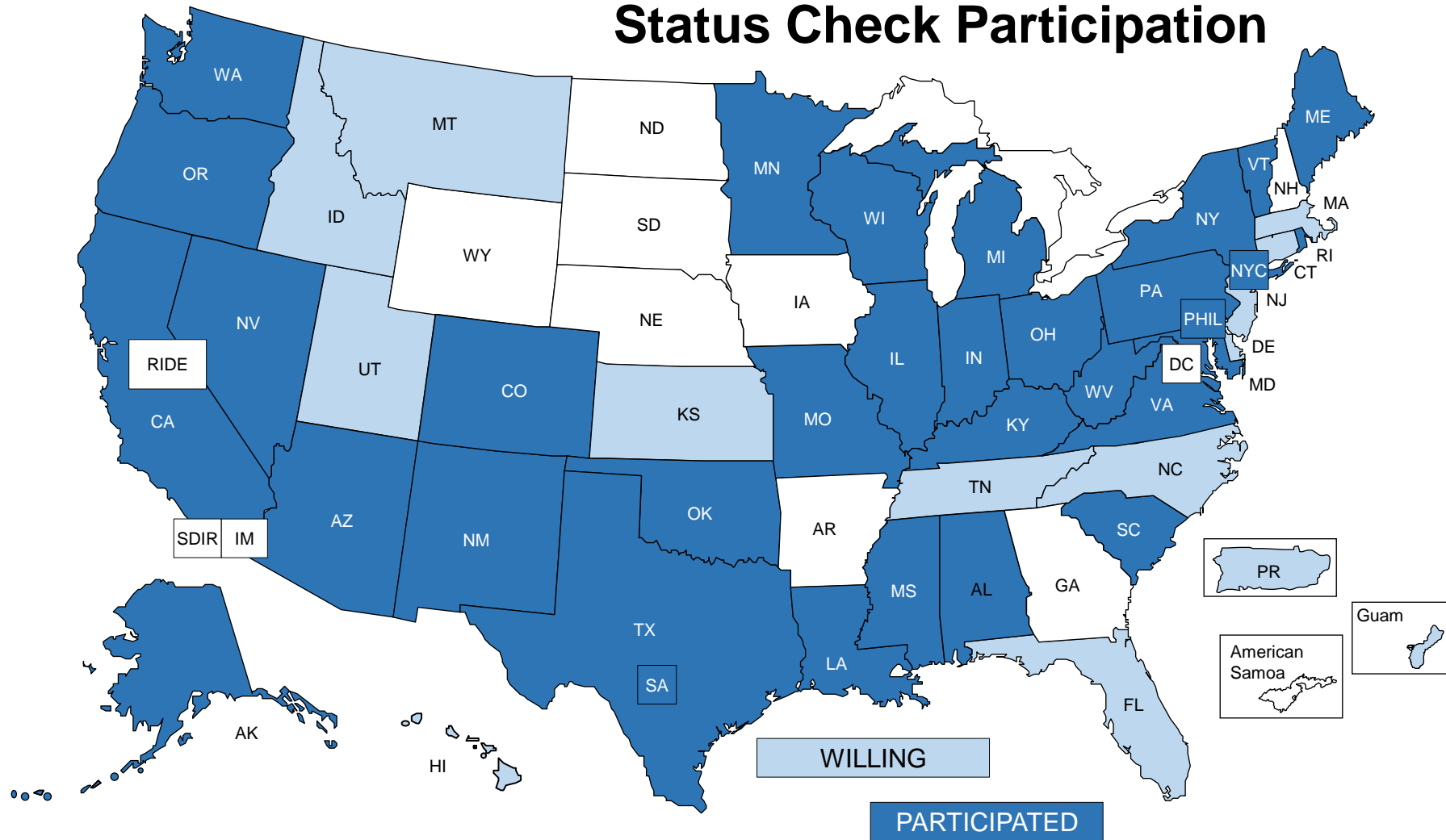
Background

- Certified Electronic Health Record (EHR) systems must be able to demonstrate the ability to support seven (7) scenarios
 - Developed in the Summer of 2012 by NIST with cooperation from the Immunization Information System (IIS) community
- EHR system vendors are now building support and upgrading systems
- This certification process is good news for IIS
- Status Check project is designed to verify if IIS are ready to work with these soon to be upgraded EHR systems

Status Check Process Born

- AIRA meeting 2012
 - Discussed preliminary results from Indian Health Service IIS profiling project
- December 2013
 - CDC Immunization Information Systems Support Branch announced short term project to check status of IIS interfaces
- Identified Need:
 - Check and see if IIS are ready to accept the new NIST certified messages that EHR systems will be sending in 2014
- Who could participate:
 - Any IIS with an HL7 interface

Status Check Participation



Status Check Process

1. Seven (7) NIST test messages were submitted to each IIS
2. The results were reviewed to determine if each message was accepted
3. If a message was rejected, changes were made to the message, and the process was repeated starting from step 1
4. After all messages are accepted, the changes made to the message were documented and analyzed
5. Any change made that was not anticipated by NIST certification was labeled as a “local requirement” or in other words local constraint

Limitations on Findings

- Limited duration of the status check project:
 - Idea for project first discussed just last year at this meeting
 - Status checks were conducted from January through March 2013
- Limited time for engagement and analysis:
 - Work conducted by part-time staff (Nathan Bunker and Heather Yarde)
 - Most IIS who participated were very busy on pressing HL7 integration projects
- Limited scope of status check:
 - Focused on engaging the maximum number of IIS
 - Process did not include step to verify if information was received as expected
 - Report does not include improvements that may have been made since

Use of Status Check Results

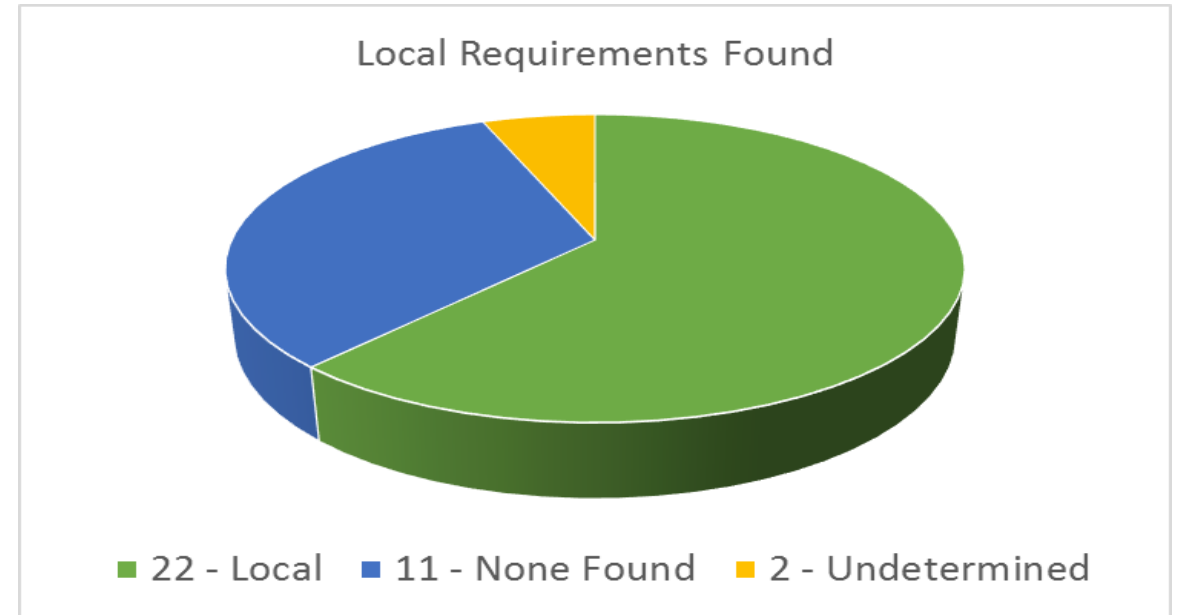
- Status check results can NOT be used to:
 - Verify that an IIS is ready to receive meaningful use messages
 - Verify that an IIS is NOT ready to receive meaningful use messages
- Status check results should be used by IIS to:
 - Identify areas that could be changed or improved to align more closely to national standards
- Status check results should be used by EHR systems:
 - To understand some of the local variations that will be encountered now
- Status check results should be used by the IIS community to:
 - To provide focus to areas that need further discussion and clarification

Results Overall

- All IIS that participated supported the HL7 2.5.1 or HL7 2.3.1 standard
- The IIS that didn't participate are known to already have or will have soon HL7 2.5.1 interfaces
- IIS have shown great support for the HL7 community standard by universally adopting it
- There are minor local variations that must be considered by any EHR system integrating with IIS across the US

Results

- The most common reasons for minor local variations are:
 - Local requirements for identifying the sender of the message
 - Inability to correctly handle vaccination refusals or history of disease
 - Rigid enforcement of minor technical requirements based on local interpretations of current or previous standards
 - Problems correctly accepting or ignoring certain types of vaccination information



Identifying the sender of the message

- IIS have several different methods used for identifying and authenticating the sender of the message:
 - Transport Layer
 - MSH-4 Sending Facility
 - MSH-4.2 Sending Facility – Universal Id
 - MSH-8 Security
 - RXA-11.4 Administered-at-Location Facility
 - Combinations of any of these fields
- Problem of identifying the sender is common to all IIS
- IIS are solving this problem in different ways

Vaccination Refusals or History of Disease

- Many IIS are not prepared to accept vaccination refusals or history of disease (such as history of varicella)
 - IIS are not required to store either of these types of information, but shouldn't reject messages that contain them
- NIST requires EHR systems to be able to report this information
 - All IIS will potentially receive vaccination refusals and history of disease information
- All IIS should ensure that HL7 interface can:
 - Accept or ignore RXA segments with a CVX code of 998 in RXA-5
 - Accept or ignore RXA segments with Completion Status of RE in RXA-20

Too Rigid Enforcement of HL7 Rules

- Rejection of messages for optional or required-but-may be empty fields that are generally not critical to IIS functions:
 - Rejecting message because RXA-4 Date/Time End of Administration field is empty
 - Rejecting message because the ethnicity code was not recognized
 - Rejecting message because value in RXA-9.2 was not what was expected
 - Rejecting messages because the LOINC in OBX-3 was not recognized
- IIS should not reject entire message if:
 - Problem occurs in optional or required-but-may-be-empty fields
 - Does not severely impact quality of core data received

Certain Types of Vaccination Information

- NIST requires EHR systems to report the following information in OBX segments:
 - VIS type
 - VIS published date
 - VIS given date
 - VFC status for immunization
- Many IIS complained or rejected messages with these types of fields in them
 - IIS may warn sender that these fields were not accepted
 - IIS should not reject messages when these fields are present

Other Local Rules

- Some other local rules were identified:
 - Requiring insurance information (IN1 segment)
 - Requiring address (very common requirement)
 - Requiring consent on child and/or adult records
 - Requiring that the sender NOT submit SSN
 - Requiring vaccinations for new patient records
- Many of these requirements should be documented nationally for EHR system implementers
- Some of these requirements could be captured as comments or defined optional uses in the national guide

Recommendations

- Short Term for 2013
 - Create a companion document to the CDC Implementation Guide that details known local requirements
 - IIS should provide EHR vendors with regular and ongoing access to the IIS test system
 - IIS should work towards reducing local requirements and aligning to the national standard, particularly in areas that do not directly impact local IIS policies and project requirements

Recommendations

- Medium Term for 2013-2015
 - IIS community should discuss and harmonize standards for authenticating and identifying submitters
 - IIS community should discuss and harmonize the format and contents of Acknowledgement (ACK) messages
 - IIS should continue adopting the national transport standard recommended by the Transport Layer Expert Panel

Recommendations

- Long Term for 2013-2020
 - IIS Interoperability Status Check or equivalent process should be conducted on a regular basis
 - The process of identifying local requirements and aligning them to national standards should continue, either by encouraging the adoption of national standards at the local level or by defining and creating a national standard to support the common local usage
 - Certification standard or conformance process for IIS HL7 interfaces should be developed

Thank You

- Indian Health Service
 - Cecile Town, Amy Groom
- Immunization Information Services Support Branch
 - Warren Williams, Stuart Meyerburg, Rob Savage
- National Institute of Standards and Technology
 - Rob Snelick, Sandra Martinez
- Office National Coordinator for Health Information Technology
 - Jim Daniels
- Immunization Information Systems
 - Too many to list!