

International Telephone Number Format and Validation Library

Version 2.0 for Perl 5

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The *InternationalTelephone Number Format and Validation Library* supports a total of 40 countries. The primary use of this library is to correctly format user entered international telephone numbers and to provide basic validation of the numbers.

The Perl version is designed for and requires Perl version 5 or above. It includes a total of 23 source files. The primary source file *phonelib.pl* and the associated country specific files should be copied directly to the working directory (generally */cgi-bin/* for web based scripts) of your working CGI or Perl script. The country specific modules are loaded on demand by the primary routine using the Perl *require* statement specifying the module name only without path information.

The library is extremely flexible with its input requirements. Telephone numbers may be submitted for formatting and validation with or without delimiting characters. The library will accept numbers containing alphanumeric values. Alpha characters will be converted to their numeric equivalents using standard telephone keypad assignments.

1	2	3
	A B C	D E F
4	5	6
G H I	J K L	M N O
7	8	9
P Q R S	T U V	W X Y Z
*	0	#

Validation support varies depending on the country. International (*dialing*) country codes and number length checks are performed for all supported countries. Area *code* (also known as *National Destination Codes*, *City Codes*, *Regional Identification Numbers* etc.) validation is supported for most countries. For some countries numbers are validated based on assignment ranges.

Module: phonenumber.pl

This module provides the front-end single entry point to the library country specific support modules. Though the country specific modules could be called directly this interface provides more flexibility as additional country support is added.

It is assumed the library will be called from a CGI or similar script to validate and format a user entered telephone number. In order to return both a status code and the formatted telephone number, the telephone number should be passed via an assigned variable. Additional parameters may be passed via assigned variables or string literal.

The telephone number may be specified using either national or international format. When the number is specified using national format an ISO 3166 country code should be passed telling the library which country validation to use, there is no default country.

For example: the national format number 2482001234 could be a valid United States (Michigan) telephone number but it could also be valid for Tlaxcala Mexico. If the number were passed using the international format +52 2482001234 it would be checked using the Mexico validation module.

If the same number is passed using the international format +1 2482001234, the North American module would be used and the area code 248 would be validated however you would still want to pass the ISO 3166 code 'US' to validate it as a United States area code.

:: isPhoneCode (\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code. This parameter should generally be used to clearly identify the country specific validation. Note, due to Perl's parameter passing methodology, this field must be passed in order for the optional state field to be recognized.

\$state

Optional parameter specifying state or province abbreviation. When present will validate the telephone area code at the state. *See Appendix A, B, and C for recognized values.*

Return Values:

- 1 country not supported
- 0 success
- 1 missing telephone number
- 2 missing telephone number area code
- 3 invalid telephone number country code
- 4 invalid characters in telephone number
- 5 telephone number too short
- 6 telephone number too long
- 7 invalid telephone number length
- 8 invalid area code

- 9 invalid telephone exchange
- 10 area code mismatch or not found
- 11 area code does not match country
- 12 area code does not match state or province

Usage:

To use the library you must include it within your script. This is generally done using a simple Perl *require* statement. Once included you can call the handler passing the appropriate parameters.

Example:

To use the library you must include it within your script. This is generally done using a simple Perl *require* statement. Once included you can call the handler passing the appropriate parameters.

```
require 'phonenumber.pl';

my $x_phone = '2012001234';
my $iso = 'US';
my $state = 'NJ';

my $result = isPhoneCode($x_phone,$iso,$state);

if ($result == 0)
{
    # number passed basic validation ... $x_phone will contain the formatted
    # telephone number (201) 200-1234
    print $x_phone;
}
```

Country Specific Modules

The library includes the additional Perl library source files listed below. Each module includes the full-unencrypted Perl source and may include associated supporting data embedded in the source file.

Module Name	Countries Supported	Validation Performed
ad.pl	Andorra	Country code, number length
au.pl	Australia	Country code, number length, area code, area code to state
be.pl	Belgium	Country code, number length
ch.pl	Switzerland	Country code, number length
de.pl	Germany	Country code, number length, area code
dk.pl	Denmark	Country code, number length, area code
ee.pl	Estonia	Country code, number length, area code
fo.pl	Faeroe Islands	Country code, number length, assigned range
fr.pl	France	Country code, number length, area code
gb.pl	United Kingdom	Country code, number length, area code
ie.pl	Ireland	Country code, number length, area code, assigned range
is.pl	Iceland	Country code, number length, assigned range
it.pl	Italy	Country code, number length
li.pl	Liechtenstein	Country code, number length, area (group) code
lu.pl	Luxembourg	Country code, number length, area (group) code
mx.pl	Mexico	Country code, number length, area code, area code to state
nl.pl	Netherlands	Country code, number length, area code
no.pl	Norway	Country code, number length, assigned range
nz.pl	New Zealand	Country code, number length, area code
se.pl	Sweden	Country code, number length, area code
us.pl	United States Canada Bahamas Barbados Anguilla Antigua and Barbuda Virgin Islands, British Virgin Islands, US Cayman Islands Bermuda Grenada Turks and Caicos Islands Montserrat Saint Lucia Dominica Saint Vincent/The Grenadines Dominican Republic Trinidad and Tobago Saint Kitts and Nevis Jamaica	Country code, number length, area code, area code to country, area code to state/province

Module: us.pl

This module provides support for countries participating in the North American Number Plan, international country code +1. Participating countries include:

ISO 3166 Country Code	Country Name
US	United States
CA	Canada
BS	Bahamas
BB	Barbados
AI	Anguilla
AG	Antigua and Barbuda
VG	Virgin Islands, British
US	Virgin Islands, US
KY	Cayman Islands
BM	Bermuda
GD	Grenada
TC	Turks and Caicos Islands
MS	Montserrat
LC	Saint Lucia
DM	Dominica
VC	Saint Vincent and The Grenadines
DO	Dominican Republic
TT	Trinidad and Tobago
KN	Saint Kitts and Nevis
JM	Jamaica

North American telephone numbers are always 10 digits (excluding country code). Area codes and local exchanges are 3 digits each using the format NXX where N may be any digit 2 through 9.

<i>Country Code (CC)</i>	<i>Area Code</i>	<i>Local Exchange</i>	<i>Local number (SN – subscriber number) X₁ X₂ X₃ X₄</i>
1	NXX	NXX	

Validation includes basic length and component value check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

The area code is always validated for North American numbers. If the ISO 3166 country code parameter is passed then the area code will be validated against the country code as well. Additionally if the specified country is either the United States or Canada and the state or province abbreviation parameter is passed then the area code will be validated against both the state or province and country.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter specifying the ISO 3166 alpha 2 country code. When present will validate the telephone area code at the national level.

\$state

Optional parameter specifying USPS state abbreviation or Canada Post province abbreviation. When present and country code is US or CA will validate the telephone area code at the state or province level. *See Appendix A for recognized values.*

Example 1:

To validate and format the telephone number verifying area code 201 is valid for North America, only the telephone number is required.

```
require 'us.pl';

my $x_phone = '2012001234';
my $result = isPhone($x_phone);

if ($result == 0)
{
  # number passed basic validation ... $x_phone will contain the formatted
  # telephone number (201) 200-1234
  print $x_phone;
}
```

Example 2:

To validate and format the telephone number verifying area code 201 is valid for the United States; both the telephone number and country code are required.

```
require 'us.pl';

my $x_phone = '2012001234';
my $result = isPhone($x_phone,'US');

if ($result == 0)
{
  # number passed basic validation ... $x_phone will contain the formatted
  # telephone number (201) 200-1234
  print $x_phone;
}
```

Example 3:

To validate and format the telephone number verifying area code 201 is valid for the state of New Jersey in the United States, all three parameters; the telephone number, country code and state abbreviation are required.

```
require 'us.pl';

my $x_phone = '2012001234';
my $result = isPhone($x_phone,'US','NJ');

if ($result == 0)
{
  # number passed basic validation ... $x_phone will contain the formatted
  # telephone number (201) 200-1234
  print $x_phone;
}
```

Module: mx.pl (Mexico)

This module provides support for Mexico. The Mexico national telephone number is 10 digits (excluding country code) and includes the region identification number (area code) and the local number, as shown below:

<i>Country Code (CC)</i>	<i>Area Code / RIN (National Destination Code - NDC)</i>	<i>Local number (SN – subscriber number)</i>
52	(A B) ^(*)	X ₁ X ₂ X ₃ X ₄ X ₅ X ₆ X ₇ X ₈
52	(A B C) ^(**)	X ₁ X ₂ X ₃ X ₄ X ₅ X ₆ X ₇

^(*) Two digit area codes for cities with a high telephone density. Mexico City, Guadalajara and Monterrey.
^(**) Three digit area codes for other cities and localities of the country.

Validation includes basic number length and area code check. The module does not perform subscriber number specific validation.

The area code is always validated at the national level. It may also be validated at the state level by passing 'MX' or '' for the \$iso country parameter and the accepted state abbreviation for the \$state parameter. The formatted telephone number is always returned using international format.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code MX is assumed. Note, due to Perl's parameter passing methodology, this field must be passed in order for the optional state field to be recognized.

\$state

Optional parameter specifying Mexican state abbreviation. When present will validate the telephone area code at the state. *See Appendix B for recognized values.*

Example 3:

To validate and format the telephone number verifying area code 236 is valid for the state of Puebla Mexico, all three parameters; the telephone number, country code (or empty string '' place holder) and state abbreviation are required.

```
require 'mx.pl';

my $x_phone = '2361234567';
my $result = isPhone($x_phone,'MX','PUE');

if ($result == 0)
{
  # number passed basic validation ... $x_phone will contain the formatted
  # telephone number +52 236 123 4567
  print $x_phone;
}
```

Module: se.pl (Sweden)

This module provides support for Sweden; international country code +46. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

Telephone numbers in Sweden contain a 1 to 3 digit area code (NDC) followed by a 7 to 9 digit subscriber number (*National Significant Number*). The area code is always validated at the national level. The formatted telephone number is always returned using international format.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code SE is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed however the internal module data does contain city names to area code data associations.

Module: de.pl (Germany)

This module provides support for Germany; international country code +49. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code DE is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed however the internal module data does contain city names to area code data associations.

Module: is.pl (Iceland)

This module provides support for Iceland; international country code +354. Validation includes basic length and assigned range check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code IS is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: nz.pl (New Zealand)

This module provides support for New Zealand; international country code +64. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code NZ is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: gb.pl (United Kingdom)

This module provides support for United Kingdom; international country code +44. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code GB is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: lu.pl (Luxembourg)

This module provides support for Luxembourg; international country code +352. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code LU is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: fr.pl (France)

This module provides support for France; international country code +33. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code FR is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: ie.pl (Ireland)

This module provides support for Ireland; international country code +353. Validation includes basic length, area code, and assigned check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code IE is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed however the internal module data does contain city names to area code data associations.

Module: li.pl (Liechtenstein)

This module provides support for Liechtenstein; international country code +423. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code LI is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: dk.pl (Denmark)

This module provides support for Denmark; international country code +45. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code DK is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: ee.pl (Estonia)

This module provides support for Estonia; international country code +372. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code EE is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: ch.pl (Switzerland)

This module provides support for Switzerland; international country code +41. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code CH is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: fo.pl (Faeroe Islands)

This module provides support for Faeroe Islands; international country code +298. Validation includes basic length check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code FO is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: be.pl (Belgium)

This module provides support for Belgium; international country code +32. Validation includes basic length check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code BE is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: ad.pl (Andorra)

This module provides support for Andorra; international country code +376. Validation includes basic length check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code AD is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed.

Module: au.pl (Australia)

This module provides support for Australia; international country code +61. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code AU is assumed. Note, due to Perl's parameter passing methodology, this field must be passed in order for the optional state field to be recognized.

\$state

Optional parameter specifying Australian state abbreviation. When present will validate the telephone area code at the state. *See Appendix C for recognized values.*

Module: nl.pl (Netherlands)

This module provides support for Netherlands; international country code +31. Validation includes basic length and area code check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

Telephone numbers in the Netherlands contain a 2 to 3 digit area code (NDC) followed by a 7 to 8 digit subscriber number (*National Significant Number*). The area code is always validated at the national level. The formatted telephone number is always returned using international format.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code NL is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed however the internal module data does contain city names to area code data associations.

Module: no.pl (Norway)

This module provides support for Norway, international country code +47. Validation includes basic length and national number range check for the telephone number. The number may be specified in either international or national format. Internally, the module will always convert the number to national format for validation.

Telephone numbers in Norway contain are 8 digits. Area codes are not used however validation is performed checking the subscriber number range. For example the number range 21000000 to 21099999 identifies valid Oslo telephone numbers. The formatted telephone number is always returned using international format.

:: isPhone(\$x_phone,\$iso,\$state)

Parameters:

\$x_phone

Telephone number to validate and format. The number may be passed with or without delimiters and may be specified using national or international format.

\$iso

Optional parameter, ISO 3166 alpha 2 country code NO is assumed.

\$state

Optional parameter, currently ignored. No regional or city level validation is performed however the internal module data does contain city names to area code data associations.

Appendix A: United States state and Canadian province abbreviations

United States Postal Service state and territory abbreviations used and recognized by the North American telephone module us.pl.

USPS Abbreviation	State or Territory Name
AL	Alabama
AK	Alaska
AZ	Arizona
AR	Arkansas
AS	American Samoa
CA	California
CO	Colorado
CT	Connecticut
DE	Delaware
DC	District of Columbia
FL	Florida
FM	Federated States of Micronesia
GA	Georgia
GU	Guam
HI	Hawaii
ID	Idaho
IL	Illinois
IN	Indiana
IA	Iowa
KS	Kansas
KY	Kentucky
LA	Louisiana
ME	Maine
MD	Maryland
MA	Massachusetts
MH	Marshall Islands
MI	Michigan
MN	Minnesota
MP	Northern Mariana Islands
MS	Mississippi
MO	Missouri
MT	Montana
NE	Nebraska
NV	Nevada
NH	New Hampshire
NJ	New Jersey
NM	New Mexico
NY	New York
NC	North Carolina
ND	North Dakota
OH	Ohio
OK	Oklahoma
OR	Oregon
PA	Pennsylvania
PR	Puerto Rico
PW	Palau

RI	Rhode Island
SC	South Carolina
SD	South Dakota
TN	Tennessee
TX	Texas
UT	Utah
VT	Vermont
VI	Virgin Islands
VA	Virginia
WA	Washington
WV	West Virginia
WI	Wisconsin
WY	Wyoming

Canada Post province and territory abbreviations used and recognized by the North American telephone module us.pl.

Canada Post Abbreviation	Province or Territory Name
AB	Alberta
BC	British Columbia
MB	Manitoba
NB	New Brunswick
NL	Newfoundland and Labrador
NS	Nova Scotia
NT	Northwest Territories
NU	Nunavut
ON	Ontario
PE	Prince Edward Island
QC	Quebec
SK	Saskatchewan
YT	Yukon

Appendix B: Mexico state abbreviations

Mexico state and territory abbreviations used and recognized by the Mexico telephone module mx.pl.

State Abbreviation	State or Territory Name
AGS	Aguascalientes
BCN	Baja California Norte
BCS	Baja California Sur
CAM	Campeche
COAH	Coahuila de Zaragoza
COL	Colima
CHIS	Chiapas
CHIH	Chihuahua
DF	Distrito Federal
DGO	Durango
GTO	Guanajuato
GRO	Guerrero
HGO	Hidalgo
JAL	Jalisco
MEX	México (Estado de)
MICH	Michoacán de Ocampo
MOR	Morelos
NAY	Nayarit
NL	Nuevo León
OAX	Oaxaca
PUE	Puebla
QRO	Querétaro Arteaga
QROO	Quintana Roo
SLP	San Luís Potosí
SIN	Sinalóa
SON	Sonora
TAB	Tabasco
TAMPS	Tamaulipas
TLAX	Tlaxcala
VER	Veracruz
YUC	Yucatán
ZAC	Zacatecas

Appendix C: Australia state abbreviations

Australia state and territory abbreviations used and recognized by the Australia telephone module au.pl.

State Abbreviation	State or Territory Name
ACT	Australian Capital Territory
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
SA	South Australia
TAS	Tasmania
VIC	Victoria
WA	Western Australia