



# Inhaltsverzeichnis

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## Modul:Convert/wikidata/sandbox

Die Dokumentation für dieses Modul kann unter [Modul:Convert/wikidata/sandbox/Doku](#) erstellt werden

```
-- Functions to access Wikidata for Module:Convert.

local Collection = {}
Collection.__index = Collection
do
    function Collection:add(item)
        if item ~= nil then
            self.n = self.n + 1
            self[self.n] = item
        end
    end
    function Collection:join(sep)
        return table.concat(self, sep)
    end
    function Collection:remove(pos)
        if self.n > 0 and (pos == nil or (0 < pos and pos <= self.n)) then
            self.n = self.n - 1
            return table.remove(self, pos)
        end
    end
    function Collection:sort(comp)
        table.sort(self, comp)
    end
    function Collection.new()
        return setmetatable({n = 0}, Collection)
    end
end

local function strip_to_nil(text)
    -- If text is a non-empty string, return its trimmed content,
    -- otherwise return nothing (empty string or not a string).
    if type(text) == 'string' then
        return text:match('%S.-)%s*$')
    end
end

local function frequency_unit(value, unit_table)
    -- For use when converting m to Hz.
    -- Return true, s where s = name of unit's default output unit,
    -- or return false, t where t is an error message table.
    -- However, for simplicity a valid result is always returned.
    local unit
    if unit_table._symbol == 'm' then
        -- c = speed of light in a vacuum = 299792458 m/s
        -- frequency = c / wavelength
        local w = value * (unit_table.scale or 1)
        local f = 299792458 / w -- if w == 0, f = math.huge which works
        if f >= 1e12 then
            unit = 'THz'
        elseif f >= 1e9 then
            unit = 'GHz'
        elseif f >= 1e6 then
            unit = 'MHz'
        elseif f >= 1e3 then
            unit = 'kHz'
        end
    end
end
```

```
                unit = 'kHz'
            else
                unit = 'Hz'
            end
        end
    end
    return true, unit or 'Hz'
end

local function wavelength_unit(value, unit_table)
    -- Like frequency_unit but for use when converting Hz to m.
    local unit
    if unit_table._symbol == 'Hz' then
        -- Using 0.9993 rather than 1 avoids rounding which would give re
        -- like converting 300 MHz to 100 cm instead of 1 m.
        local w = 1 / (value * (unit_table.scale or 1)) -- Hz scale is 1
        if w >= 0.9993e6 then
            unit = 'Mm'
        elseif w >= 0.9993e3 then
            unit = 'km'
        elseif w >= 0.9993 then
            unit = 'm'
        elseif w >= 0.9993e-2 then
            unit = 'cm'
        elseif w >= 0.9993e-3 then
            unit = 'mm'
        else
            unit = 'um'
        end
    end
    return true, unit or 'm'
end

local specials = {
    frequency = { frequency_unit },
    wavelength = { wavelength_unit },
    -----
    -- Following is a removed experiment to show two values as a range
    -- using '-' as the separator.
    -- frequencyrange = { frequency_unit, '-' },
    -- wavelengthrange = { wavelength_unit, '-' },
}

local function make_unit(units, parms, uid)
    -- Return a unit code for convert or nil if unit unknown.
    -- If necessary, add a dummy unit to parms so convert will use it
    -- for the input without attempting a conversion since nothing
    -- useful is available (for example, with unit volt).
    local unit = units[uid]
    if type(unit) ~= 'table' then
        return nil
    end
    local ucode = unit.ucode
    if ucode and not unit.si then
        return ucode -- a unit known to convert
    end
    parms.opt_ignore_error = true
    ucode = ucode or unit._ucode -- must be a non-empty string
    local ukey, utable
    if unit.si then
        local base = units[unit.si]
        ukey = base.symbol -- must be a non-empty string
        local n1 = base.name1
        local n2 = base.name2
        if not n1 then
```

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        n1 = ukey
        n2 = n2 or n1          -- do not append 's'
    end
    utable = {
        _symbol = ukey,
        _name1 = n1,
        _name2 = n2,
        link = unit.link or base.link,
        utype = n1,
        prefixes = 1,
    }
else
    ukey = ucode
    utable = {
        symbol = ucode,          -- must be a non-empty string
        name1 = unit.name1,     -- if nil, uses symbol
        name2 = unit.name2,     -- if nil, uses name1..'s'
        link = unit.link,       -- if nil, uses name1
        utype = unit.name1 or ucode,
    }
end
utable.scale = 1
utable.default = ''
utable.defkey = ''
utable.linkey = ''
utable.bad_mcode = ''
parms.unittable = { [ukey] = utable }
return ucode
end

local function matches_qualifier(statement, qual)
    -- Return:
    -- false, nil : if statement does not match specification
    -- true, nil  : if matches, and statement has no qualifier
    -- true, sq   : if matches, where sq is the statement's qualifier
    -- A match means that no qualifier was specified (qual == nil), or that
    -- the statement has a qualifier matching the specification.
    -- If a match occurs, the caller needs the statement's qualifier (if any)
    -- so statements that duplicate the qualifier are not used, after the first
    -- Then, if convert is showing all values for a property such as the diameter
    -- of a telescope's mirror (diameters of primary and secondary mirrors),
    -- will not show alternative values that could in principle be present for
    -- same item (telescope) and property (diameter) and qualifier (primary/secondary)
    local target = (statement.qualifiers or {}).P518 -- P518 is "applies to"
    if type(target) == 'table' then
        for _, q in ipairs(target) do
            if type(q) == 'table' then
                local value = (q.datavalue or {}).value
                if value then
                    if qual == nil or qual == value.id then
                        return true, value.id
                    end
                end
            end
        end
    end
    if qual == nil then
        return true, nil -- only occurs if statement has no qualifier
    end
    return false, nil -- statement's qualifier is not relevant because statement
end

local function get_statements(parms, pid)
    -- Get specified item and return a list of tables with each statement for
```

```
-- Each table is of form {statqual=sq, stmt=statement} where sq = statement
-- Statements are in Wikidata's order except that those with preferred rank
-- are first, then normal rank. Any other rank is ignored.
local stored = {} -- qualifiers of statements that are first for the quality
local qid = strip_to_nil(params.qid) -- nil for current page's item, or a
local qual = strip_to_nil(params.qual) -- nil or id of wanted P518 (applies)
local result = Collection.new()
local entity = mw.wikibase.getEntity(qid)
if type(entity) == 'table' then
    local statements = (entity.claims or {})[qid]
    if type(statements) == 'table' then
        for _, rank in ipairs({ 'preferred', 'normal' }) do
            for _, statement in ipairs(statements) do
                if type(statement) == 'table' and rank ==
                    local is_match, statqual = match
                    if is_match then
                        result:add({ statqual = s
                    end
                end
            end
        end
    end
end
return result
end

local function input_from_property(tdata, params, pid)
-- Given that pid is a Wikidata property identifier like 'P123',
-- return a collection of {amount, ucode} pairs (two strings)
-- for each matching item/property, or return nothing.
-----
-- There appear to be few restrictions on how Wikidata is organized so it
-- very likely that any decision a module makes about how to handle data
-- will be wrong for some cases at some time. This meets current requirem
-- For each qualifier (or if no qualifier), if there are any preferred
-- statements, use them and ignore any normal statements.
-- For each qualifier, for the preferred statements if any, or for
-- the normal statements (but not both):
-- * Accept each statement if it has no qualifier (this will not occur
-- if qual=x is specified because other code already ensures that in th
-- case, only statements with a qualifier matching x are considered).
-- * Ignore any statements after the first if it has a qualifier.
-- The rationale is that for the diameter at [[South Pole Telescope]], wa
-- convert to show the diameters for both the primary and secondary mirro
-- if the convert does not specify which diameter is wanted.
-- However, if convert is given the wanted qualifier, only one value
-- (the diameter) is wanted. For simplicity/consistency, that is also c
-- even if no qual=x is specified. Unclear what should happen.
-- For the wavelength at [[Nançay Radio Telescope]], want to show all th
-- values, and the values have no qualifiers.
-----
local result = Collection.new()
local done = {}
local skip_normal
for _, t in ipairs(get_statements(params, pid)) do
    local statement = t.stmt
    if statement.mainsnak and statement.mainsnak.datatype == 'quantit
        local value = (statement.mainsnak.datavalue or {}).value
        if value then
            local amount = value.amount
            if amount then
                amount = tostring(amount) -- in case am
                if amount:sub(1, 1) == '+' then
                    amount = amount:sub(2)
                end
            end
        end
    end
end
return result
end
```



```
    if special then
        parms.out_unit = special[1]
        sep = special[2] or sep
        table.remove(parms, index)
    end
    local function quit()
        return false, pid and { 'cvt_no_output' } or { 'cvt_bad_input', t
    end
    local function insert2(first, second)
        table.insert(parms, index, second)
        table.insert(parms, index, first)
    end
    if pid then
        parms.input_text = '' -- output an empty string if an error occur
        local result = input_from_property(tdata, parms, pid)
        if result.n == 0 then
            return quit()
        end
        local ucode
        for i, t in ipairs(result) do
            -- Convert requires each input unit to be identical.
            if i == 1 then
                ucode = t[2]
            elseif ucode ~= t[2] then
                return quit()
            end
        end
        local item = ucode
        if item == parms[index] then
            -- Remove specified output unit if it is the same as the
            -- For example, {{convert|input=P2044|km}} with property
            table.remove(parms, index)
        end
        for i = result.n, 1, -1 do
            insert2(result[i][1], item)
            item = sep
        end
        return true
    else
        if input_from_text(tdata, parms, text, insert2) then
            return true
        end
    end
    return quit()
end

-----
--- List units and check syntax of definitions -----
-----
local specifications = {
    -- seq = sequence in which fields are displayed
    base = {
        title = 'SI base units',
        fields = {
            symbol = { seq = 2, mandatory = true },
            name1 = { seq = 3, mandatory = true },
            name2 = { seq = 4 },
            link = { seq = 5 },
        },
        noteseq = 6,
        header = '{| class="wikitable"\n!si !!symbol !!name1 !!name2 !!l
        item = '|-\n|%s ||%s ||%s ||%s ||%s ||%s',
        footer = '|}',
    },
},
```

```
alias = {
  title = 'Aliases for convert',
  fields = {
    ucode = { seq = 2, mandatory = true },
    si     = { seq = 3 },
  },
  noteseq = 4,
  header = '{| class="wikitable"\n!alias !!ucode !!base !!note',
  item = '|-\n|%s ||%s ||%s ||%s',
  footer = '|}',
},
known = {
  title = 'Units known to convert',
  fields = {
    ucode = { seq = 2, mandatory = true },
    label = { seq = 3, mandatory = true },
  },
  noteseq = 4,
  header = '{| class="wikitable"\n!qid !!ucode !!label !!note',
  item = '|-\n|%s ||%s ||%s ||%s',
  footer = '|}',
},
unknown = {
  title = 'Units not known to convert',
  fields = {
    _ucode = { seq = 2, mandatory = true },
    si     = { seq = 3 },
    name1  = { seq = 4 },
    name2  = { seq = 5 },
    link   = { seq = 6 },
    label  = { seq = 7, mandatory = true },
  },
  noteseq = 8,
  header = '{| class="wikitable"\n!qid !!_ucode !!base !!name1 !!name2 !!link !!label',
  item = '|-\n|%s ||%s ||%s ||%s ||%s ||%s ||%s ||%s',
  footer = '|}',
},
}

local function listunits(tdata, ulookup)
-- For Module:Convert, make wikitext to list the built-in Wikidata units
-- Return true, wikitext if successful or return false, t where t is an
-- error message table. Currently, an error return never occurs.
-- The syntax of each unit definition is checked and a note is added if
-- a problem is detected.
local function safe_cells(t)
-- This is not currently needed, but in case definitions ever use
-- like '[[kilogram|kg]]', escape the text so it works in a table
local result = {}
for i, v in ipairs(t) do
  if v:find('|', 1, true) then
    v = v:gsub('%[[^%[[^%]]-]|(.-%]])', '%1\0%2')
    v = v:gsub('|', '&#124;')
    v = v:gsub('%z', '|')
  end
  result[i] = v:gsub('{', '&#123;') --
end
return unpack(result)
end
local wdunits = tdata.wikidata_units
local speckey = { 'base', 'alias', 'unknown', 'known' }
for _, sid in ipairs(speckey) do
  specifications[sid].units = Collection.new()
end
end
```

```
local keys = Collection.new()
for k, v in pairs(wdunits) do
    keys:add(k)
end
table.sort(keys)
local note_count = 0
for _, key in ipairs(keys) do
    local unit = wdunits[key]
    local ktext, sid
    if key:match('^Q%d+$') then
        ktext = '[[d:' .. key .. '|' .. key .. ']]'
        if unit.unicode then
            sid = 'known'
        else
            sid = 'unknown'
        end
    elseif unit.unicode then
        ktext = key
        sid = 'alias'
    else
        ktext = key
        sid = 'base'
    end
    local result = { ktext }
    local spec = specifications[sid]
    local fields = spec.fields
    local note = Collection.new()
    for k, v in pairs(unit) do
        if fields[k] then
            local seq = fields[k].seq
            if result[seq] then
                note:add('duplicate ' .. k) -- cannot ha
            else
                result[seq] = v
            end
        else
            note:add('invalid ' .. k)
        end
    end
    for k, v in pairs(fields) do
        local value = result[v.seq]
        if value then
            if k == 'si' and not wdunits[value] then
                note:add('need si ' .. value)
            end
            if k == 'label' then
                local wdl = mw.wikibase.getLabel(key)
                if wdl ~= value then
                    note:add('label changed to ' .. t
                end
            end
        else
            result[v.seq] = ''
            if v.mandatory then
                note:add('missing ' .. k)
            end
        end
    end
    local text
    if note.n > 0 then
        note_count = note_count + 1
        text = '*' .. note:join('<br />')
    end
    result[spec.noteseq] = text or ''
end
```

```
        spec.units:add(result)
    end
    local results = Collection.new()
    if note_count > 0 then
        local text = note_count .. (note_count == 1 and ' note' or ' notes')
        results:add("''Search for * to see " .. text .. ""'\n")
    end
    for _, sid in ipairs(speckey) do
        local spec = specifications[sid]
        results:add("''" .. spec.title .. "'")
        results:add(spec.header)
        local fmt = spec.item
        for _, unit in ipairs(spec.units) do
            results:add(string.format(fmt, safe_cells(unit)))
        end
        results:add(spec.footer)
    end
    return true, results:join('\n')
end

return { _adjustparameters = adjustparameters, _listunits = listunits }
```