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**CANADIAN PAYROLL TAX LIBRARY (CPTL)**



**Windows DLL**

**SDK & API**  
**ver. 2014A.2**

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CPTL_API	2014A.2	05-Apr-2014

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## Document History

<b>Version</b>	<b>Issued by</b>	<b>Issue Date</b>	<b>Comments</b>
0.1	K. Kortje	19 Sep 2005	Original documentation draft
0.2	KK	26 Sep 2005	Corrections to some employee data structure fieldnames and date field formats.
0.3	KK	07 Oct 2005	Added fields to employee data structure for return values of pensionable (CPP) and insurable (EI) earnings. Added functions for obtaining max annual CPP pensionable & EI insurable earnings. Added functions for obtaining applicable taxation year and effective date for CPTL library.
0.4	KK	15 Nov 2005	Added functions for obtaining upper range values of TD1 and TD1P claim codes.
2006A.1.0	KK	21 Dec 2005	Added functions for indexing TD1/TD1P Claim amounts from previous year.
2006B.2.0	KK	30 Oct 2006	Revised employee data structure; added new functions for obtaining TD1 and TD1P claim codes based on related Total Claim amounts.
2007A.0.1	KK	27 Nov 2006	Update version references; Minor formatting chgs.
2008A.1	KK	12 Dec 2007	Update version references; Minor formatting chgs.
2009A	KK	28 Dec 2008	Update version references;
2010A.1	KK	18 Dec 2009	Update version references;
2011A.1	KK	12 Nov 2010	Update version references; added new wrapper DLL to manage calls to appropriate CPTL version DLL based on payroll payment date; New fields added to EMP_DATA structure used with CPTL_CalcDeductions() function; New public CPTL class methods available to calling programs in managed code .NET environment.
2012A.1	KK	15 Dec 2011	Update version references;
2012A.2	KK	06 Mar 2012	Update version references; revised EMP_DATA structure; Added fields LSFp_P and employeeEIreturnable; Removed fields dedPPIP, PPIP_earnings & employerPPIPcost.
2013A.1	KK	15 Dec 2012	Update version references;
2014A.1	KK	10 Dec 2013	Update version references;
2014A.2	KK	05 Apr 2014	Updated for v2014A.2 changes to CPTL wrapper; Revised some function parameter names; Corrected CPTL_Get_Max_EI() missing parameter for 'province'; Other minor documentation corrections.
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## Overview

The Canadian Payroll Tax Library (CPTL) is a Canadian payroll tax deduction calculation engine that will accurately calculate the amount of statutory employee payroll withholdings/deductions required by the Canada Revenue Agency (CRA) on any type of employee payroll payment, including regular salary & wages, pension income, bonuses, retroactive pay increases and/or commission income payments. CPTL will calculate deductions for Canada Pension Plan (CPP) contributions, Employment Insurance (EI) premiums, federal income taxes and provincial (except Quebec) income taxes. CPTL can perform calculations for any type of pay period definition, including daily, weekly, bi-weekly, semi-monthly, and monthly. CPTL does not calculate additional deductions required and administered by the province of Quebec, however a separate Quebec Payroll Taxes Library (QPTL) module is available for performing Quebec payroll deduction calculations.

CPTL is distributed as a set of library (Windows DLL or Linux shared library) files, which can be incorporated into any application software program capable of making function calls to an external Windows library.

CPTL is ideal for application program developers who need to compute Canadian payroll tax withholding deductions but do not want to devote the programming resources necessary to develop, maintain and test such programs or the time and effort to monitor and stay up-to-date with ever-changing Canadian payroll tax legislation, or who lack the necessary Canadian income tax expertise to ensure proper compliance with complicated Canadian payroll tax requirements.

CPTL was developed by a Canadian Chartered Accountant with over 30 years of accounting, tax and payroll experience, and is based on Canada Revenue Agency publication T4127 - Payroll Deductions Formulas for Computer Programs.

CPTL is available for both the Windows and Linux operating system platforms. In addition, CPTL is available as a Java JAR file.

CPTL is also available as a Web Service API. Software developers interested in licensing the CPTL Web Service may register for a free test account at [www.metca.com](http://www.metca.com), or alternatively, send an email requesting more information to [cptl@metca.com](mailto:cptl@metca.com).

For Quebec payroll deduction calculations, the Quebec Payroll Tax Library (QPTL) is available as an add-on to CPTL. Software developers interested in licensing QPTL may register to download a free test version at [www.metca.com](http://www.metca.com), or alternatively, send an email requesting more information to [qptl@metca.com](mailto:qptl@metca.com).

MET also publishes **webTOD**, a free online Canadian Payroll Tax Deduction calculator, which can be accessed at [www.webtod.ca](http://www.webtod.ca). **webTOD** is ideal for Canadian employers and/or employees who need to quickly calculate accurate payroll deductions – all that's needed is a computer with Internet access and a web-browser – no software download is required.

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## System Requirements

CPTL can be installed and run on any of the following operating system platforms:

- Windows Server 2003<sup>®</sup>
- Windows XP<sup>®</sup>
- Windows Vista<sup>®</sup>
- Windows 7<sup>®</sup>
- Windows 8<sup>®</sup>

## Installation – Windows DLL

To install the CPTL library for Windows, copy the .LIB files that are included with the SDK to the subdirectory containing your application program .LIB files and copy the .DLL files, also included with the SDK, to a subdirectory somewhere in your Windows search path (the same subdirectory as your application executable OR the Windows system directory are recommended).

Once installed, the CPTL library can then be accessed in either of two methods:

1. Include the CPTL in your binary executable program by linking to the **CPTL32.LIB** (or CPTL64.LIB for 64-bit systems) file. Make sure the file **CPTL32.DLL** (or CPTL64.DLL for 64-bit systems) is somewhere in your Windows search path).

OR

2. Load CPTL at runtime by using the Windows functions LoadLibrary() and GetProcAddress() in your application source code, and using the procedure pointer returned by GetProcAddress() to call the CPTL functions.

OR

3. Load CPTL at runtime to your .NET application by adding a reference to the CPTL32.DLL (or CPTL64.DLL for 64-bit systems) file, and accessing the public class CPTL and its associated public methods.

## Installation – Linux shared library

(See separate documentation for Linux)

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## **CPTL Interface – CPTL class Public Methods**

The CPTL interface provides a set of 17 public methods that may be used by a calling program.  
(see separate documentation in Class\_CPTL\_v2014A.pdf)



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## CPTL Interface – External Functions

The CPTL interface provides a set of 17 external functions that may be used by a calling program. These external functions can be called as an alternative to the CPTL class public methods. The following table lists each of the available function calls:

Function Name	Description
CPTL_Version	Returns the CPTL Version number.
CPTL_TaxYear	Returns the applicable calendar taxation year for which the CPTL version may be used. New versions of CPTL are released for each new calendar taxation year.
CPTL_EffDate	Returns the date on which the rates, limits and amounts calculated by the CPTL library version become effective. New versions of CPTL may be released that are effective for a later date in the same calendar taxation year. Typically, a new CPTL version will be released on January 1 and July 1 of each calendar taxation year.
CPTL_Last_ErrorNum	Returns the most recent error number.
CPTL_Get_TD1_Claim	Returns the associated federal TD1 Claim Amount for a specified 'Claim Code'. Use Claim Code = 1 to obtain the Basic Federal Claim Amount.
CPTL_Get_TD1_ClaimRange	Returns the associated upper range value of federal TD1 Claim Amounts for a specified 'Claim Code'. This function can be used to build a list of TD1 Claim Ranges and associated Claim Codes.
CPTL_Get_TD1_ClaimCode	Returns the associated federal TD1 'Claim Code' for a specified TD1 Total Claim Amount. This function can be used to obtain the appropriate federal 'Claim Code' to store in an employee's payroll record based on the Total Claim Amount from the employee's completed TD1 form.
CPTL_Calc_Indexed_TD1_Claim	Calculates the indexed value of an employee's TD1 Total Claim Amount, based on the employee's Total Claim Amount from the previous tax year. This function can be used to calculate new TD1 Claim Amounts for employees at the beginning of each tax year.
CPTL_Get_TD1P_Claim	Returns the associated provincial TD1P Claim Amount for a specified province and 'Claim Code'. Use Claim Code = 1 to obtain the Basic Provincial Claim Amount.
CPTL_Get_TD1P_ClaimRange	Returns the associated upper range value of provincial TD1P Claim Amounts for a specified 'Claim Code'. This function can be used to build a list of TD1P Claim Ranges and associated Claim Codes.

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Function Name	Description
CPTL_Get_TD1P_ClaimCode	Returns the associated provincial/territorial TD1P 'Claim Code' for a specified TD1P Total Claim Amount. This function can be used to obtain the appropriate provincial 'Claim Code' to store in an employee's payroll record based on the Total Claim Amount from the employee's completed TD1P form.
CPTL_Calc_Indexed_TD1P_Claim	Calculates the indexed value of an employee's TD1P Total Claim Amount, based on the employee's Total Claim Amount from the previous tax year. This function can be used to calculate new TD1P Claim Amounts for employees at the beginning of each tax year.
CPTL_Get_Max_CPP	Returns the maximum annual CPP contribution amount.
CPTL_Get_Max_CPPearnings	Returns the maximum annual CPP pensionable earnings amount.
CPTL_Get_Max_EI	Returns the maximum annual EI premium amount.
CPTL_Get_Max_EIearnings	Returns the maximum annual EI insurable earnings amount.
<b>CPTL_CalcDeductions</b>	<b>Performs payroll deduction calculations using the input data in the Employee data structure passed to the function as a parameter.</b>

The most important and useful function is the CPTL\_CalcDeductions() function. This function performs a payroll deduction calculation based on a set of input data defined in a data structure that is passed by reference into the function, and returns calculated deduction values by updating specified calculation result data fields within that same data structure.

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## Function descriptions

### CPTL\_Version

#### Windows Usage:

```
WORD WINAPI CPTL_Version(LPSTR psVersion);
```

The CPTL\_Version() function will store the current version number for the CPTL library in the *psVersion* parameter, which is passed by reference (pointer) to the function. The version number will be in a format similar to the following:

CPTL.2014A.1

The version number string will contain the 'CPTL' identifying string, the applicable calendar tax year, the calendar year update identifier (usually, A = Jan 1 update; B=Jul 1 update), and a version release number, which is used for minor updates and bug fixes.

Function returns: **CPTL\_OK**

### CPTL\_TaxYear

#### Windows Usage:

```
WORD WINAPI CPTL_TaxYear(LONG* pTaxYear);
```

The CPTL\_TaxYear function will store the applicable calendar taxation year in the *pTaxYear* parameter, which is passed by reference (pointer) to the function. The CPTL version should not be used for pay dates subsequent to this calendar year, or for pay dates that are more than three (3) years previous. e.g. if value of *pTaxYear* returned is 2014, valid pay dates are in calendar years 2011 to 2014.

Function returns: **CPTL\_OK**

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#### CPTL\_EffDate

##### Windows Usage:

```
WORD WINAPI CPTL_EffDate(LPSTR psEffDate);
```

The CPTL\_EffDate function will store the applicable effective date for the CPTL library version in the *psEffDate* parameter, which is passed by reference (pointer) to the function. The date format returned by CPTL is **YYYY-MM-DD** (e.g. 2014-01-01).

Note: Beginning with version CPTL.2011A.1, the CPTL library will include tax calculations for dates PREVIOUS to the effective date, including all payroll dates in the current and immediately three (3) preceding tax years. Prior to version CPTL.2011A.1, the CPTL library should not be used for pay dates preceding the effective date.

Function returns: **CPTL\_OK**

#### CPTL\_Last\_ErrorNum

##### Windows Usage:

```
WORD WINAPI CPTL_Last_ErrorNum(void);
```

The CPTL\_Last\_ErrorNum() function returns the last error number encountered in the library.

A list of all error numbers and definitions is shown in **Appendix A**.

#### CPTL\_Get\_TD1\_Claim

##### Windows Usage:

```
WORD WINAPI CPTL_Get_TD1_Claim(WORD claimCode, LONG *TD1_Claim_Amount,  
[LPCSTR lpszPayDate]);
```

The CPTL\_Get\_TD1\_Claim() function will store the associated federal TD1 Claim Amount for a specified *claimCode* in the parameter *TD1\_Claim\_Amount*, which is passed by reference (pointer) to the function. Use *claimCode* = 1 to obtain the Basic Federal Claim Amount. Use this function to obtain the federal Total Claim (TC) amount associated with a specified TD1 Claim Code. The value for *TD1\_Claim\_Amount* is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 11138.00 will be stored in *TD1\_Claim\_Amount* as 1113800.

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The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 TD1 claim amounts can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_TD1\_CLAIM\_CODE** if an invalid *claimCode* value is passed.  
Valid *claimCode* values are 0-10.

**CPTL\_ERROR\_PAYDATE** if an invalid pay date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

#### **CPTL\_Get\_TD1\_ClaimRange**

Windows Usage:

```
WORD WINAPI CPTL_Get_TD1_ClaimRange(WORD claimCode, LONG  
*TD1_Claim_Range, [LPCSTR lpszPayDate]);
```

The `CPTL_Get_TD1_ClaimRange()` function will store the upper range value of federal TD1 Claim Amounts for a specified *claimCode* in the parameter *TD1\_Claim\_Range*, which is passed by reference (pointer) to the function. The value for *TD1\_Claim\_Range* is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 11138.00 will be stored in *TD1\_Claim\_Range* as 1113800. This value can be used to build a list of the TD1 Claim Ranges associated with each TD1 Claim Code.

The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 TD1 claim ranges can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

Function returns:

**CPTL\_OK** if successful

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**CPTL\_ERROR\_TD1\_CLAIM\_CODE** if an invalid *claimCode* value is passed.  
 Valid *claimCode* values are 0-10.

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter  
*lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter  
*lpszPayDate* that is in a future tax year. This indicates that an  
 updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter  
*lpszPayDate* that is in a tax year prior to the earliest tax year  
 supported by CPTL (currently 2011). This indicates that a previous  
 version of CPTL is required.

<b>CPTL_Get_TD1_ClaimCode</b>
-------------------------------

**Windows Usage:**

```
WORD WINAPI CPTL_Get_TD1_ClaimCode(LONG TD1_Claim_Amount, WORD*
    claimCode, [LPCSTR lpszPayDate]);
```

The `CPTL_Get_TD1_ClaimCode()` function will store the associated federal TD1 Claim Code for a specified `TD1_Claim_Amount` in the parameter *claimCode*, which is passed by reference (pointer) to the function. Use this function to obtain the appropriate federal TD1 claim code for a specified Total Claim amount from an employee's federal TD1 form. The value for `TD1_Claim_Amount` must be provided WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 11138.00 should be stored in `TD1_Claim_Amount` as 1113800. The returned value for *claimCode* will be 0-10.

Claim codes are sometimes used in an employee's payroll information record instead of the actual TD1 Total Claim amount because claim codes do not need to be indexed in subsequent years, whereas Total Claim amounts must be indexed to obtain updated amounts for subsequent years. For example, an employee with a federal claim code of 4 will remain claim code 4 in subsequent years (unless the employee files a new updated TD1 form), and there is no need to update the employee's payroll information record. However, if the employee's payroll information record contains the actual Total Claim amount from the TD1 form (instead of the associated Claim Code), the Total Claim amount must be updated each time the TD1 form claim amounts are revised, including the annual indexing of the claim amounts.

The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 TD1 claim codes can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

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Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

<b>CPTL_Calc_Indexed_TD1_Claim</b>
------------------------------------

Windows Usage:

```
WORD WINAPI CPTL_Calc_Indexed_TD1_Claim (LONG TD1_BaseClaim, LONG
    TD1_NoIndex_Amount, LONG *TD1_Claim_Amount, [LPCSTR
    lpszPayDate]);
```

The `CPTL_Calc_Indexed_TD1_Claim()` function calculates the indexed value of the federal TD1 Claim Amount, based on the previous year total claim amount (`LONG TD1_BaseClaim`) and the previous year non-indexable claim amount (`LONG TD1_NoIndex_Amount`). The calculated value can be used as the employee's new TD1 Total Claim amount if the employee does not file a new TD1 form at the beginning of a new calendar year. If the employee does not wish to make any changes to the amounts claimed on his/her previous year TD1 form, the employer is not required to obtain a new TD1 form from the employee – but must recalculate the TD1 Claim Amount to use for the employee in payroll calculations by applying an indexing formula. This function will apply the indexing formula and provide the new TD1 Total Claim amount that should be stored on the employee's payroll record. The calculated indexed TD1 Claim Amount value is stored in the parameter `TD1_Claim_Amount`, which is passed by reference (pointer) to the function. The values for `TD1_BaseClaim` and `TD1_NoIndex_Amount` must be provided WITHOUT a decimal point, rounded to the nearest penny - e.g. the value 11038.00 should be stored in `TD1_BaseClaim` as 1103800. The value for `TD1_Claim_Amount` is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 11138.00 will be stored in `TD1_Claim_Amount` as 1113800.

The optional parameter `lpszPayDate` can be used to specify a payroll date previous to the current tax year (e.g. 2013 indexed TD1 claim amounts can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

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Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

<b>CPTL_Get_TD1P_Claim</b>
----------------------------

Windows Usage:

```
WORD WINAPI CPTL_Get_TD1P_Claim(WORD province, WORD claimCode, LONG  
*TD1P_Claim_Amount, [LPCSTR lpszPayDate]);
```

The `CPTL_Get_TD1P_Claim()` function will store the associated provincial TD1P Claim Amount for a specified *province* and *claimCode* in the parameter *TD1P\_Claim\_Amount*, which is passed by reference (pointer) to the function. Use *claimCode* = 1 to obtain the Basic Provincial Claim Amount. Use this function to obtain the provincial Total Claim (TCP) amount associated with a specified TD1P Claim Code. The value for *TD1P\_Claim\_Amount* is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 9869.00 will be stored in *TD1P\_Claim\_Amount* as 986900.

The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 TD1P claim amounts can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PROV** if an invalid *province* value is passed. See the *province* field documentation of the employee data structure for a list of valid *province* values, which range from 1-15.

**CPTL\_ERROR\_TD1P\_CLAIM\_CODE** if an invalid *claimCode* value is passed.



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**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

#### CPTL\_Get\_TD1P\_ClaimRange

##### Windows Usage:

```
WORD WINAPI CPTL_Get_TD1P_Claim(WORD province, WORD claimCode, LONG  
*TD1P_Claim_Range, [LPCSTR lpszPayDate]);
```

The `CPTL_Get_TD1P_ClaimRange()` function will store the upper range value of provincial TD1P Claim Amounts for a specified *province* and *claimCode* in the parameter *TD1P\_Claim\_Range*, which is passed by reference (pointer) to the function. The value for *TD1P\_Claim\_Range* is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 9869.00 will be stored in *TD1P\_Claim\_Range* as 986900. This value can be used to build a list of the TD1P Claim Ranges associated with each TD1P Claim Code.

The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 TD1P claim ranges can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

##### Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PROV** if an invalid *province* value is passed. See the *province* field documentation of the employee data structure for a list of valid *province* values, which range from 1-15.

**CPTL\_ERROR\_TD1P\_CLAIM\_CODE** if an invalid *claimCode* value is passed.

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

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**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

#### CPTL\_Get\_TD1P\_ClaimCode

##### Windows Usage:

```
WORD WINAPI CPTL_Get_TD1P_ClaimCode(WORD province, LONG  
    TD1P_Claim_Amount, WORD* claimCode, [LPCSTR lpszPayDate]);
```

The `CPTL_Get_TD1P_ClaimCode()` function will store the associated provincial TD1P Claim Code for a specified *province* and *TD1P\_Claim\_Amount* in the parameter *claimCode*, which is passed by reference (pointer) to the function. Use this function to obtain the appropriate provincial TD1P claim code for a specified Total Claim amount from an employee's provincial TD1P form. The value for *TD1P\_Claim\_Amount* must be provided WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 9869.00 should be stored in *TD1P\_Claim\_Amount* as 986900. The returned value for *claimCode* will be 0-10.

Claim codes are sometimes used in an employee's payroll information record instead of the actual TD1P Total Claim amount because claim codes do not need to be indexed in subsequent years, whereas Total Claim amounts must be indexed to obtain updated amounts for subsequent years. For example, an employee with a provincial claim code of 4 will remain claim code 4 in subsequent years (unless the employee files a new updated TD1P form), and there is no need to update the employee's payroll information record. However, if the employee's payroll information record contains the actual Total Claim amount from the TD1P form (instead of the associated Claim Code), the Total Claim amount must be updated each time the TD1P form claim amounts are revised, including the annual indexing of the claim amounts.

The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 TD1P claim codes can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

##### Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PROV** if an invalid *province* value is passed. See the *province* field documentation of the employee data structure for a list of valid *province* values, which range from 1-15.

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**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

<b>CPTL_Calc_Indexed_TD1P_Claim</b>
-------------------------------------

**Windows Usage:**

```
WORD WINAPI CPTL_Calc_Indexed_TD1P_Claim (WORD province, LONG
    TD1P_BaseClaim, LONG TD1P_NoIndex_Amount, LONG
    *TD1P_Claim_Amount [, LPCSTR lpszPayDate]);
```

The `CPTL_Calc_Indexed_TD1P_Claim()` function calculates the indexed value of the provincial TD1P Claim Amount for a specified *province*, based on the previous year total claim amount (`LONG TD1P_BaseClaim`) and the previous year non-indexable claim amount (`LONG TD1P_NoIndex_Amount`). The calculated value can be used as the employee's new TD1P Total Claim amount if the employee does not file a new TD1P form at the beginning of a new calendar year. If the employee does not wish to make any changes to the amounts claimed on his/her previous year TD1P form, the employer is not required to obtain a new TD1P form from the employee – but must recalculate the TD1P Claim Amount to use for the employee in payroll calculations by applying an indexing formula. This function will apply the indexing formula and provide the new TD1P Total Claim amount that should be stored on the employee's payroll record. The calculated indexed TD1P Claim Amount value is stored in the parameter *TD1P\_Claim\_Amount*, which is passed by reference (pointer) to the function. The values for *TD1P\_BaseClaim* and *TD1P\_NoIndex\_Amount* must be provided WITHOUT a decimal point, rounded to the nearest penny - – e.g. the value 10276.00 should be stored in *TD1\_BaseClaim* as 1027600. The value for *TD1P\_Claim\_Amount* is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 9869.00 will be stored in *TD1P\_Claim\_Amount* as 986900.

The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 indexed TD1P claim amounts can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

Function returns:

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**CPTL\_OK** if successful

**CPTL\_ERROR\_PROV** if an invalid *province* value is passed. See the province field documentation of the employee data structure for a list of valid *province* values, which range from 1-15.

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

#### CPTL\_Get\_Max\_CPP

##### Windows Usage:

```
WORD WINAPI CPTL_Get_Max_CPP(LONG *Max_CPP_Amount [, LPCSTR  
    lpszPayDate]);
```

The `CPTL_Get_Max_CPP()` function returns the maximum annual Canada Pension Plan (CPP) contribution for an employee in the parameter `LONG *Max_CPP_Amount`, which is passed by reference (pointer) to the function. The value for `Max_CPP_Amount` is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 2,425.50 will be stored in `Max_CPP_Amount` as 242550.

The optional parameter `lpszPayDate` can be used to specify a payroll date previous to the current tax year (e.g. 2013 maximum CPP amounts can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

##### Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

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**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpzPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

#### **CPTL\_Get\_Max\_CPEarnings**

##### Windows Usage:

```
WORD WINAPI CPTL_Get_Max_CPEarnings(LONG *Max_CPEarnings_Amount [,  
    LPCSTR lpzPayDate]);
```

The `CPTL_Get_Max_CPEarnings` function returns the maximum annual CPP pensionable earnings for an employee in the parameter `LONG *Max_CPEarnings_Amount`, which is passed by reference (pointer) to the function. The value for `Max_CPEarnings_Amount` is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 52,500.00 will be stored in `Max_CPEarnings_Amount` as 5250000.

The optional parameter *lpzPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 maximum CPP earnings amount can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

##### Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpzPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpzPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpzPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

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#### CPTL\_Get\_Max\_EI

##### Windows Usage:

```
WORD WINAPI CPTL_Get_Max_EI(WORD province, LONG *Max_EI_Amount [,  
    LPCSTR lpszPayDate]);
```

The CPTL\_Get\_Max\_EI() function returns the maximum annual employee deduction for Employment Insurance (EI) premiums for a specified *province* in the parameter LONG *\*Max\_EI\_Amount*, which is passed by reference (pointer) to the function. The value for *Max\_EI\_Amount* is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 913.68 will be stored in *Max\_EI\_Amount* as 91368.

The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 maximum EI amounts can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

##### Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

#### CPTL\_Get\_Max\_EIearnings

##### Windows Usage:

```
WORD WINAPI CPTL_Get_Max_EIearnings(LONG *Max_EIearnings_Amount [,  
    LPCSTR lpszPayDate]);
```

The CPTL\_Get\_Max\_EIearnings function returns the maximum annual EI insurable earnings for an employee in the parameter LONG *\*Max\_EIearnings\_Amount*, which is passed by reference (pointer) to the function. The value for *Max\_EIearnings\_Amount* is returned

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WITHOUT a decimal point, rounded to the nearest penny – e.g. the value 48,600.00 will be stored in *Max\_EIearnings\_Amount* as 4860000.

The optional parameter *lpszPayDate* can be used to specify a payroll date previous to the current tax year (e.g. 2013 maximum EI earnings amount can be retrieved even if the current tax year is 2014). If the parameter is omitted, a default value equal to the current effective date for CPTL will be used.

Function returns:

**CPTL\_OK** if successful

**CPTL\_ERROR\_PAYDATE** if an invalid date value is passed in parameter *lpszPayDate*.

**CPTL\_WARNING\_PAYDATE\_EXPIRED\_VER** if a date value is passed in parameter *lpszPayDate* that is in a future tax year. This indicates that an updated version of CPTL is required.

**CPTL\_WARNING\_PAYDATE\_PRIOR\_VER** if a date value is passed in parameter *lpszPayDate* that is in a tax year prior to the earliest tax year supported by CPTL (currently 2011). This indicates that a previous version of CPTL is required.

#### **CPTL\_CalcDeductions**

Windows Usage:

```
WORD WINAPI CPTL_CalcDeductions(EMP_DATA *empInfo);
```

The *CPTL\_CalcDeductions()* function performs payroll deduction calculations using the input data in the *empInfo* parameter. The *empInfo* parameter is a data structure containing the applicable employee data for the requested payroll tax deduction calculation. The resulting calculated deductions are then stored in an output data section of the *empInfo* data structure.

Function returns:

**CPTL\_OK** if successful

A list of all error numbers and definitions is shown in Appendix A.

The structure of the *empInfo* parameter is defined by the *EMP\_DATA* data structure and is detailed in the following section.

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## Employee Data Structure

Each call to the CPTL function **CPTL\_CalcDeductions()** requires a single parameter which is a pointer to a data structure that defines all of the data fields for an employee that are required to calculate the related payroll deductions. This data structure also contains fields allocated to receive the results of each payroll deduction calculation. The C/C++ and Visual Basic versions of this data structure are shown below:

### C/C++

```
typedef struct EMP_DATA {
    WORD        province;
    WORD        annualPayPeriods;
    LPCSTR      birthdate;
    LONG        TD1_Claim;
    WORD        TD1_exemptITD;
    LONG        TD1_HD;
    LONG        TD1_L;
    LONG        CRA_F1;
    LONG        CRA_K3;
    LONG        TD1X_I1;
    LONG        TD1X_E;
    LONG        TD1P_Claim;
    WORD        TD1P_exemptITD;
    LONG        CRA_K3P;
    LONG        CRA_Y;
    WORD        isCPPexempt;
    WORD        isEIexempt;
    WORD        isPPIPexempt;
    double      employer_EI_ratefactor;
    LONG        ytdCPP;
    LONG        ytdEI;
    LONG        ytdPPIP;
    LONG        ytdPPIP_employer;
    LONG        ytdITD;
    LONG        ytdLSFp;
    WORD        LSFp_P;
    WORD        calcType;
    WORD        payPeriod;
    WORD        cntPP;
    LPCSTR      payDate;
    LONG        wagesAmount;
    LONG        pensionAmount;
    LONG        vacationPayAmount;
    LONG        bonusAmount;
    LONG        ytdPrevBonusAmount;
    LONG        retroPayAmount;
    WORD        retroPayPeriods;
    LONG        commAmount;
    WORD        daysSincePrevCommPmt;
    LONG        txCashBenefitsAmount;
    LONG        txNonCashBenefitsAmount;
    LONG        dedF;
    LONG        dedU1;
}
```



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```

LONG      dedF2;
LONG      bonusDeductions;
LONG      retroDeductions;
LONG      dedCPP;                // calculated return value
LONG      dedEI;                // calculated return value
LONG      dedITD;               // calculated return value
LONG      dedITD_Fed;          // calculated return value
LONG      dedITD_Prov;         // calculated return value
LONG      CPP_Earnings;        // calculated return value
LONG      EI_Earnings;         // calculated return value
LONG      employerCPPcost;     // calculated return value
LONG      employerEICost;      // calculated return value
LONG      employerEIreturnable; // calculated return value

```

```
} EMP_DATA, FAR *EMP_DATA_Ptr;
```

Note: WORD is an unsigned 16-bit integer; LONG is a 32-bit integer; LPCSTR is a character String;

### Visual Basic

```

Public Type empData
    province As Integer           'Prov of employment
    annualPayPeriods As Integer  '# of annual pay periods
    birthDate As String          'Birth date - format YYYY-MM-DD
    TD1_Claim As Long            'TD1 Total Claim Amount or Claim Code (0-10)
    TD1_exemptITD As Integer     'Exemption from federal tax deductions
    TD1_HD As Long              'TD1 claim for living in prescribed zone
    TD1_L As Long               'TD1 requested additional tax deduction
    CRA_F1 As Long              'CRA authorized annual deduction from taxable income
    CRA_K3 As Long              'CRA authorized additional federal personal tax credits
    TD1X_I1 As Long             'TD1X estimated annual commission income
    TD1X_E As Long             'TD1X estimated annual commission expenses
    TD1P_Claim As Long          'TD1P Total Claim Amount or Claim Code (0-10)
    TD1P_exemptITD As Integer   'Exemption from provincial tax deductions
    CRA_K3P As Long            'CRA authorized additional provincial personal tax credits
    CRA_Y As Long              'Manitoba tax reduction Y factor
    isCPPexempt As Integer      'CPP/QPP exemption
    isEIexempt As Integer       'EI exemption
    isPPIPexempt As Integer     'PPIP/QPIP exemption
    employer_EI_ratefactor As Double 'Reduced employer EI contribution factor
    (null/blank = default = 1.4)
    ytdCPP As Long             'Year-to-date CPP/QPP deductions
    ytdEI As Long             'Year-to-date EI deductions
    ytdPPIP As Long           'Year-to-date PPIP/QPIP deductions
    ytdPPIP_employer As Long   'Year-to-date PPIP/QPIP employer contributions
    ytdITD As Long            'Year-to-date CRA tax deductions
    ytdLSFp As Long           'Year-to-date purchases of qualified labour-sponsored funds
    LSFp_P As Integer         'Number of pay periods for allocation of calculated LSF tax
    credit (accelerated method)
    calcType As Integer        'Calculation type (1-5)
    payPeriod As Integer       'Current pay period number
    cntPP As Integer          'Number of pay periods covered by current payroll
    payDate As String         'Current pay date

```

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wagesAmount As Long 'Current pay period wages/salary amount  
 pensionAmount As Long 'Current pay period pension income amount  
 vacationPayAmount As Long 'Current pay period vacation pay amount  
 bonusAmount As Long 'Current pay period bonus amount  
 ytdPrevBonusAmount As Long 'Year-to-date previous bonus amounts  
 retroPayAmount As Long 'Current pay period retroactive pay amount  
 retroPayPeriods As Integer 'Number of applicable retroactive pay periods  
 commAmount As Long 'Current pay period commission amount  
 daysSincePrevCommPmt As Integer 'Days since previous commission payment  
 txCashBenefitsAmount As Long 'Current pay period taxable cash benefits amt  
 txNonCashBenefitsAmount As Long 'Current pay period taxable non-cash benefits  
 dedF As Long 'Current pay period deduction for RPP/RRSP contributions  
 dedU1 As Long 'Current pay period deduction for union dues  
 dedF2 As Long 'Current pay period deduction for alimony/family maint  
 bonusDeductions As Long 'Current pay period deductions from bonus payment  
 retroDeductions As Long 'Current pay period deductions from retro pay  
 dedCPP As Long 'Calculated - Current pay period CPP deduction  
 dedEI As Long 'Calculated - Current pay period EI deduction  
 dedITD As Long 'Calculated - Current pay period Income Tax deduction  
 dedITD\_Fed As Long 'Calculated - Federal portion of dedITD  
 dedITD\_Prov As Long 'Calculated - Provincial portion of dedITD  
 CPP\_Earnings As Long 'Calculated - Current pay period CPP earnings  
 EI\_Earnings As Long 'Calculated - Current pay period CPP earnings  
 employerCPPcost As Long 'Calculated - Current employer CPP/QPP cost  
 employerEICost As Long 'Calculated - Current employer EI contribution cost  
 employerEIreturnable As Long 'Calculated - Current employer EI cost savings  
 returnable to employee

End Type

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## Employee Data Structure Field Descriptions

**WORD province;**

Valid values are 1-15. Enter the appropriate value to indicate the employee's province of employment:

Value	Abbrev.	Province
1	AB	Alberta
2	BC	British Columbia
3	MB	Manitoba
4	NB	New Brunswick
5	NL	Newfoundland/Labrador
6	NS	Nova Scotia
7	NT	Northwest Territories
8	NU	Nunavut
9	ON	Ontario
10	PE	Prince Edward Island
11	QC	Quebec
12	SK	Saskatchewan
13	YT	Yukon
14	NR	Non-resident
15	NA	Cdn. resident outside a province e.g. Cdn. overseas military personnel

**WORD annualPayPeriods;**

Valid values are 0-260. Enter the appropriate value to indicate the number of pay periods per year for the employee. For all payroll deduction calculations, the pay period definition must correspond to the period for which the related income is being paid. The following values are the most commonly used:

Value	Pay period definition
260	Daily
240	Daily
53	Weekly
52	Weekly
27	Bi-weekly (53 week year)
26	Bi-weekly (52 week year)
24	Semi-monthly
13	4 weeks
12	Monthly
6	Bi-monthly

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Value	Pay period definition
4	Quarterly
2	Semi-annual
1	Annual
0	Commission income only

Note: For pay periods that occur over less-than a one year period (e.g. teachers paid over a 10-month period), enter the total number of pay periods that will be paid – e.g. semi-monthly over 10 months = 20 pay periods per annum.

**LPCSTR birthDate;**

Enter the employee's birth date in the format **YYYY-MM-DD**. If the employee's birth date is not known, enter an empty (NULL) string. The birth date is used only to determine if the employee is eligible for an age-related exemption from CPP. Employees aged less than 18 or older than 69 (i.e. age 70 and older) are not required to make CPP contributions. (Note: CPTL versions prior to 2006B.2 required a date format of MM/DD/YYYY)

**LONG TD1\_Claim;**

Enter the total claim amount from the employee's federal TD1 form. If the employee has not completed a federal TD1 form, enter the value 1, which will result in the default Basic Claim Amount being used for payroll calculations. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 10,000.00 should be entered as 1000000.

Note: as of version 2006B.2, any valid TD1 Claim Code may be entered in this field, and it will automatically be converted to the appropriate related federal Total Claim amount. Values of 0 – 10 entered in this field will be assumed by CPTL to be a Claim Code. Values > 10 but less than the current default federal Basic Claim amount will be automatically converted to the default federal Basic Claim amount. Values > the current federal Basic Claim amount will be treated by CPTL as actual Total Claim amounts.

**WORD TD1\_exemptITD;**

If an employee will not earn more than the Total Claim amount on his/her federal TD1 form, they may request that no income tax deductions be made from their payroll payments by indicating this on the TD1 form. If the employee has completed and filed a federal TD1 form with the employer and made this declaration, CPTL can be configured to not calculate a federal income tax deduction by entering a value of 1 in this field. Otherwise, the default value of 0 should be used.

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**LONG TD1\_HD;**

Enter the amount of the annual deduction for living in a prescribed zone as indicated on the federal TD1 form. If no amount is claimed, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 1,000.00 should be entered as 100000.

**LONG TD1\_L;**

Enter the amount of additional income tax deductions per pay period requested by the employee on his/her federal TD1 form. If no additional amount is requested, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 50.00 should be entered as 5000.

**LONG CRA\_F1;**

Enter the amount of annual taxable deductions, such as childcare expenses and support payments, etc., authorized by a tax services office or tax centre. The employee must have a letter from a tax office authorizing this deduction amount on file with the employer. If no amount is claimed, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 2,000.00 should be entered as 200000.

**LONG CRA\_K3;**

Enter the amount of other federal tax credits, such as medical expenses and charitable donations, authorized by a tax services office or tax centre. If no amount is claimed, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 2,000.00 should be entered as 200000.

**LONG TD1X\_I1;**

For commissioned employees, enter the amount of the total annual remuneration as reported on the employee's federal TD1(X) form. If a commission income deduction calculation (calcType=5) is being performed, the amount in this field must be greater than 0. If the employee is not remunerated by commission income, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 50,000.00 should be entered as 5000000.

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**LONG TD1X\_E;**

For commissioned employees, enter the amount of the total annual commission expenses deduction as reported on the employee's federal TD1(X) form. If the employee is not remunerated by commission income, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 10,000.00 should be entered as 1000000.

**LONG TD1P\_Claim;**

Enter the total claim amount from the employee's provincial TD1P form. If the employee has not completed a provincial TD1P form, enter the value 1, which will result in the default Basic Claim Amount being used for payroll calculations. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 10,000.00 should be entered as 1000000.

Note: as of version 2006B.2, any valid TD1P Claim Code may be entered in this field, and it will automatically be converted to the appropriate related provincial/territorial Total Claim amount. Values of 0 – 10 entered in this field will be assumed by CPTL to be a Claim Code. Values > 10 but less than the current default provincial Basic Claim amount will be automatically converted to the default provincial Basic Claim amount. Values > the current provincial Basic Claim amount will be treated by CPTL as actual Total Claim amounts.

**WORD TD1P\_exemptITD;**

If an employee will not earn more than the Total Claim amount on his/her provincial/territorial TD1P form, they may request that no income tax deductions be made from their payroll payments by indicating this on the TD1P form. If the employee has completed and filed a provincial/territorial TD1P form with the employer and made this declaration, CPTL can be configured to not calculate a provincial/territorial income tax deduction by entering a value of 1 in this field. Otherwise, the default value of 0 should be used.

**LONG CRA\_K3P;**

Enter the amount of other provincial or territorial tax credits, such as medical expenses and charitable donations, authorized by a tax services office or tax centre. If no amount is claimed, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 2,000.00 should be entered as 200000.

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**LONG CRA\_Y;**

Enter the amount of additional provincial or territorial tax reduction based on applicable amounts reported on the provincial/territorial Form TD1P. If no amount is claimed, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 2,000.00 should be entered as 200000.

**WORD isCPPexempt;**

If the employee is exempt from contributing to Canada Pension Plan (CPP), enter 1 (true), otherwise enter 0 (false). If unknown, enter 0 (false). The CPTL program can determine age-related exemptions to CPP automatically if the birth date for the employee is provided in the **birthDate** field.

**WORD isEIexempt;**

If the employee is exempt from paying Employment Insurance (EI) premiums, enter 1 (true), otherwise enter 0 (false). If unknown, enter 0 (false).

**WORD isPPIPexempt;**

If a Quebec employee is exempt from paying Quebec Parental Insurance Plan (PPIP) premiums, enter 1 (true), otherwise enter 0 (false). If unknown, enter 0 (false). Note: Currently, this factor applies only in the province of Quebec, therefore for all other provinces, the value should be 0 (false).

**double employer\_EI\_ratefactor;**

If an employer has qualified for a reduced EI contribution rate factor, enter the reduced employer EI rate. This amount will be used to determine the employer's EI contribution cost and the amount of EI deduction that is returnable to the employee. If unknown, enter a Null value, and the default EI employer contribution factor (1.4) will be assumed. Enter the amount WITH a decimal point – e.g. 1.4 should be entered as 1.4.

**LONG ytdCPP;**

Enter the total amount of year-to-date deductions of Canada Pension Plan (CPP) contributions for the employee. This amount will be used to determine if the employee has reached the

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maximum contribution limit for the year. If unknown, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 200.00 should be entered as 20000.

**LONG ytdEI;**

Enter the total amount of year-to-date deductions of Employment Insurance (EI) premiums for the employee. This amount will be used to determine if the employee has reached the maximum deduction limit for the year. If unknown, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 200.00 should be entered as 20000.

**LONG ytdPPIP;**

Enter the total amount of year-to-date deductions of Quebec Parental Insurance Plan (QPIP) premiums for the employee (Quebec employees only). This amount will be used to determine if the employee has reached the maximum premium deduction limit for the year. If unknown, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 200.00 should be entered as 20000. Note: Only the province of Quebec administers this program, therefore the value in this field for employees of all other provinces should be 0.

**LONG ytdPPIP\_employer;**

Enter the total amount of year-to-date employer contributions to Quebec Parental Insurance Plan (QPIP) premiums for the employee (Quebec employees only). This amount will be used to determine if the employer has reached the maximum premium contribution limit for the year. If unknown, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 200.00 should be entered as 20000. Note: Only the province of Quebec administers this program, therefore the value in this field for employees of all other provinces should be 0.

**LONG ytdITD;**

Enter the total amount of year-to-date deductions of Income Taxes withheld for the employee. This amount will be used to determine if the employee's current payroll income tax deduction can be reduced by an over-deduction on previous payrolls. If unknown, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 5,000.00 should be entered as 50000.



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**LONG ytdLSFp;**

Enter the total amount of year-to-date purchases of units of eligible labour-sponsored funds for the employee. This amount will be used to determine the applicable tax credit that can be used to reduce income taxes payable for the year. If unknown, enter 0. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 1,000.00 should be entered as 100000.

**WORD LSFp\_P;**

Enter the total number of pay periods for allocation of the calculated annual Labour-Sponsored Funds (LSF) credit using the accelerated method approved by CRA. If unknown, or if the accelerated method is not applicable, enter 0.

### CURRENT PAYROLL PERIOD FIELDS

**WORD calcType;**

Enter the integer value corresponding to the appropriate type of income on which the payroll deduction calculation will be performed:

Value	Payroll income type
1	Regular salary &/or wages
2	Pension income
3	Bonus income
4	Retroactive Pay Increase
5	Commission income

**WORD payPeriod;**

Enter the integer value of the current Pay Period number – i.e. the number corresponding to the position of the current pay period within the total number of pay periods in the year. This is an optional field and is used to calculate the number of remaining pay periods in the current year. If the current pay period number is not known or not used, enter a value of 0. If year-to-date deduction values have been provided and you wish CPTL to base income tax deductions on values calculated from the y-t-d deductions of CPP, EI, PPIP and Income taxes, then you must provide a non-zero value in this field, otherwise the y-t-d values will be ignored.

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**WORD cntPP;**

Enter the integer value of the number of pay periods being paid by the current payroll amounts, if it exceeds the default value of 1. For example, if the Pay Period definition is weekly (52 pay periods per year), and you are paying 2 weekly pay periods with the current payroll calculation, enter a value of 2. If the default value of 1 pay period is being paid, you may enter value of either 0 or 1, as a value of 0 will be assumed to indicate the default value of 1.

**LPCSTR payDate;**

Enter the date of the current payroll payment in the format **YYYY-MM-DD**. If an empty string is entered, the CPTL program will assume the current system date is the payroll payment date. (Note: CPTL versions prior to 2006B.2 required a date format of MM/DD/YYYY)

**LONG wagesAmount;**

Enter the amount of regular salary/wages paid to the employee for the defined pay period. Data entered in this field is used only when the **calcType** value is 1,3, or 4 – for other calcTypes enter 0 in this field. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 5,000.00 should be entered as 500000.

**LONG pensionAmount;**

Enter the amount of pension income paid to the employee for the defined pay period. Data entered in this field is only used when the **calcType** value is 2 – for other calcTypes enter 0 in this field. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 2,000.00 should be entered as 200000.

**LONG vacationPayAmount;**

Enter the amount of vacation pay paid to the employee for the defined pay period. Data entered in this field is only used when the **calcType** value is 1,3 or 4 – for other calcTypes enter 0 in this field. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 100.00 should be entered as 10000.

**LONG bonusAmount;**

Enter the amount of the current bonus to be paid to the employee for the defined pay period. Data entered in this field is only used when the **calcType** value is 3 – for other calcTypes enter

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0 in this field. Note that a bonus deduction calculation (**calcType=3**) also requires that amounts be entered for **wagesAmount**, **annualPayPeriods** and **ytdPrevBonusAmount**. The **wagesAmount** and **annualPayPeriods** data will only be used to estimate annual taxable income for purposes of determining tax rates applicable to the bonus income. The calculated payroll deductions will apply ONLY to the bonus amount entered in this field. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 1,000.00 should be entered as 100000.

**LONG ytdPrevBonusAmount;**

Enter the total amount of year-to-date previous bonuses paid to the employee (NOT including the current bonus being paid). Data entered in this field is only used when the **calcType** value is 3 – for other **calcTypes** enter 0 in this field. Note that a bonus deduction calculation (**calcType=3**) also requires that amounts be entered for **wagesAmount**, **annualPayPeriods** and **bonusAmount**. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 10,000.00 should be entered as 1000000.

**LONG retroPayAmount;**

Enter the total amount of retroactive pay paid to the employee. Data entered in this field is only used when the **calcType** value is 4 – for other **calcTypes** enter 0 in this field. Note that a retroactive pay deduction calculation (**calcType=4**) also requires that amounts be entered for **wagesAmount**, **annualPayPeriods** and **retroPayPeriods**. The **wagesAmount** and **annualPayPeriods** data will only be used to estimate annual taxable income for purposes of determining tax rates applicable to the retroactive pay income. The calculated payroll deductions will apply ONLY to the retroactive pay amount entered in this field. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 1,000.00 should be entered as 100000.

**WORD retroPayPeriods;**

Enter the number of pay periods to which the total retroactive pay amount is applicable for the employee. Data entered in this field is only used when the **calcType** value is 4 – for other **calcTypes** enter 0 in this field. Note that a retroactive pay deduction calculation (**calcType=4**) also requires that amounts be entered for **wagesAmount**, **annualPayPeriods** and **retroPayAmount**.

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**LONG commAmount;**

Enter the amount of the current commission payment to the employee. Data entered in this field is only used when the **calcType** value is 5 – for other calcTypes enter 0 in this field. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 10,000.00 should be entered as 1000000

Note that a commission income deduction calculation (**calcType=5**) also requires that amounts be entered for **TD1X\_I1**, **TD1X\_E**, and **daysSincePrevCommPmt**.

**WORD daysSincePrevCommPmt;**

Enter the number of days since the previous commission payment during the current calendar year. Data entered in this field is only used when the **calcType** value is 5 – for other calcTypes enter 0 in this field. If this is the first commission payment of the calendar year, enter 0. Note that a commission income deduction calculation (**calcType=5**) also requires that amounts be entered for **TD1X\_I1**, **TD1X\_E**, and **commAmount**.

**LONG txCashBenefitsAmount;**

Enter the amount of taxable cash benefits paid to the employee for the defined current pay period. Data entered in this field can be used with any **calcType** value. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 100.00 should be entered as 10000.

**LONG txNonCashBenefitsAmount;**

Enter the amount of taxable non-cash benefits provided to the employee for the defined current pay period. Data entered in this field can be used with any **calcType** value. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 200.00 should be entered as 20000.

**LONG dedF;**

Enter the amount of the current payroll deduction(s) for employee contributions to a registered pension plan (RPP), a registered retirement savings plan (RRSP), or a retirement compensation arrangement (RCA). Data entered in this field can be used with any **calcType** value. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 300.00 should be entered as 30000.

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**LONG dedU1;**

Enter the amount of the current payroll deduction(s) for union dues. Data entered in this field can be used with any **calcType** value. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 10.00 should be entered as 1000.

**LONG dedF2;**

Enter the amount of the current payroll deduction(s) for alimony or family maintenance payments required by a legal document to be payroll-deducted. Data entered in this field can be used with any **calcType** value. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 100.00 should be entered as 10000.

**LONG bonusDeductions;**

Enter the amount of the current payroll deduction(s) (e.g. RRSP/RPP, union dues, alimony or family maintenance) applicable only to the current bonus payment. Data entered in this field is only used when the **calcType** value is 3 (Bonus payments) – for other calcTypes enter 0 in this field. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 100.00 should be entered as 10000.

**LONG retroDeductions;**

Enter the amount of the current payroll deduction(s) (e.g. RRSP/RPP, union dues, alimony or family maintenance) applicable only to the current retroactive pay payment. Data entered in this field is only used when the **calcType** value is 4 (Retroactive pay payments) – for other calcTypes enter 0 in this field. Enter the amount WITHOUT a decimal point - 2 decimal points are assumed – e.g. 100.00 should be entered as 10000.

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## RETURN VALUES

<b>LONG dedCPP;</b>	<b>RETURN VALUE</b>
---------------------	---------------------

This is the return value for the amount of the calculated Canada (or Quebec) Pension Plan (CPP/QPP) deduction. The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 40.00 is returned as 4000.

<b>LONG dedEI;</b>	<b>RETURN VALUE</b>
--------------------	---------------------

This is the return value for the amount of the calculated Employment Insurance (IE) deduction. The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 30.00 is returned as 3000.

Note: the field **dedPPIP** was REMOVED from the data structure commencing with v2012A.2 because the amount is not a deduction to be remitted to CRA. It is only calculated and remitted as a deduction to Revenu Quebec when the province of employment is Quebec. The Quebec Payroll Tax Library (QPTL) calculates and returns this field value, therefore it is redundant in CPTL.

<b>LONG dedITD;</b>	<b>RETURN VALUE</b>
---------------------	---------------------

This is the return value for the amount of the calculated Income Tax deduction. The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 500.00 is returned as 50000.

<b>LONG dedITD_Fed;</b>	<b>RETURN VALUE</b>
-------------------------	---------------------

This is the return value for the amount of the federal portion of the total calculated Income Tax deduction. The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 300.00 is returned as 30000.

<b>LONG dedITD_Prov;</b>	<b>RETURN VALUE</b>
--------------------------	---------------------

This is the return value for the amount of the provincial portion of the total calculated Income Tax deduction. The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 150.00 is returned as 15000.

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Note: the field **dedITD\_Add** was REMOVED from the data structure commencing with v2006B.2 because the amount is redundant – it is the same amount as the value in the field TD1\_L.

<b>LONG CPP_Earnings;</b>	<b>RETURN VALUE</b>
---------------------------	---------------------

This is the return value for the total amount of CPP pensionable earnings calculated by CPTL, on which the current calculated deduction for CPP contributions is based. This amount should be used to accumulate year-to-date totals of CPP pensionable earnings for each employee, which will be required for year-end employee tax reporting (T4). The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 100.00 is returned as 10000.

<b>LONG EI_Earnings;</b>	<b>RETURN VALUE</b>
--------------------------	---------------------

This is the return value for the total amount of EI insurable earnings calculated by CPTL, on which the current calculated deduction for EI premiums is based. This amount should be used to accumulate year-to-date totals of EI insurable earnings for each employee, which will be required for year-end employee tax reporting (T4). The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 100.00 is returned as 10000.

Note: the field **PPIP\_Earnings** was REMOVED from the data structure commencing with v2012A.2 because the amount is not relevant to a deduction to be remitted to CRA. It is only calculated and relevant to the QPIP deduction to be remitted to Revenu Quebec when the province of employment is Quebec. The Quebec Payroll Tax Library (QPTL) calculates and returns this field value, therefore it is redundant in CPTL.

<b>LONG employerCPPcost;</b>	<b>RETURN VALUE</b>
------------------------------	---------------------

This is the return value for the calculated amount of the employer Canada (or Quebec) Pension Plan (CPP/QPP) contribution based on the employee's contributed (payroll deducted) amount. As of January 1, 2014, the employer contribution remains as an amount equal to the employee payroll deducted contribution. The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 40.00 is returned as 4000.

<b>LONG employerEICost;</b>	<b>RETURN VALUE</b>
-----------------------------	---------------------

This is the return value for the calculated amount of the employer portion of Employment Insurance (EI) premiums based on the employee's premium amount. As of January 1, 2014, the employer portion remains as an amount equal to 1.4 times the employee payroll deducted

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premium. The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 40.00 is returned as 4000.

<b>LONG employeeEIreturnable;</b>	<b>RETURN VALUE</b>
-----------------------------------	---------------------

This is the return value for the calculated amount of the employer EI cost savings that are returnable to an employee when an employer is eligible for a reduced EI rate. The amount is returned WITHOUT a decimal point, rounded to the nearest penny – e.g. 40.00 is returned as 4000.

Note: the field **employerPPIPcost** was REMOVED from the data structure commencing with v2012A.2 because the amount is not relevant to a deduction to be remitted to CRA. It is only calculated and relevant to the QPIP deduction to be remitted to Revenu Quebec when the province of employment is Quebec. The Quebec Payroll Tax Library (QPTL) calculates and returns this field value, therefore it is redundant in CPTL.



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## Simple Visual Basic Demo Program

The CPTL SDK includes a simple example of a Visual Basic program that utilizes the CPTL DLL in a VB project file named CPTL\_Demo\_Simple.vbp.

Open the CPTL\_Demo\_Simple.vbp project in the Visual Basic (VB6 SP3 or above) editor to see an example of how to call the CPTL functions from within a Visual Basic application.

The project contains a simple program with a general module (Declarations) that declares the CPTL DLL as an external function library and defines the employee data structure, and a form (CalcSimpleResults) that initializes the employee data structure, calls the CPTL\_CalcDeductions() function to calculate an employee's payroll deductions based on data stored in the employee data structure, and displays the results on the user's screen display.

To run the program, press the F5 key from within Visual Basic, or run the compiled version of the program (CPTL\_Demo\_Simple.exe).

## Simple Visual C# Demo Program

The CPTL SDK also includes an example of a Visual C# program that utilizes the CPTL DLL in a VC# solution file named CPTL64\_TestApplication1.sln.

Open the CPTL64\_TestApplication1.sln solution in the Visual Studio editor to see an example of how to call the CPTL methods from within a Visual C# application.

The solution file's project contains a simple program (CPTL64\_TestApplication1.cs) that includes the CPTL64.dll file as a Reference, and makes calls to each of the public methods of the CPTL class, including the calcDeductions() method to calculate an employee's payroll deductions based on data stored in the employee data structure, and outputs the results to a Windows console window.

To run the program, press the F5 key from within the VC# CPTL64\_TestApplication1.sln solution (Start with Debugging).

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### **Appendix A - Error Codes (returned by CPTL exported functions)**

Error code values 0-10 are non-critical warnings only – i.e. the CPTL engine will complete all deduction calculations. Error code values >10 are critical errors – CPTL will be unable to complete the deduction calculations or related functions.

<b>Value</b>	<b>C #define value</b>	<b>Definition/description</b>
0	CPTL_OK	Function and related calculations completed without errors.
1	CPTL_WARNING_EXPIRED_VERSION	The current system date is past the expiry date for the current version of the CPTL library. Please ensure that you are using the correct version of CPTL to perform payroll deduction calculations.
2	CPTL_WARNING_PAYDATE_EXPIRED_VER	The specified payroll pay date is past the expiry date for the current version of the CPTL library. Payroll deduction calculations for the specified payroll date should be performed using an updated version of CPTL.
3	CPTL_WARNING_PAYDATE_PRIOR_VER	The specified payroll pay date is prior to the effective date for the current version of the CPTL library. Payroll deduction calculations for the specified payroll pay date should be performed using a prior version of CPTL.
4	CPTL_WARNING_INVALID_BIRTHDATE	An invalid date was specified for the birthDate field of the employee data structure. CPTL has not performed any CPP age eligibility calculations – the employee has been assumed to be CPP age eligible.
11	CPTL_ERROR_TD1_CLAIM_CODE	An invalid claim code value was passed as a parameter to the CPTL_Get_TD1_Claim function. Valid claim code values are 0-10. Use claim code = 1 to claim the default Basic Federal Claim Amount.
12	CPTL_ERROR_TD1P_CLAIM_CODE	An invalid claim code value was passed as a parameter to the CPTL_Get_TD1P_Claim function. Valid claim code values are 0-10. Use claim code = 1 to claim the default Basic Provincial Claim Amount.
21	CPTL_ERROR_EMPDATA	An invalid data structure was passed to the CPTL_Calc_Deductions() function. Please ensure that the data structure conforms to the specifications detailed in the CPTL SDK / API documentation.

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Value	C #define value	Definition/description
22	CPTL_ERROR_PROV	An invalid value was used for the province field of the employee data structure. See the province field documentation of the employee data structure for a list of valid province values, which range from 1-15.
23	CPTL_ERROR_ANNUALPAYPERIODS	An invalid value was used for the annualPayPeriods field of the employee data structure. See the annualPayPeriods field documentation of the employee data structure for a list of valid annual Pay Period values, which range from 1-365 for non-commission income deduction calculations (0 is used ONLY for commission income calculations).
31	CPTL_ERROR_CALCTYPE	An invalid value was specified for the calcType field of the employee data structure. Valid values range from 1 to 5.
32	CPTL_ERROR_PAYPERIOD	An invalid value was used for the current payPeriod field of the employee data structure. Valid values range from 0 to a maximum value equal to the defined number of annual pay periods.
33	CPTL_ERROR_CNT_PP	An invalid value was used for the current payPeriod count field of the employee data structure. Valid values range from 0 to a maximum value equal to the defined number of annual pay periods minus the value of the current pay period, plus one.
34	CPTL_ERROR_PAYDATE	An invalid date was specified for the payDate field of the employee data structure. Valid dates are in the format YYYY-MM-DD. Beginning with CPTL version 2006B.2, any valid date will be accepted, but will generate a CPTL warning message (see warning codes 2 & 3) if it does not fall within the same calendar year as the applicable CPTL tax year.
35	CPTL_ERROR_RETRO_PP	An invalid value was specified for the retroPayPeriods field of the employee data structure. Valid values range from 1 to a maximum value equal to the defined number of annual pay periods.
36	CPTL_ERROR_COMM_DAYS	An invalid value was specified for the daysSincePrevCommPmt field of the employee data structure. Valid values range from 0-365.

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Value	C #define value	Definition/description
42	CPTL_ERROR_PAYDATE_EXPIRED_VER	The specified payroll pay date is past the latest tax year handled by this version of the CPTL library. Payroll deduction calculations for the specified payroll pay date should be performed using an updated version of CPTL library. Please contact MET to obtain an updated version of the CPTL library.
43	CPTL_ERROR_PAYDATE_PRIOR_VER	The specified payroll pay date is prior to the earliest tax year handled by this version of the CPTL library. Payroll deduction calculations for the specified payroll pay date should be performed using a prior version of CPTL. Please contact MET to obtain prior versions of the CPTL library.
99	CPTL_ERROR_DLL	The CPTL program was unable to load the appropriate version of the DLL corresponding to the pay date specified. Please check that all required DLL files are installed and accessible by the CPTL program.
101	CPTL_ERROR_INVALID_USERID	An invalid UserID was used with the CPTL program. Please contact MET for CPTL licensing information.
102	CPTL_ERROR_TRIAL_EXPIRED	The trial period for a demo version of CPTL has expired. Please contact MET for CPTL licensing information.