

# Trimble Business Center Smart Text Quick Reference Guide

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Smart text is made up of abbreviated codes that, combined, specify what text values are displayed in a text label or annotation. These values typically, but not always, represent dynamic measurement values for selected objects. You can enter smart text codes with the assistance of the Insert Smart Text dialog or by typing them into the Text Editor.

Smart Text Fields/Arguments (7 possible codes between the 6 commas)	
All smart text codes must start with @< and end with >@ (ampersands and angle brackets). Within the angle brackets, each smart text code must start by specifying a property type followed by two or more "arguments" that provide additional instructions specific to the selected property type. A total of seven arguments separated by commas are possible; the default/minimum is three arguments, e.g., @<SS,T,F>@. An empty argument field is the same as "F" for false.	
When numeric, the extracted property value is shown in decimal units (unless overridden in field 7).	
Default fields/arguments shown in the Smart Text dialog	
1	<b>Specifies the property type value to display.</b>  E.g., northing, elevation, length, area, etc.
2	<b>Specifies the object or location (point in 2D space) to extract the property type value from.</b>  E.g., point, line, surface, leader, or text insertion point
3	<b>Specifies whether to display the units suffix.</b>  T = true/yes, F = false/no, P = base this argument on the project setting. (Quick Access toolbar >  Project Settings > Units > Suffix)  <b>Exception: When using the surface slope code (SS) in the first field,</b> this third field controls how the slope is computed/shown. <ul style="list-style-type: none"><li><b>If the 3rd value is "T"</b> (e.g., "@&lt;SS,T,T&gt;@"), then the true triangle slope is displayed in the smart text. As you drag (move the rotation grip), the slope value does not change.</li><li><b>If the 3rd value is "F"</b>, then the slope is computed in the direction of the text. As you drag, both slope values will change as the text is moved across the surface.</li></ul>

Additional fields/arguments you can add manually	
4	<p><b>Specifies the number of decimal places to display.</b></p> <p>E.g., 1, 2...4. Blank = base this value on the project setting.</p> <p>(Quick Access toolbar &gt;  <b>Project Settings &gt; Units &gt; Decimal precision</b>)</p> <p><b>Optionally, specifies whether to add a digit grouping symbol to a numeric value</b></p> <p>E.g., format 1000.00 as 1,000.00 by adding a minus sign before the smart text code for decimal precision formatting. This does not affect the decimal precision.</p> <p><b>Exception: When using the surface elevation code (ELS) in the first field,</b> a "T" in this field gives the elevation of the difference between a point and the surface displayed. (i.e., T = displays the difference in elevation from an object to the specified surface, rather than the elevation of the surface).</p> <p><b>To display in alternate units:</b> You can add a unit specifier option to the smart text code to specify the length, area, or volume units used to display the data, overriding the default units specified in Project Settings. For example, if your Area project setting is square meter, by adding yd to the end of smart text code, you can display area units in your smart text as square yards instead of square meters. In the following example, the unit specifier option “yd” has been added to the end of the code for an area property (A) that is using the object selection option (O), display units option (T), and decimal precision option (3): @&lt;A,O,T,3,yd&gt;@</p> <p><b>To perform simple math computations:</b> Smart text supports the inclusion of simple math computations in the smart text code that are intended to modify the values displayed in the smart text (as applicable). For example, you could include a math computation option that automatically adds 6 default units to a line length displayed in the smart text. In the following example,  +6 has been added to the end of the code for a line length property (L) that is using the object selection option (O), display units option (T), and decimal precision option (3): @&lt;L,O,T,3 +6&gt;@</p> <p>E.g., if the Distance Unit setting in Project Settings is meters, 6 meters are added to the actual line length when displayed in the smart text, regardless of the unit type selected for the text display. If you had added  +6ft to the code, 6 feet would be added to the length regardless of the Distance Unit setting in Project Settings and unit type selected for the text display.</p> <p>(Quick Access toolbar &gt;  <b>Project Settings &gt; Units &gt; Distance</b>)</p>
5	<p><b>When using the smart text code for northing, easting, elevation (N,E,El), specifies whether to display a whole or fraction of the value.</b></p> <p>This is typically used for elevation so you can put a whole number on one side and the rest of the number (the decimal part) on the other side. "W" = whole part, "F" = fraction.</p> <p><b>Exception: When using the surface elevation code (ELS) in the first field,</b> this specifies whether to display the delta elevation from a point to a surface. Set field 6 (see below) to “T” (true) to switch the sign to delta elevation/to format as a difference value (use "C", "F" in the smart text).</p>
6	<p><b>When using the surface elevation code (ELS) in the first field, specifies whether to display C or F versus + or -.</b></p> <p>T = display a C for cut or F for fill following the difference in elevation, rather than a + or – preceding it.</p> <p>E.g., @&lt;ELS,LD,T,2,T,T&gt; will display &lt;value&gt;F for the fill.</p>
7	<p><b>Specifies whether to display the value in non-decimal units.</b></p> <p>E.g., FI = Feet/Inch, @&lt;ELS,LD,T,,,FI&gt;@</p> <p>Diff elev: @&lt;ELS,O,T,,T,,FI&gt;@</p>

## Properties and codes

The following property types and codes can be used to include smart text in your text labeling. You can enter them manually in the text editor, or you can select them using the Insert Smart Text dialog.

**Note:** All smart text arguments strings must start with @< and end with >@.

**Note:** Logically, only certain combinations of codes are valid. For example, you cannot extract a layer from a surface as surfaces do not have a layer property.

## Override the decimal precision

You can override the decimal precision (as set in Project Settings) for any individual, numeric smart text value. Simply add a comma and the number of decimal places within the smart text code (between the @ symbols). For example, after you have selected the smart text code to display a surface elevation of a leader point, the code will look like this in the Text Editor: @<ELS,LD,T>@. To limit the decimal precision of the elevation to one decimal place, add 1 so the code looks like this: @<ELS,LD,T,1>@

The surface elevation code also supports optional 5th and 6th arguments of T or F, where F (for false) is the default. The 5th argument, when set to T, will display the difference in elevation from the object to the specified surface, rather than the elevation of the surface. The 6th argument, when set to T, will display a C for cut or F for fill following the difference in elevation, rather than a + or – preceding it. For example: @<ELS,LD,T,2,T,T> will display 7.12F.

## Include digit group separators

You can include a "digit grouping symbol" to format (for example) "1000.00" as "1,000.00" by adding a minus sign before the smart text code for decimal precision formatting: change @<ELS,LD,T,1>@ to @<ELS,LD,T,-1>@ for example. This does not affect the decimal precision.

## Display in alternate units

You can add a unit specifier option to the smart text code to specify the length, area, or volume units used to display the data, overriding the default units specified in Project Settings. For example, if your Area Project Setting is square meter, by adding yd to the end of smart text code, you can display area units in your smart text as square yards instead of square meters. In the following example, the unit specifier option yd has been added to the end of the code for an area property (A) that is using the object selection option (O), display units option (T), and decimal precision option (3): @<A,O,T,3,yd>@ Also see the Alternate Units table below.

## Perform simple math computations

Smart text supports the inclusion of simple math computations in the smart text code that are intended to modify the values displayed in the smart text (as applicable). For example, you could include a math computation option that automatically adds 6 default units to a line length displayed in the smart text. In the following example, |+6 has been added to the end of the code for a line length property (L) that is using the object selection option (O), display units option (T), and decimal precision option (3): @<L,O,T,3|+6>@

In this example, if the Distance Unit setting in Project Settings is meters, 6 meters are added to the actual line length when displayed in the smart text, regardless of the unit type selected for the text display. If you had added |+6ft to the code, 6 feet would be added to the length regardless of the Distance Unit setting in Project Settings and unit type selected for the text display.

**Note:** If math codes are used in a project and the project is opened in a <ProductAbbrev> version prior to v5.10, the match codes are ignored. This will cause a different value to be displayed with no warning to the user.

Simple properties		
These properties support the extraction of simple measurement values for a variety of object types. The following example indicates that the smart text will specify that the length (L) of a selected object (O) is displayed along with a units suffix (T): @<L,O,T>@		
Property	Extract property from/at	Code
E = Easting N = Northing EL = Elevation S = Station/Distance along O = Offset L = Length A = Area ELL = Line elevation ELS = Surface elevation SS = Surface slope NM = Name LY = Layer FC = Feature Codes	T = Text insertion point LD = Leader point O = Object (point, line, surface, etc.)	Display units suffix: T = Yes F = No P = Use Project Setting to display the units suffix

# Object-based property

This property supports the extraction of a variety of measurement values for specific object types. The following example indicates that the smart text will specify an object-based property (OD) that displays for a selected line segment (L) a segment length (SL):  
@<OD,L,SL>@

Property	Extract property from/at	Code
OD = Object-based	<p>O = Object (point, line, surface, etc. e.g., dynaview, cut/fill map, surface volume grid.)</p> <p>L = Line</p> <p>H - Sheet</p> <p><b>Note:</b> You do not need to select a sheet when using this code. The sheet to which the smart text is being added is used.</p>	<p>For point, line, or surface, use the codes under "Simple properties" above.</p> <p><b>For cut/fill map or surface volume grid:</b></p> <p>AC = Area of cut</p> <p>AF = Area of fill</p> <p>AZ = Area of zero volume</p> <p>BD = Depth to balance</p> <p>VC = Cut volume</p> <p>VF = Fill volume</p> <p>VN = Net volume</p> <p>NSI = Name of initial surface used to create the map/grid</p> <p>NSF = Name of final surface used to create the map/grid</p> <p><b>For dynaview:</b></p> <p>SC = Scale of dynaview</p> <p>VE = Dynaview vertical exaggeration</p> <p>VS = Dynaview vertical scale</p> <p><b>For point:</b></p> <p>PCSF = Combined scale factor</p> <p>PHSF = Height scale factor</p> <p>PLAT = Latitude</p> <p>PLON = Longitude</p> <p>PSCL = Grid scale factor</p> <p>PTEA = Easting</p> <p>PTEL = Elevation</p> <p>PTHG = Height</p> <p>PTNO = Northing</p> <p><b>For line:</b></p> <p>S% = Instantaneous Slope (in percent at a point along a line)</p> <p>3DL - Segment slope length (3D length of a selected line segment)</p> <p>S: = Slope ratio</p> <p>SB = Segment bearing</p> <p>SL = Segment length (2D (planimetric) length of a selected line segment)</p> <p>SR = Segment radius</p> <p><b>For planset sheet:</b></p> <p>CT - Sheet count</p> <p>SI = Sheet number (sheet index)</p> <p>SN - Sheet Name (cross-section sheets are named by their beginning station)</p> <p><b>For takeoff site improvement - Topsoil:</b></p> <p>ET = Excess topsoil material</p> <p>CM = Excess topsoil config. method</p> <p>CP = Excess topsoil configuration parameter</p> <p>MT = Material layer thickness sum</p> <p>PN = Excess topsoil parameter name</p> <p>RI = Region identity</p> <p>SI = Site improvement name</p> <p>TR = Topsoil replacement material</p> <p>TT = Topsoil replacement thickness</p> <p><b>For takeoff site improvement - Simple subgrade:</b></p> <p>RI = Region identity</p> <p>SA = Subgrade adjustment thickness</p> <p>SI = Site improvement name</p> <p><b>For takeoff site improvement - &lt;any other type&gt;:</b></p> <p>MT = Material layer thickness sum</p> <p>RI = Region identity</p> <p>SI = Site improvement name</p> <p><b>For utility line:</b></p> <p>DE = Description</p> <p>SN = Site improvement name</p> <p>LL = Utility line length</p> <p>SL = Slope length</p> <p>S = Slope</p>

		<b>For utility node:</b> DE = Description RE = Rim elevation IE = Invert elevation SN = Site improvement name RS = Station along utility run AS = Station along alignment AO = Alignment offset
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## Project information property

This property supports the extraction of project information to include in the smart text. The following example indicates that the smart text will specify a project property (P) that displays the project's coordinate system (CSCS): @<P,CSCS>@

Property	Extract property from/at	Code
P = Project info	Not applicable	CSCS = Coordinate system name CSDN = Datum name CSPJ = Projection name CSVD = Vertical datum name CSZN = Zone name FOE = Field operators email FON = Field operators name FOP = Field operators phone FOF = Field operators fax OUE = Office email OUF = Office fax OUN = Office username OUP = Office phone PD = Project description PED = Project end date PFF = Full path of project file PFM = Modify date of project file PFN = File name of project file PN = Project name PR = Project reference number PSD = Project start date UA1 = Address 1 UA2 = Address 2 UACS = City, State UACC = Country UACE = Email UACF = Fax UACP = Phone UACW = Web UAZ Zip Code UC1 = Comment 1 UC2 = Comment 2 UC3 = Comment 3 UCN = Company name

## Alternate units

The following units are supported: length, area, and volume

Length	Area	Volume
m = Meter ift = International foot usft = US Survey foot mm = Millimeter cm = Centimeter dm = Decimeter km = Kilometer in = Inch yd = Yard mi = Mile ds = Display small dl -= Display large	m = Square meter km = Square kilometer ft = Square foot yd = Square yard ac = Acre ha = Hectare	cm = Cubic meter ml = Mega liter cf= Cubic foot cy = Cubic yard af = Acre feet



# Smart text code examples

Below are examples of common smart text code combinations that you can copy into the Smart Text Editor or Text Editor.

Text label for	Sample Codes (to cut & paste)	Meaning (label: code)
3D location of object	N: @<N,O,F>@ E: @<E,O,F>@ Z: @<EL,O,F>@	Northing label: Northing, from Object, No units suffix Easting label: Easting, from Object, No units suffix Elevation label: Elevation, from Object, No units suffix
3D location of insertion point	N: @<N,T,F>@ E: @<E,T,F>@ Z: @<EL,T,F>@	Northing label: Northing, at Text insertion point, No units suffix Easting label: Easting, at Text insertion point, No units suffix Elevation label: Elevation, at Text insertion point, No units suffix
3D location of leader end point	N: @<N,LD,F>@ E: @<E,LD,F>@ Z: @<EL,LD,F>@	Northing label: Northing, at Leader point, No units suffix Easting label: Easting, at Leader point, No units suffix Elevation label: Elevation, at Leader point, No units suffix
Sheet info	Sheet: @<OD,SN>@ @<OD,SI>@ of @<OD,CT>@	Sheet label: Object-based, Sheet name Sheet number (index) of Sheet count
Station along	Station: @<S,O,F>@ Offset: @<O,O,F>@	Station label: Station, from Object, No units suffix Offset label: Offset, from Object, No units suffix
Project info	Field contact: @<P,FOE>@ End: @<P,PED>@ File: @<P,PFF>@ Last modified: @<P,PFM>@ Web: @<P,UACW>@ @<P,UC1>@	Label: Project, Field Operators Email Label: Project, Project end date Label: Project, Full path of project file Label: Project, Modify date of project file Label: Project, Web address Label: Project, Comment 1
Volume	AC: @<OD,O,AC>@ AF: @<OD,O,AF>@ AZ: @<OD,O,AZ>@ BD: @<OD,O,BD>@ VC: @<OD,O,VC>@ VF: @<OD,O,VF>@ VN: @<OD,O,VN>@	Area of cut label: Object-based, from Object (c/f map), Area of cut Area of fill label: Object-based, from Object, Area of fill Area of zero volume, : Object-based, from Object, Area of zero volume Depth to balance label: Object-based, from Object, Depth to balance Cut volume label: Object-based, from Object, Cut volume Fill volume label: Object-based, from Object, Fill volume Net volume label: Object-based, from Object, Net volume

# Other individual codes you can copy-and-paste

Property	Sample Codes (to copy-paste)	Meaning
Elevation	Z: @<EL,T,F>@	Elevation label: Elevation, at Text insertion point, No units suffix
Station/ Distance along	Station: @<S,T,P,2>	Station label: Station, at Text insertion point, Units suffix based on project setting, use decimal Precision to two places
Offset	Offset: @<O,T,F>@	Offset label: Offset, at Text insertion point, No units suffix
Length	Length: @<L,O,F>@	Length label: Length, from Object, No units suffix
Area	Area: @<A,O,P>@	Area label: Area, from Object, Units suffix based on project setting
Line elevation	Elevation: @<ELL,T,T>@	Elevation label: Line elevation, at Text insertion point, Display units suffix
Surface elevation	Elevation: @<ELS,T,F>@	Elevation label: Surface elevation, at Text insertion point, No units suffix
Surface slope	Slope: @<SS,LD,P>@	Slope label: Surface slope, at Leader end point, Units suffix based on project setting
Name	@<NM,O>@ @<OD,O,NSI>@ @<OD,O,NSF>@ @<NM,O>@ @<OD,O,NSI>@	Name, from Object Initial surface used to create a cut/fill surface Final surface used to create a cut/fill surface Initial surface used to create a volume grid Final surface used to create a volume grid
Layer	Layer: @<LY,O>@	Layer label: Layer, from Object

Feature codes	Feature codes: @<FC,O>@	Feature codes label: Feature code, from Object
Utilities	<b>Lines/Pipes</b> <ul style="list-style-type: none"> <li>Name: @&lt;NM,O&gt;@</li> <li>Desc.: @&lt;OD,O,de&gt;@</li> <li>Site improvement name: @&lt;OD,O,SN&gt;@</li> <li>Length: @&lt;OD,O,LL&gt;@</li> <li>Slope length: @&lt;OD,O,SL&gt;@</li> <li>Slope: @&lt;OD,O,S&gt;@</li> </ul> <b>Nodes</b> <ul style="list-style-type: none"> <li>Name: @&lt;NM,O&gt;@</li> <li>Site improvement name @&lt;OD,O,SN&gt;@</li> <li>Desc.: @&lt;OD,O,DE&gt;@</li> <li>Rim: @&lt;OD,O,RE&gt;@</li> <li>Invert: @&lt;OD,O,IE&gt;@</li> <li>Station: @&lt;OD,O,RS&gt;@</li> </ul>	

For more information, see these TBC help topics: [Use Smart Text Codes within Text](#), [Smart Text Codes](#)

More Smart Text Labeling Examples	
Description	Smart Text Codes
Cut Fill / Delta Elevation Between Point and Surface with C or F (Surface Elevation = ELS with (ELS,O,F,F,T,T) (Red T = C of F) with No Units Suffix	@<ELS,O,F,2,T,T>@ or ID: @<NM,O>@ Pt Elv: @<EL,O,F>@ Surf Elv:@<ELS,O,F>@ C/F: @<ELS,O,F,2,T,T>@
Labeling points with respect to a Surface, an Alignment to give Station, Offset, Elevation and Cut / Fill to the Surface	Sta: @<S,O,F,2>@ Off: @<O,O,F,2>@ Elv: @<EL,O,F,2>@ DElv: @<ELS,O,F,2,T,T>@
Labeling the horizontal segment and slope segment length of a line in Feet and Yards	HL = @<OD,O,SL,T,2>@ HL = @<OD,O,SL,T,2,YD>@  SL = @<OD,O,SL3,T,2>@ SL = @<OD,O,SL3,T,2,YD>@
Labeling the Horizontal and slope lengths of a line plus Unit Lengths of 8' and the cost of the line @\$145.30 / Unit Length	Type: @<NM,O>@ HL: @<L,O,T,2>@ SL:@<OD,O,3DL,T,2>@ Unit Lengths (8'):@<OD,O,3DL,F,1 /8>@ Cost: \$@<OD,O,3DL,F,2 /8*145.30>@
Label the Flow line and Top Back of Curb Line using the Flow Line as the source of Elevations and a delta elevation of +0.5' for the TBC elevations. Use the Leader Method	FL Elv: @<ELL,LD,F,2>@ TBC Elv: @<ELL,LD,F,2 +0.5'>@ Use Near Snap to snap to the selected line.
Label the Line that crosses the Cut Fill Map to determine the "Depth to Invert" or "Depth to Top of Pipe" at different locations along the pipe. You can also use this to explore Depth of cover along a line to any surface. This is a great use of the Math in Smart Text also if you are given the line at Invert and you need the Depth of Cover to Top of Pipe - you can use the Math to add	Depth to Invert = @<ELS,L,F,2,T>@   Credit: Alan Sharp