5.1.7 Decode UPC/EAN Supplementals : Parameter # 0x10

Supplementals are appended characters (2 or 5) according to specific code format conventions (e.g., UPC A+2, UPC E+2). To enable or disable EAN-13, scan the appropriate bar code below.:

- If Decode UPC/EAN with Supplemental characters is selected, the scanner does not decode UPC/EAN symbols without supplemental characters.

Decode UPC/EAN With Supplementals (0x01)

- If Ignore UPC/EAN with Supplemental characters is selected, and the SE-955 is presented with a UPC/EAN symbol with a supplemental, the scanner decodes the UPC/EAN and ignores the supplemental characters.

***Ignore UPC/EAN With Supplementals (0x00)**

- If Autodiscriminate UPC/EAN Supplementals is selected, scan Decode UPC/EAN Supplemental Redundancy on page 8-25, then select a value from the numeric bar codes beginning on page 8-71. A value of 5 or more is recommended.

Autodiscriminate UPC/EAN Supplementals (0x02)

- Select Enable 378/379 Supplemental Mode to enable the SE-955 to identify supplementals for EAN-13 bar codes starting with a '378' or '379' prefix only. All other UPC/EAN bar codes are decoded immediately and the supplemental characters ignored.

Enable 378/379 Supplemental Mode (0x04)

- Select Enable 978 Supplemental Mode to enable the SE-955 to identify supplementals for EAN-13 bar codes starting with a '978' prefix only. All other UPC/EAN bar codes are decoded immediately and the supplemental characters ignored.

Enable 978 Supplemental Mode (0x05)

- Select Enable Smart Supplemental Mode to enable the SE-955 to identify supplementals for EAN-13 bar codes starting with a '378', '379', or '978' prefix only. All other UPC/EAN bar codes are decoded immediately and the supplemental characters ignored.

Enable Smart Supplemental Mode (0x03)

Note

To minimize the risk of invalid data transmission, we recommend selecting whether to read or ignore supplemental characters.

5.1.8 Decode UPC/EAN Supplemental Redundancy : Parameter # 0x50

With Autodiscriminate UPC/EAN Supplementals selected, this option adjusts the number of times a symbol without supplementals will be decoded before transmission. The range is from 2 to 30 times. Five or above is recommended when decoding a mix of UPC/EAN symbols with and without supplementals, and the autodiscriminate option is selected.

Scan the bar code below to select a decode redundancy value. Next scan two numeric bar codes beginning on page 8-71. Single digit numbers must have a leading zero. To change the selection or cancel an incorrect entry, scan the Cancel bar code on page 8-72.

Decode UPC/EAN Supplemental Redundancy (Default: 7)

5.1.9 Transmit UPC-A Check Digit : Parameter # 0x28

Scan the appropriate bar code below to transmit the symbol with or without the UPC-A check digit.

***Transmit UPC-A Check Digit (0x01)**

Do Not Transmit UPC-A Check Digit (0x00)

5.1.10 Transmit UPC-E Check Digit : Parameter # 0x29

Scan the appropriate bar code below to transmit the symbol with or without the UPC-E check digit.

***Transmit UPC-E Check Digit (0x01)**

Do Not Transmit UPC-E Check Digit (0x00)

5.1.11 Transmit UPC-E1 Check Digit : Parameter # 0x2A

Scan the appropriate bar code below to transmit the symbol with or without the UPC-E1 check digit.

***Transmit UPC-A Check Digit (0x01)**

Do Not Transmit UPC-A Check Digit (0x00)

5.1.12 UPC-A Preamble : Parameter # 0x22

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-A symbol. Select one of the following options for transmitting UPC-A preamble to the host device: transmit system character only, transmit system character and country code ("0" for USA), or transmit no preamble.

No Preamble (<DATA>) (0x00)

***System Character (<SYSTEM CHARACTER> <DATA>) (0x01)**

System Character & Country Code (< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>) (0x02)

5.1.13 UPC-E Preamble : Parameter # 0x23

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-E symbol. Select one of the following options for transmitting UPC-E preamble to the host device: transmit system character only, transmit system character and country code ("0" for USA), or transmit no preamble.

No Preamble (<DATA>) (0x00)

***System Character (<SYSTEM CHARACTER> <DATA>) (0x01)**

System Character & Country Code (< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>) (0x02)

5.1.14 UPC-E1 Preamble : Parameter # 0x24

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-E1 symbol. Select one of the following options for transmitting UPC-E1 preamble to the host device: transmit system character only, transmit system character and country code ("0" for USA), or transmit no preamble.

No Preamble
(<DATA>)
(0x00)

***System Character**
(<SYSTEM CHARACTER> <DATA>)
(0x01)

System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)
(0x02)

5.1.15 Convert UPC-E to UPC-A : Parameter # 0x25

Enable this parameter to convert UPC-E (zero suppressed) decoded data to UPC-A format before transmission. After conversion, data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Scan **DO NOT CONVERT UPC-E TO UPC-A** to transmit UPC-E (zero suppressed) decoded data.

Convert UPC-E to UPC-A (Enable)
(0x01)

***Do Not Convert UPC-E to UPC-A (Disable)**
(0x00)

5.1.16 Convert UPC-E1 to UPC-A : Parameter # 0x26

Enable this parameter to convert UPC-E1 (zero suppressed) decoded data to UPC-A format before transmission. After conversion, data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Scan **DO NOT CONVERT UPC-E TO UPC-A** to transmit UPC-E1 (zero suppressed) decoded data.

Convert UPC-E1 to UPC-A (Enable)
(0x01)

***Do Not Convert UPC-E1 to UPC-A (Disable)**
(0x00)

5.1.17 EAN Zero Extend : Parameter # 0x27

When enabled, this parameter adds five leading zeros to decoded EAN-8 symbols to make them compatible in format to EAN-13 symbols.

Disable this parameter to transmit EAN-8 symbols as is.

Enable EAN Zero Extend
(0x01)

***Disable EAN Zero Extend**
(0x00)

5.1.18 Convert EAN-8 to EAN-13 Type : Parameter # 0xE0

When EAN Zero Extend is enabled, you can label the extended symbol as either an EAN-13 bar code, or an EAN-8 bar code. This affects **Transmit Code ID Character** and **DECODE_DATA** message.

When EAN Zero Extend is disabled, this parameter has no effect on bar code data.

***Type Is EAN-13**
(0x00)

Type Is EAN-8
(0x01)

5.1.19 UPC/EAN Security Level : Parameter # 0x4D

The SE-955 offers four levels of decode security for UPC/EAN bar codes. Increasing levels of security are provided for decreasing levels of bar code quality. Select higher levels of security for decreasing levels of bar code quality. Increasing security decreases the scanner's aggressiveness, so choose only that level of security necessary for the application.

UPC/EAN Security Level 0: This default setting allows the scanner to operate in its most aggressive state, while providing sufficient security in decoding most "in-spec" UPC/EAN bar codes.

***UPC/EAN Security Level 0**
(0x00)

UPC/EAN Security Level 1: As bar code quality levels diminish, certain characters become prone to mis-decodes before others (i.e., 1, 2, 7, 8). If mis-decodes of poorly printed bar codes occur, and the mis-decodes are limited to these characters, select this security level.

UPC/EAN Security Level 1
(0x01)

UPC/EAN Security Level 2: If mis-decodes of poorly printed bar codes occur, and the mis-decodes are not limited to characters 1, 2, 7, and 8, select this security level.

UPC/EAN Security Level 2
(0x02)

UPC/EAN Security Level 3: If misdecodes still occur after selecting Security Level 2, select this security level. Be advised, selecting this option is an extreme measure against mis-decoding severely out of spec bar codes. Selection of this level of security significantly impairs the decoding ability of the scanner. If this level of security is necessary, try to improve the quality of the bar codes.

UPC/EAN Security Level 3
(0x03)

5.1.20 UCC Coupon Extended Code : Parameter # 0x55

The UCC Coupon Extended Code is an additional bar code adjacent to a UCC Coupon Code. To enable or disable UCC Coupon Extended Code, scan the appropriate bar code below.

Enable UCC Coupon Extended Code
(0x01)

***Disable UCC Coupon Extended Code**
(0x00)

5.2 Code 128

5.2.1 Enable/Disable Code 128 : Parameter # 0x08

To enable or disable Code 128, scan the appropriate bar code below.

***Enable Code 128**
(0x01)

Disable Code 128
(0x00)

5.2.2 Enable/Disable UCC/EAN-128 : Parameter # 0x0E

To enable or disable UCC/EAN-128, scan the appropriate bar code below. (See **Chapter B, Miscellaneous Code Information** for details on UCC/EAN-128.)

***Enable UCC/EAN-128**
(0x01)

Disable UCC/EAN-128
(0x00)

5.2.3 Enable/Disable ISBT 128 : Parameter # 0x54

To enable or disable ISBT 128, scan the appropriate bar code below.

***Enable ISBT 128 (0x01)**

Disable ISBT 128 (0x00)

5.2.4 Lengths for Code 128

No length setting is required for Code 128.

5.3 Code 39

5.3.1 Enable/Disable Code 39 : Parameter # 0x00

To enable or disable Code 39, scan the appropriate bar code below.

***Enable Code 39 (0x01)**

Disable Code 39 (0x00)

5.3.2 Enable/Disable Trioptic Code 39 : Parameter # 0x0D

Trioptic Code 39 is a variant of Code 39 used in marking computer tape cartridges. Trioptic Code 39 symbols always contain six characters.

To enable or disable Trioptic Code 39, scan the appropriate bar code below.

Enable Trioptic Code 39 (0x01)

***Disable Trioptic Code 39 (0x00)**

Note

Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously. If an error beep sounds when enabling Trioptic Code 39, disable Code 39 Full ASCII and try again.

5.3.3 Convert Code 39 to Code 32 (Italian Pharma Code) : Parameter # 0x56

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Scan the appropriate bar code below to enable or disable converting Code 39 to Code 32.

Note

Code 39 must be enabled in order for this parameter to function.

Enable Convert Code 39 to Code 32 (0x01)

***Disable Convert Code 39 to Code 32 (0x00)**

5.3.4 Code 32 Prefix : Parameter # 0xE7

Enable this parameter to add the prefix character "A" to all Code 32 bar codes. **Convert Code 39 to Code 32 (Italian Pharma Code)** must be enabled for this parameter to function.

Enable Code 32 Prefix (0x01)

***Disable Code 32 Prefix (0x00)**

5.3.5 Set Lengths for Code 39 : Parameter # L1 = 0x12, L2 = 0x13

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for Code 39 may be set for any length, one or two discrete lengths, or lengths within a specific range. If Code 39 Full ASCII is enabled, **Length Within a Range** or **Any Length** are the preferred options.

Note

When setting lengths, single digit numbers must always be preceded by a leading zero.

- **One Discrete Length** - This option limits decodes to only those Code 39 symbols containing a selected length. Lengths are selected from the numeric bar codes in **Section 5.5** on page **95**. For example, to decode only Code 39 symbols with 14 characters, scan **Code 39** - **One Discrete Length**, then scan **1** followed by **4**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

Code 39 - One Discrete Length

- **Two Discrete Lengths** - This option limits decodes to only those Code 39 symbols containing either of two selected lengths. Lengths are selected from the numeric bar codes in **Section 5.5** on page **95**. For example, to decode only those Code 39 symbols containing either 2 or 14 characters, scan **Code 39** - **Two Discrete Lengths**, then scan **0, 2, 1** and then **4**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

Code 39 - Two Discrete Lengths

- **Length Within Range** - This option limits decodes to only those Code 39 symbols within a specified range. For example, to decode Code 39 symbols containing between 4 and 12 characters, first scan **Code 39** - **Length Within Range**. Then scan **0, 4, 1** and **2**. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan Cancel in **Section 5.5.1** on page **95**.

Code 39 - Length Within Range

- **Any Length** - Scan this option to decode Code 39 symbols containing any number of characters.

Code 39 - Any Length

5.3.6 Code 39 Check Digit Verification : Parameter # 0x30

When this feature is enabled, the scanner checks the integrity of all Code 39 symbols to verify that the data complies with specified check digit algorithm. Only those Code 39 symbols which include a modulo 43 check digit are decoded. Only enable this feature if your Code 39 symbols contain a module 43 check digit.

Verify Code 39 Check Digit (0x01)

***Do Not Verify Code 39 Check Digit (0x00)**

5.3.7 Transmit Code 39 Check Digit : Parameter # 0x2B

Scan this symbol to transmit the check digit with the data.

Verify Code 39 Check Digit (0x01)

Scan this symbol to transmit data without the check digit.

***Do Not Verify Code 39 Check Digit (0x00)**

5.3.8 Enable/Disable Code 39 Full ASCII : Parameter # 0x11

Code 39 Full ASCII is a variant of Code 39 which pairs characters to encode the full ASCII character set. To enable or disable Code 39 Full ASCII, scan the appropriate bar code below.

Refer to Table B-3 on page B-5 for the mapping of Code 39 characters to ASCII values.

Verify Code 39 Check Digit (0x01)

***Do Not Verify Code 39 Check Digit (0x00)**

Note

Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously. If you get an error beep when enabling Code 39 Full ASCII, disable Trioptic Code 39 and try again.

5.4 Code 93

5.4.1 Enable/Disable Code 93 : Parameter # 0x00

To enable or disable Code 93, scan the appropriate bar code below.

Enable Code 93
(0x01)

***Disable Code 93**
(0x00)

5.4.2 Set Lengths for Code 93 : Parameter # L1 = 0x1A, L2 = 0x1B

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for Code 93 may be set for any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only those codes containing a selected length. For example, select **Code 93** - **One Discrete Length**, then scan **1, 4** to limit the decoding to only Code 93 symbols containing 14 characters. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

Code 93 - One Discrete Length

- **Two Discrete Lengths** - Select this option to decode only those codes containing two selected lengths. For example, select **Code 39** - **Two Discrete Lengths**, then scan **0, 2, 1**, **4** to limit the decoding to only Code 93 symbols containing 2 or 14 characters. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

Code 93 - Two Discrete Lengths

- **Length Within Range** - This option sets the unit to decode a code type within a specified range. For example, to decode Code 93 symbols containing between 4 and 12 characters, first scan **Code 39** - **Length Within Range**. Then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan Cancel in **Section 5.5.1** on page **95**.

Code 93 - Length Within Range

- **Any Length** - Scan this option to decode Code 93 symbols containing any number of characters.

Code 93 - Any Length

5.5 Code 11

5.5.1 Enable/Disable Code 11 : Parameter # 0x0A

To enable or disable Code 11, scan the appropriate bar code below.

Enable Code 11
(0x01)

***Disable Code 11**
(0x00)

5.5.2 Set Lengths for Code 11 : Parameter # L1 = 0x1C, L2 = 0x1D

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 11 to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only Code 11 symbols containing a selected length. Select the length using the numeric bar codes in Numeric Bar Codes in **Section 5.5** on page **95**. For example, to decode only Code 11 symbols with 14 characters, scan **Code 11** - **One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan **Cancel** in **Section 5.5.1** on page **95**.

Code 11 - One Discrete Length

- **Two Discrete Lengths** - Select this option to decode only Code 11 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in Numeric Bar Codes on page 8-76. For example, to decode only those Code 11 symbols containing either 2 or 14 characters, select **Code 11** - **Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan **Cancel** in **Section 5.5.1** on page **95**.

Code 11 - Two Discrete Lengths

Length Within Range - Select this option to decode a Code 11 symbol with a specific length range. Select lengths using numeric bar codes in Numeric Bar Codes on page 8-76. For example, to decode Code 11 symbols containing between 4 and 12 characters, first scan **Code 11 - Length Within Range**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** in **Section 5.5.1** on page **95**.

Code 11 - Length Within Range

Any Length - Scan this option to decode Code 11 symbols containing any number of characters within the scanner capability.

Code 11 - Any Length

5.5.3 Code 11 Check Digit Verification : Parameter # 0x34

This feature allows the scanner to check the integrity of all Code 11 symbols to verify that the data complies with the specified check digit algorithm. This selects the check digit mechanism for the decoded Code 11 bar code. The options are to check for one check digit, check for two check digits, or disable the feature.

To enable this feature, scan the bar code below corresponding to the number of check digits encoded in your Code 11 symbols.

***Disable (0x00)**

One Check Digit (0x01)

Two Check Digits (0x02)

5.5.4 Transmit Code 11 Check Digits : Parameter # 0x2F

This feature selects whether or not to transmit the Code 11 check digit(s).

Transmit Code 11 Check Digit(s) (Enable) (0x01)

***Do Not Transmit Code 11 Check Digit(s) (Disable) (0x00)**

Note: Code 11 Check Digit Verification must be enabled for this parameter to function.

5.6 Interleaved 2 of 5

5.6.1 Enable/Disable Interleaved 2 of 5 : Parameter # 0x06

To enable or disable Interleaved 2 of 5, scan the appropriate bar code below.

***Enable Interleaved 2 of 5 (0x01)**

Disable Interleaved 2 of 5 (0x00)

5.6.2 Set Lengths for Interleaved 2 of 5 : Parameter # L1 = 0x16, L2 = 0x17

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for I 2 of 5 may be set for any length, one or two discrete lengths, or lengths within a specific range.

Note: When setting lengths, single digit numbers must always be preceded by a leading zero.

- **One Discrete Length** - Select this option to decode only those codes containing a selected length. For example, select **I 2 of 5** - **One Discrete Length**, then scan **1**, **4**, to decode only I 2 of 5 symbols containing 14 characters. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry,scan **Cancel** in **Section 5.5.1** on page **95**.

I 2 of 5 - One Discrete Length

- **Two Discrete Lengths** - Select this option to decode only those codes containing two selected lengths. For example, select **I 2 of 5** - **Two Discrete Lengths**, then scan **0, 6, 1, 4** to decode only I 2 of 5 symbols containing 6 or 14 characters. Numeric bar codes begin on page 8-71. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

I 2 of 5 - Two Discrete Lengths

- **Length Within Range** - Select this option to decode only codes within a specified range. For example, to decode I 2 of 5 symbols containing between 4 and 12 characters, first scan **I 2 of 5** - **Length Within Range**. Then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

I 2 of 5 - Length Within Range

- **Any Length** - Scan this option to decode Code 39 symbols containing any number of characters.

Note

Selecting this option may lead to misdecodes for I 2 of 5 codes.

I 2 of 5 - Any Length

5.6.3 Interleaved 2 of 5 Check Digit Verification : Parameter # 0x31

When enabled, this parameter checks the integrity of an I 2 of 5 symbol to ensure it complies with a specified algorithm, either USS (Uniform Symbology Specification), or OPCC (Optical Product Code Council).

***Disable (0x00)**

USS Check Digit (0x01)

OPCC Check Digit (0x02)

5.6.4 Transmit Interleaved 2 of 5 Check Digit: Parameter # 0x2C

Scan this symbol to transmit the check digit with the data.

Transmit I 2 of 5 Check Digit (Enable) (0x01)

Scan this symbol to transmit data without the check digit.

***Do Not Transmit I 2 of 5 Check Digit (Disable) (0x00)**

5.6.5 Convert Interleaved 2 of 5 to EAN-13 : Parameter # 0x52

This parameter converts a 14 character I 2 of 5 code into EAN-13, and transmits to the host as EAN-13. To accomplish this, I 2 of 5 must be enabled, one length must be set to 14, and the code must have a leading zero and a valid EAN-13 check digit.

Convert I 2 of 5 to EAN-13 (Enable) (0x01)

***Do Not Convert I 2 of 5 to EAN-13 (Disable) (0x00)**

5.7 Discrete 2 of 5

5.7.1 Enable/Disable Discrete 2 of 5 : Parameter # 0x05

To enable or disable Discrete 2 of 5, scan the appropriate bar code below.

Enable Discrete 2 of 5 (0x01)

***Disable Discrete 2 of 5 (0x00)**

5.7.2 Set Lengths for Discrete 2 of 5 : Parameter # L1 = 0x14, L2 = 0x15

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for D 2 of 5 may be set for any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only those codes containing a selected length. For example, select **D 2 of 5** - **One Discrete Length**, then scan **1**, **4**, to decode only D 2 of 5 symbols containing 14 characters. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry,scan **Cancel** in **Section 5.5.1** on page **95**.

D 2 of 5 - One Discrete Length

- **Two Discrete Lengths** - Select this option to decode only those codes containing two selected lengths. For example, select **D 2 of 5** - **Two Discrete Lengths**, then scan **0, 4, 1, 2** (single digit numbers must be preceded by a leading zero). Numeric bar codes begin on page 8-71. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

D 2 of 5 - Two Discrete Lengths

- **Length Within Range** - Select this option to decode only codes within a specified range. For example, to decode D 2 of 5 symbols containing between 4 and 12 characters, first scan **D 2 of 5** - **Length Within Range**. Then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

D 2 of 5 - Length Within Range

- **Any Length** - Scan this option to decode D 2 of 5 symbols containing any number of characters.

Note

Selecting this option may lead to misdecodes for D 2 of 5 codes.

D 2 of 5 - Any Length

5.8 Chinese 2 of 5

5.8.1 Enable/Disable Chinese 2 of 5 : Parameter # 0xF0 0x98

To enable or disable Chinese 2 of 5, scan the appropriate bar code below.

Enable Chinese 2 of 5 (0x01)

***Disable Chinese 2 of 5 (0x00)**

5.9 Codabar

5.9.1 Enable/Disable Codabar : Parameter # 0x07

To enable or disable Codabar, scan the appropriate bar code below.

Enable Codabar (0x01)

***Disable Codabar (0x00)**

5.9.2 Set Lengths for Codabar : Parameter # L1 = 0x18, L2 = 0x19

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Lengths for Codabar may be set for any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only those codes containing a selected length. For example, select **Codabar** - **One Discrete Length**, then scan **1**, **4**, to decode only Codabar symbols containing 14 characters. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

Codabar - One Discrete Length

- **Two Discrete Lengths** - Select this option to decode only those codes containing two selected lengths. For example, select **Codabar** - **Two Discrete Lengths**, then scan **0, 2, 1, 4** to decode only Codabar symbols containing 6 or 14 characters. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

Codabar - Two Discrete Lengths

- **Length Within Range** - Select this option to decode only codes within a specified range. For example, to decode D 2 of 5 symbols containing between 4 and 12 characters, first scan **D 2 of 5** - **Length Within Range**. Then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

Codabar - Length Within Range

- **Any Length** - Scan this option to decode D 2 of 5 symbols containing any number of characters.

Note

Selecting this option may lead to misdecodes for D 2 of 5 codes.

Codabar - Any Length

5.9.3 CLSI Editing : Parameter # 0x36

When enabled, this parameter strips the start and stop characters and inserts a space after the first, fifth, and tenth characters of a 14-character Codabar symbol.

Note

Symbol length does not include start and stop characters.

Enable CLSI Editing (0x01)

***Disable CLSI Editing (0x00)**

5.9.4 NOTIS Editing : Parameter # 0x37

When enabled, this parameter strips the start and stop characters from decoded Codabar symbol.

Enable NOTIS Editing (0x01)

***Disable NOTIS Editing (0x00)**

5.10 MSI

5.10.1 Enable/Disable MSI : Parameter # 0x0B

To enable or disable MSI, scan the appropriate bar code below.

Enable MSI (0x01)

***Disable MSI (0x00)**

5.10.2 Set Lengths for MSI : Parameter # L1 = 0x1E, L2 = 0x1F

The length of a code refers to the number of characters (i.e., human readable characters) the code contains, and includes check digits. Lengths for MSI can be set for any length, one or two discrete lengths, or lengths within a specific range. See Table B-5 on page B-9 for ASCII equivalents.

- **One Discrete Length** - Select this option to decode only those codes containing a selected length. For example, select **MSI Plessey** - **One Discrete Length**, then scan **1, 4** to limit the decoding to only MSI Plessey symbols containing 14 characters. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

MSI - One Discrete Length

- **Two Discrete Lengths** - Select this option to decode only those codes containing two selected lengths. For example, select **MSI Plessey** - **Two Discrete Lengths**, then scan **0, 6, 1**, **4** to decode only MSI Plessey symbols containing 6 or 14 characters. Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

MSI - Two Discrete Lengths

- **Length Within Range** - Select this option to decode codes within a specified range. For example, to decode MSI symbols containing between 4 and 12 characters, first scan **MSI Plessey** - **Length Within Range**. Then scan **0, 4, 1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

MSI - Length Within Range

- **Any Length** - Scan this option to decode MSI Plessey symbols containing any number of characters.

Note

Selecting this option may lead to misdecodes for MSI codes.

MSI - Any Length

5.10.3 MSI Check Digits : Parameter # 0x32

These check digits at the end of the bar code verify the integrity of the data. At least one check digit is always required. Check digits are not automatically transmitted with the data.

***One MSI Check Digit (0x00)**

If two check digits is selected, also select an MSI Check Digit Algorithm. See page 8-56.

Two MSI Check Digit (0x01)

5.10.4 Transmit MSI Check Digit : Parameter # 0x2E

Scan this symbol to transmit the check digit with the data.

Transmit MSI Check Digit (Enable) (0x01)

Scan this symbol to transmit data without the check digit.

***Do Not Transmit MSI Check Digit (Disable) (0x00)**

5.10.5 MSI Check Digit Algorithm : Parameter # 0x33

When the Two MSI check digits option is selected, an additional verification is required to ensure integrity. Select one of the following algorithms.

MOD 10/ MOD 11 (0x00)

***MOD 10/ MOD 10 (0x01)**

5.11 RSS

5.11.1 Enable/Disable RSS-14 : Parameter # 0xF0 0x52

To enable or disable RSS-14, scan the appropriate bar code below.

Enable RSS-14
(0x01)

***Disable RSS-14**
(0x00)

5.11.2 Enable/Disable RSS-Limited : Parameter # 0xF0 0x53

To enable or disable RSS-Limited, scan the appropriate bar code below.

Enable RSS-Limited
(0x01)

***Disable RSS-Limited**
(0x00)

5.11.3 Enable/Disable RSS-Expanded : Parameter # 0xF0 0x54

To enable or disable RSS-Expanded, scan the appropriate bar code below.

Enable RSS-Expanded
(0x01)

***Disable RSS-Expanded**
(0x00)

5.12 Data Options

5.12.1 Transmit Code ID Character : Parameter # 0x2D

A code ID character identifies the code type of a scanned bar code. This can be useful when decoding more than one code type. The code ID character is inserted between the prefix character (if selected) and the decoded symbol.

Select no code ID character, a Symbol Code ID character, or an AIM Code ID character. The Symbol Code ID characters are listed below; see B for **AIM Code Identifiers**.

- A = UPC-A, UPC-E, UPC-E1, EAN-8, EAN-13
- B = Code 39, Code 32
- C = Codabar
- D = Code 128, ISBT 128
- E = Code 93
- F = Interleaved 2 of 5
- G = Discrete 2 of 5
- J = MSI
- K = UCC/EAN-128
- L = Bookland EAN
- M = Trioptic Code 39
- N = Coupon Code
- R = RSS-14, RSS-Limited, RSS-Expanded

Symbol Code ID Character
(0x02)

Aim Code ID Character
(0x01)

***None**
(0x00)

5.12.2 Prefix/Suffix Values : Parameter # P = 0x69, S1 = 0x68, S2 = 0x6A

A prefix and/or one or two suffixes can be appended to scan data for use in data editing. To set these values, scan a four-digit number (i.e. four bar codes) that corresponds to ASCII values. **Numeric Bar Codes** are in **Section 5.5** on page **95**. To change the selection or cancel an incorrect entry, scan **Cancel** in **Section 5.5.1** on page **95**.

Scan Prefix

Scan Suffix 1

Scan Suffix 2

Data Format Cancel

5.12.3 Scan Data Transmission Format : Parameter # 0xEB

To change the Scan Data Transmission Format, scan one of the eight bar codes corresponding to the desired format.

***Data As Is (0x00)**

<DATA> <SUFFIX 1> (0x01)

<DATA> <SUFFIX 2> (0x02)

<DATA> <SUFFIX 1> <SUFFIX 2> (0x03)

<PREFIX> <DATA > (0x04)

<PREFIX> <DATA> <SUFFIX 1> (0x05)

<PREFIX> <DATA> <SUFFIX 2> (0x06)

<PREFIX> <DATA> <SUFFIX 1> <SUFFIX 2> (0x07)

5.13 Serial Interface

5.13.1 Baud Rate : Parameter # 0x9C

Baud rate is the number of bits of data transmitted per second. The scanner's baud rate setting should match the data rate setting of the host device. If not, data may not reach the host device or may reach it in distorted form.

Baud Rate 300
(0x01)

Baud Rate 600
(0x02)

Baud Rate 1200
(0x03)

Baud Rate 2400
(0x04)

Baud Rate 4800
(0x05)

***Baud Rate 9600**
(0x06)

Baud Rate 19,200
(0x07)

Baud Rate 38,400
(0x08)

5.13.2 Parity : Parameter # 0x9E

A parity check bit is the most significant bit of each ASCII coded character. Select the parity type according to host device requirements.

If you select **ODD** parity, the parity bit has a value 0 or 1, based on data, to ensure than an odd number of 1 bits is contained in the coded character.

Odd
(0x00)

If you select **EVEN** parity, the parity bit has a value 0 or 1, based on data, to ensure than an even number of 1 bits is contained in the coded character.

Even
(0x01)

Select **MARK** parity and the parity bit is always 1.

Mark
(0x02)

Select **SPACE** parity and the parity bit is always 0.

Space
(0x03)

If no parity is required, select **NONE**.

***None**
(0x04)

5.13.3 Software Handshaking : Parameter # 0x9F

This parameter offers control of the data transmission process in addition to that offered by hardware handshaking. Hardware handshaking is always enabled and cannot be disabled by the user.

Disable ACK/NAK Handshaking

When this option is selected, the decoder will neither generate nor expect ACK/NAK handshaking packets.

Disable ACK/NAK
(0x00)

Enable ACK/NAK Handshaking

When this option is selected, after transmitting data, the scanner expects either an ACK or NAK response from the host. The scanner also ACKs or NAKs messages from the host.

The scanner waits up to the programmable Host Serial Response Time-out to receive an ACK or NAK. If the scanner does not get a response in this time, it resends its data up to two times before discarding the data and declaring a transmit error.

***Enable ACK/NAK**
(0x01)

5.13.4 Decode Data Packet Format : Parameter # 0xEE

This parameter selects whether decoded data is transmitted in raw format (unpacketed), or transmitted with the packet format as defined by the serial protocol. If the raw format is selected, ACK/NAK handshaking is disabled for decode data.

***Send Raw Decode Data**
(0x00)

Send Packeted Decode Data
(0x01)

5.13.5 Host Serial Response Time-out : Parameter # 0x9B

This parameter specifies how long the decoder waits for an ACK or NAK before resending. Also, if the decoder wants to send, and the host has already been granted permission to send, the decoder waits for the designated time-out before declaring an error.

The delay period can range from 0.0 to 9.9 seconds in 0.1 second increments. After scanning the bar code below, scan two numeric bar codes in **Section 5.5** on page **95**. Values less than 10 require a leading zero. To change the selection or cancel an incorrect entry, scan the **Cancel** bar code in **Section 5.5.1** on page **95**.

Host Serial Response Time-out
(Default: 2.0 sec.)

5.13.6 Stop Bit Select : Parameter # 0x9D

The stop bit(s) at the end of each transmitted character marks the end of transmission of one character and prepares the receiving device for the next character in the serial data stream. Set the number of stop bits (one or two) to match host device requirements.

***1 Stop Bit**
(0x01)

2 Stop Bits
(0x02)

5.13.7 Intercharacter Delay : Parameter # 0x6E

The intercharacter delay gives the host system time to service its receiver and perform other tasks between characters. Select the intercharacter delay option matching host requirements. The delay period can range from no delay to 99 msec in 1 msec increments. After scanning the bar code below, scan two bar codes beginning in **Section 5.5** on page **95** to set the desired time-out. To change the selection or cancel an incorrect entry, scan the **Cancel** bar code in **Section 5.5.1** on page **95**.

Intercharacter Delay
(Default: 0 sec.)

5.13.8 Host Character Time-out : Parameter # 0xEF

This parameter determines the maximum time the decoder waits between characters transmitted by the host before discarding the received data and declaring an error. The time-out is set in 0.01 second increments from 0.01 seconds to 0.99 seconds. After scanning the bar code below, scan two bar codes beginning in **Section 5.5** on page **95** to set the desired time-out. To change the selection or cancel an incorrect entry, scan the **Cancel** bar code in **Section 5.5** on page **95**.

Host Character Time-out
(Default: 200 msec.)

5.14 Event Reporting

The host can request the decoder to furnish certain information (events) relative to the decoder's behavior. Enable or disable the events listed in Table 8-2 by scanning the appropriate bar codes on the following pages. Parameter number format for these parameters follows those shown in Table 9-9 on page 9-20 for parameters numbered 256 or higher.

Event Class	Event	Code Reported
Decode Event	Non parameter decode	0x01
Boot Up Event	System power-up	0x03
Parameter Event	Parameter entry error	0x07
	Parameter stored	0x08
	Defaults set (and parameter event is enabled by default)	0x0A
	Number expected	0x0F

5.14.1 Decode Event : Parameter # 0xF0 0x00

When enabled, the decoder generates a message to the host whenever a bar code is successfully decoded. When disabled, no notification is sent.

Enable (0x01)

***Disable (0x00)**

5.14.2 Boot Up Event : Parameter # 0xF0 0x02

When enabled, the decoder sends a message to the host whenever power is applied. When disabled, no message is sent.

Enable (0x01)

***Disable (0x00)**

5.14.3 Parameter Event : Parameter # 0xF0 0x03

When enabled, the decoder sends a message to the host when one of the events specified in the table in **Section 5.14** above occurs. When disabled, no message is sent.

Enable (0x01)

***Disable (0x00)**

5.15 Numeric Bar Codes

For parameters requiring specific numeric values, scan the appropriately numbered bar code(s).

0

1

2

3

4

5

6

7

8

9

5.15.1 Cancel

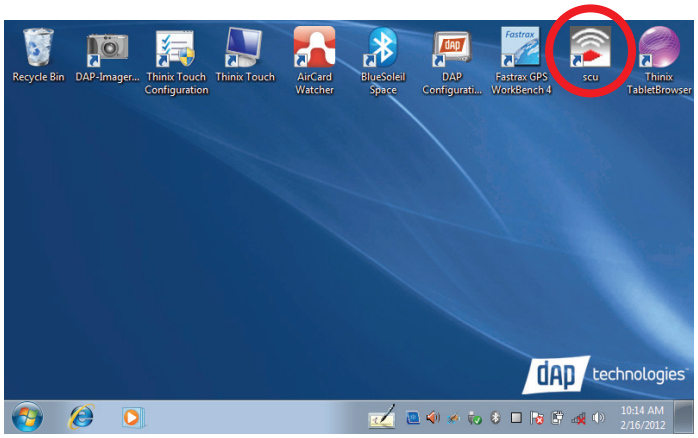
To change the selection or cancel an incorrect entry, scan the bar code below.

Cancel

6.0 Summit Radio

6.1 Summit Client Utility

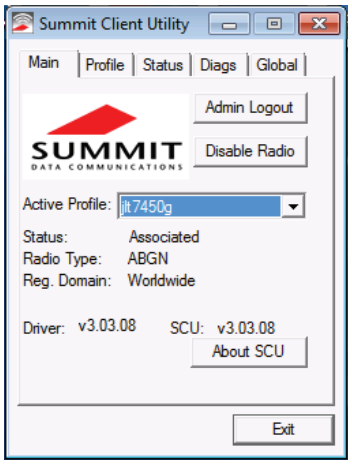
To launch, double-tap the **scu** icon at the top of the screen:



6.1.1 Main Window

The Main window provides an overview of the current wireless network connection configuration (Active Profile), a snapshot of connection information as well as access to administrator functions (Admin Login/ Logout - administrator use only), and additional information regarding SCU (About SCU).

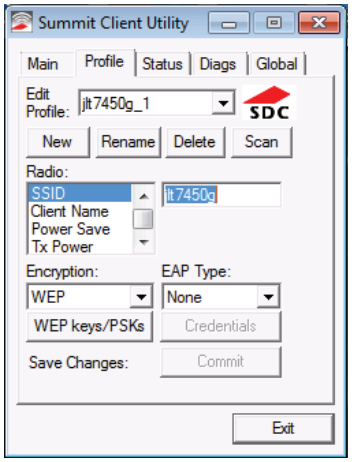
The Main window displays the following properties and options:



Element	Description
Admin Login/ Logout	Administrator use only.
Enable Radio/ Disable Radio	When the radio is enabled, select this button (which displays Disable Radio) to disable it. When the radio is disabled, select the same button (which now displays Enable Radio) to enable it. **Note:** When the radio is enabled, it attempts to make and/ or maintains a connection to an access point. When a radio is disabled, its power remains on but it does not attempt to make a connection to an access point.
Active Profile	Displays the name of the active. Use the drop-down menu to select a different profile. **Note**: If ThirdPartyConfig is selected (and after the device goes through a power cycle), WZC (Windows Zero Configuration) or another application is used to configure the SSID, Auth Type, EAP Type, and Encryption settings. See "ThirdPartyConfig" for more information.
Status	Indicates the current status of the Summit radio. Connection status options include:
	Down: The radio is not recognized by Summit software and thus is not associated nor authenticated.
	Disabled: The radio is disabled. To enable the radio, tap Enable Radio located on the SCU Main window. When the radio is disabled, it does not attempt to make a connection to an access point.
Status (cont'd)	Not Associated: The radio has not established a connection to an access point.
	Associated: The radio has established a connection to an access point but is not EAP authenticated. The radio can not communicate unless it is associated and EAP authenticated. **Note**: If the Encryption type is set to WEP or Open (None), it can communicate (send data) while in the Associated state.
	<EAP type> Authenticated: The radio has established a connection to an access point and has completed EAP authentication successfully. In this state, the radio can communicate (send data).
Radio Type	Indicates the type of radio installed in the device. For example:
	BG: Indicates a Summit 802.11g radio which supports 802.11b and 802.11g.
	ABG: Indicates a Summit 802.11a/g radio which supports 802.11a , 802.11b, and 802.11g.
	N: Indicates Summit 802.11n radio which supports 802.11a, 802.11b, 802.11g, and 802.11n.
Reg. Domain	Indicates the regulatory domain(s) for which the radio is configured, including FCC, ETSI, TELEC, and KCC.
Auto Profile	Auto profile enables you to activate or deactivate automatic profile selection. Tap List and use the dialog box to select a created profile. **Note**: There is a limit of 19 profiles in the Auto Profile list. **Note**: Auto Profile is only available on Windows CE and Windows Mobile operating systems.
Driver	Indicates the current version of the device driver.
SCU	Indicates the SCU version currently running on the device. Displays only if space permits.
Import/ Export	Displays only if the radio is programmed to allow import/export functions if you are logged in as an administrator. Tap Import/Export and use the dialog box to do one of the following: • Export global settings, all standard SCU profiles, and the special ThirdPartyConfig profile from the SCU area of a device's registry to a file that can be transferred to another device. • Import global settings, all standard SCU profiles, and the special ThirdPartyConfig profile from a file (created using the Export facility) to the SCU area of a device's registry to enable SCU to use the information. **Note:** When importing information, select Add to existing to merge new information with current registry information. Select Replace to overwrite the current registry information with the newly-imported information.
About SCU	Tap About SCU to view SCU information including driver and the SCU version.

6.1.2 Profile Window

Profile settings are radio and security settings that are stored in the registry as part of a configuration profile. When a profile is selected as the active profile on the Main window, the settings for that profile become active.



Notes: When the ThirdPartyConfig profile is selected, a power cycle must be performed. See "ThirdPartyConfig" for more information.

If the Default profile is not modified, it does not specify an SSID, an EAP type, or a data encryption method. As a result, if the Default is the active profile, then the radio associates only to an AP that broadcasts its SSID and requires no EAP type and no encryption.

From the Profile window, an administrator can:

- Define up to 20 profiles, in addition to the special ThirdPartyConfig profile.
- Change profile settings.
- Delete any profile except the special ThirdPartyConfig and the active profile.

Profile changes are not saved to the profile until you tap **Commit**.

Element	Description	
Edit Profile	Use the drop-down menu to select the profile to be viewed or edited. Only an administrator can edit a profile.	
Actions	Actions included New, Rename, Delete, and Scan. New, Rename, and Delete are only available to an administrator.	
	New	Create a new profile with default settings. Assign a unique name (a string of up to 32 characters). Edit profile settings using other Profile window selections.
	Rename	Change the profile name to one that is not assigned to another profile.
	Delete	Delete a non-active profile. You cannot delete an active profile.
	Scan	Tap to view a list of APs that are broadcasting SSIDs; select an SSID and create a profile for it. See "Using Scan to Create a Profile" for more information.
Radio	Select a radio attribute from the list on the left to view its value or setting in the box on the right. Only an administrator can edit these values or settings. See "Radio Settings" for more information.	
Security	Values for the two primary security attributes, EAP type and encryption type, are displayed in separate drop-down lists with the current values highlighted. Only an administrator can edit these security settings. See "Security Settings" for more information. • Encryption - When the administrator selects an encryption type that requires the definition of WEP keys or a pre-shared key (PSK), the WEP keys/PSKs button becomes active. Tap WEP keys/PSKs to define WEP keys or a PSK. • EAP Type - When the administrator selects an EAP type, the Credentials button becomes active. Tap Credentials to define authentication credentials for the selected EAP type.	
Save Changes	To save changes for the selected profile, you must tap Commit. If you make changes without tapping Commit and attempt to move to a different SCU window, a warning message displays and provides the option of saving your changes before you leave the Profile window.	

6.1.2.1 Radio Settings

Element	Description	
SSID	Use the drop-down menu to select the profile to be viewed or edited. Only an administrator can edit a profile.	
Client Name	Actions included New, Rename, Delete, and Scan. New, Rename, and Delete are only available to an administrator.	
	New	Create a new profile with default settings. Assign a unique name (a string of up to 32 characters). Edit profile settings using other Profile window selections.
	Rename	Change the profile name to one that is not assigned to another profile.
	Delete	Delete a non-active profile. You cannot delete an active profile.
	Scan	Tap to view a list of APs that are broadcasting SSIDs; select an SSID and create a profile for it. See "Using Scan to Create a Profile" for more information.
Power Save	Select a radio attribute from the list on the left to view its value or setting in the box on the right. Only an administrator can edit these values or settings. See "Radio Settings" for more information.	
Tx Power	Values for the two primary security attributes, EAP type and encryption type, are displayed in separate drop-down lists with the current values highlighted. Only an administrator can edit these security settings. See "Security Settings" for more information. • Encryption - When the administrator selects an encryption type that requires the definition of WEP keys or a pre-shared key (PSK), the WEP keys/PSKs button becomes active. Tap WEP keys/PSKs to define WEP keys or a PSK. • EAP Type - When the administrator selects an EAP type, the Credentials button becomes active. Tap Credentials to define authentication credentials for the selected EAP type.	
Bit Rate	To save changes for the selected profile, you must tap Commit. If you make changes without tapping Commit and attempt to move to a different SCU window, a warning message displays and provides the option of saving your changes before you leave the Profile window.	
Radio Mode	Use of 802.11a, 802.11g, 802.11b, and 802.11n frequencies and data rates when interacting with AP, or use of ad hoc mode to associate to a client radio instead of an AP. When SCU operates with a Summit 802.11g radio, an administrator can select from among the following Radio Mode values: • Value: – B rates only - 1, 2, 5.5, and 11 Mbps – G rates only - 6, 9, 12, 18, 24, 36, 48, and 54 Mbps – BG rates full - All B and G rates – BG Subset - 1, 2, 5.5, 6, 11, 24, 36, and 54 Mbps. This should only be used with Cisco APs running IOS in autonomous mode (without controllers). For Cisco APs that are tied to controllers and for non-Cisco APs, Summit recommends BG rates full. – Ad Hoc - When selected, the Summit radio uses ad hoc mode instead of infrastructure mode. In infrastructure mode, the radio associates to an AP. In ad hoc mode, the radio associates to another client radio that is in ad hoc mode and has the same SSID and, if configured, static WEP key. • Default - BG rates full	
Radio Mode (cont'd)	When SCU operates with a Summit 802.11a/g radio, an administrator can select from among the following Radio Mode values: • Value: – B rates only - 1, 2, 5.5, and 11 Mbps – G rates only - 6, 9, 12, 18, 24, 36, 48, and 54 Mbps – BG rates full - All B and G rates – A rates only - 6, 9, 12, 18, 24, 36, 48, and 54 Mbps (same as G rates) – ABG rates full - All A rates and all B and G rates, with A rates (the .11a radio) preferred. See "Preferred Band for 802.11a/g Radio" for more information. – BGA rates full - All B and G rates and all A rates, with B and G rates (the .11g radio) preferred. See "Preferred Band for 802.11a/g Radio" for more information. – BG Subset - 1, 2, 5.5, 6, 11, 24, 36, and 54 Mbps. This should only be used with Cisco APs running IOS in autonomous mode (without controllers). For Cisco APs that are tied to controllers and for non-Cisco APs, Summit recommends BG rates full. – Ad Hoc - When selected, the Summit radio uses ad hoc mode instead of infrastructure mode. In infrastructure mode, the radio associates to an AP. In ad hoc mode, the radio associates to another client radio that is in ad hoc mode and has the same SSID and, if configured, static WEP key. • Default - ABG rates full	
Auth Type	802.11 authentication type, used when associating to AP. • Value - Open, shared-key, or LEAP (Network-EAP) • Default - Open **Note:** For a Cisco explanation of 802.11 authentication using Open and Network-EAP, see: http://www.cisco.com/en/US/products/hw/wireless/ps4570/products_configuration_example09186a00801bd035.shtml. The Summit Client Utility refers to Network-EAP as LEAP.	

6.1.2.2 Preferred Band for 802.11a/g Radio

When the Radio Mode value is **ABG rates full** or **BGA rates full**, one band (5 GHz for ABG or 2.4 GHz for BGA) is preferred over the other. When trying to associate to an AP, the radio considers APs in the preferred band. If the radio is able to associate to one of these APs, then the radio will not try to associate to an AP in the other band. The only time that the radio attempts to associate to an AP in the non-preferred band is when the radio is not associated and cannot associate in the preferred band. When roaming, the radio considers only APs in the current band (the band in which the radio is currently associated). When an administrator tries to create or edit a profile, SCU determines which radio is operating in the device and populates the available radio mode values according to the radio type. Suppose a profile created for an 802.11a/g card is loaded on a device with an 802.11g card. If a radio mode value of **A rates only**, **ABG rates full**, or **BGA rates full** was set in the profile, then SCU displays a value of **BG rates full**. If the administrator does not save any changes to the profile, then SCU leaves the profile, including the radio mode, unchanged. If the administrator saves any changes to the profile, then SCU saves the radio mode value as **BG rates full**.

6.1.2.3 Ad Hoc

If the administrator selects **Ad Hoc** for radio mode, then the Summit radio uses ad hoc mode instead of infrastructure mode. In infrastructure mode, the radio associates to an AP. In ad hoc mode, the radio associates to another client radio that is in ad hoc mode and has the same SSID and, if configured, static WEP key.

6.1.2.4 Security Settings

EAP type - Extensible Authentication Protocol type used for 802.1X authentication to AP.

Value - None, LEAP, EAP-FAST, PEAP-MSCHAP, PEAP-GTC, PEAP-TLS, EAP-TLS, EAP-TTLS

Default - None

Credentials - Authentication credentials for the selected EAP type. See **6.1.2.6 EAP Credentials** for more information.

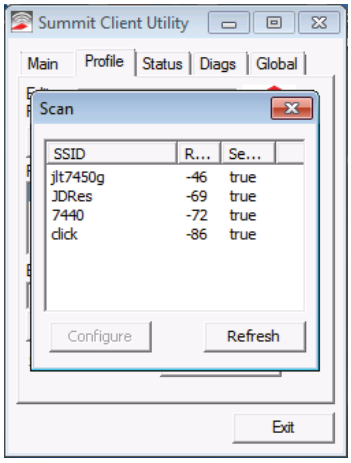
Encryption - Type of encryption (and decryption) used to protect transmitted data. See "Encryption - Cisco TKIP" and "Encryption - WPA Migration Mode and WPA2 Mixed" for more information.

- Value:
  - None - No encryption.
  - WEP - WEP with up to four static keys(40-bit or 128-bit in ASCII or hex) defined under WEP/PSK Keys.
  - WEP EAP - WEP with key generated during EAP authentication.
  - CKIP - WEP with up to four static keys(40-bit or 128-bit in ASCII or hex) defined under WEP/PSK Keys, plus Cisco TKIP and/or Cisco MIC, if configured on AP.
  - CKIP EAP - WEP with key generated during EAP authentication, plus Cisco TKIP and/or Cisco MIC, if configured on AP.
  - WPA-PSK (WPA Personal) - TKIP with PSK (ASCII passphrase or hex PSK) defined under WEP/PSK Keys.
  - WPA-TKIP(WPA Enterprise) - TKIP with key generated during EAP authentication.
  - WPA CCKM(WPA Enterprise) - TKIP with key generated during EAP authentication and with Cisco key management protocol for fast reauthentication.
  - WPA2-PSK with PSK (ASCII passphrase or hex PSK) defined under WEP/PSK Keys.
  - WPA2-AES (WPA2 Enterprise) - AES with key generated during EAP authentication.
  - WPA2 CCKM (WPA2 Enterprise) - AES with key generated during EAP authentication and with Cisco key management protocol for reauthentication.

    Note: For ABGN radios, CKIP and CKIP EAP are unavailable. WEP and WEP EAP are the defaults.
- Default: None

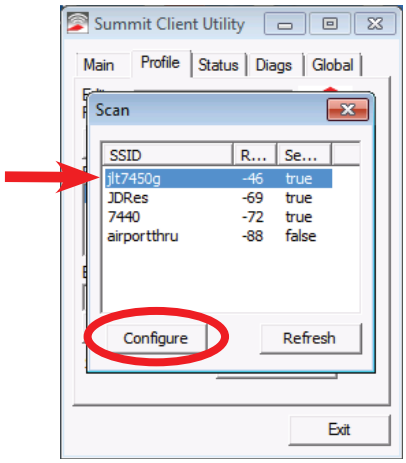
6.1.2.5 Using Scan to Create a Profile

When you tap Scan on the Profile window, SCU displays a list of APs that are broadcasting their SSIDs:

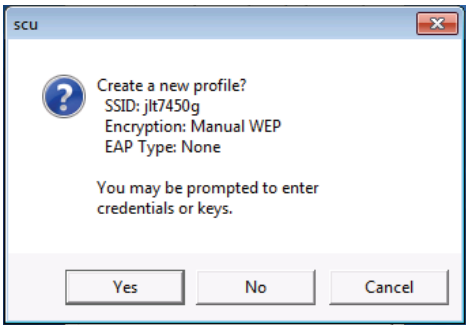


The result shows an AP's SSID, its received signal strength indication (RSSI), and whether or not data encryption is in use (true or false). If more than one AP appears, the list can be sorted by tapping on the column headers. If the scan finds more than one AP with the same SSID, the list displays the AP with the strongest RSSI and the least security. Every five seconds, the Scan window updates the RSSI value for each of the APs in the list. To scan for new APs and view an updated list, tap the Refresh button.

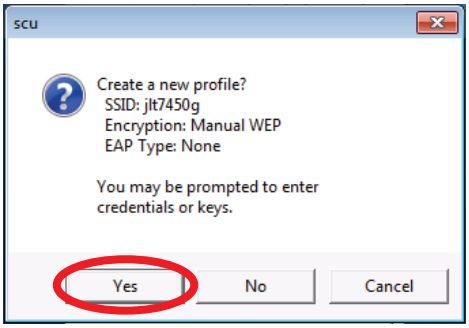
An administrator in SCU can create a profile for any SSID in the list. To do so, either double-tap the row for the SSID or tap the row and tap **Configure**.



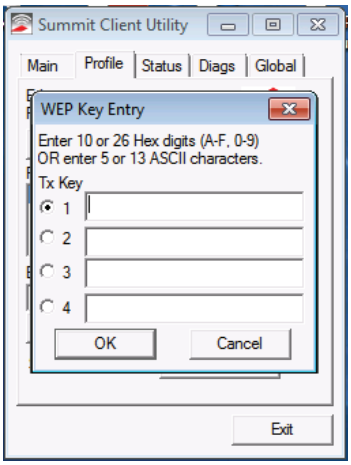
SCU will display a dialog box such as the one shown below:



If you tap the **Yes** button on the dialog box, then SCU will create a profile for that SSID, with the profile name being the same as the SSID (or the SSID with a suffix such as "_1" if a profile with the SSID as its name exists already).



If the AP is using WEP, then SCU will open a dialog box in which you can specify WEP keys.



If the AP is using EAP, then SCU will open a dialog box in which you can specify login credentials for the EAP type (which SCU assumes is LEAP). After you enter information on a dialog box, you will return to the SCU Profile window, where you can view and edit profile settings. If you make any changes, then you must tap the Commit button to save them.

6.1.2.6 EAP Credentials

The 802.1X authentication types PEAP, EAP-TTLS, and EAP-TLS rely upon information in digital certificates that are created by a certificate authority, or CA. To enable a client device to validate (or authenticate) the server used for PEAP, EAP-TTLS, or EAP-TLS authentication, you must provision a root CA certificate and distribute it to that client. You can store the CA certificate in a device's Microsoft certificate store or in a directory with a path that you specify as the value for Certs Path on the SCU Global window. If you don't specify a Certs Path value, then SCU uses for the Certs Path value the path to the certs directory that is off the SCU folder. For EAP-TLS you also must generate a user certificate for each client; that user certificate must be stored in the Microsoft certificate store on the client.

Instead of using digital certificates, EAP-FAST relies upon strong shared-secret keys that are unique to users. These secrets are called protected access credentials (PACs) and can be created automatically or manually. With automatic or in-band provisioning, the PAC is created and distributed to the client device in one operation. With manual or out-of-band provisioning, the PAC is created in one step and then must be distributed to the client device separately. SCU supports PACs created automatically or manually. When you create a PAC manually, you must load it to the directory identified by the Certs Path global setting. Be sure that the PAC file does not have read-only permissions set, or SCU will not be able to use the PAC.

There are no default values for credentials. If the credentials are not specified in the profile then, when the radio tries to associate using that profile, Summit software will display a dialog box that prompts the user to enter the credentials. Summit software will populate the dialog box with the username and password supplied for the previous EAP authentication.

EAP-Type	User	Password	CA Cert	Validate Server	User MS Store	Others
LEAP	Username or Domain/ Username (up to 64 characters)	Password (up to 32 characters)				
EAP-FAST	Username or Domain/ Username (up to 64 characters)	Password (up to 32 characters)				• PAC Filename (up to 32 characters) • PAC Password (up to 32 characters)
PEAP-MSCHAP	Username or Domain/ Username (up to 64 characters)	Password (up to 32 characters)	Filename (up to 32 characters) See Note on CA Cert Field	See Note on Validate Server Checkbox	See Note on Use MS store Checkbox	
PEAP-TGC	Username or Domain/ Username (up to 64 characters)	Password (up to 32 characters)	Filename (up to 32 characters) See Note on CA Cert Field	See Note on Validate Server Checkbox	See Note on Use MS store Checkbox	
PEAP-TLS	Username or Domain/ Username (up to 64 characters)	Password (up to 32 characters)	Filename (up to 32 characters) See Note on CA Cert Field	See Note on Validate Server Checkbox	See Note on Use MS store Checkbox	
EAP-TTLS	Username or Domain/ Username (up to 64 characters)	Password (up to 32 characters)	Filename (up to 32 characters) See Note on CA Cert Field	See Note on Validate Server Checkbox	See Note on Use MS store Checkbox	
EAP-TLS	Username or Domain/ Username (up to 64 characters)		Filename (up to 32 characters) See Note on CA Cert Field	See Note on Validate Server Checkbox	See Note on Use MS store Checkbox	User Cert See Note on User Cert

Notes for EAP Credentials

Note on CA Cert Field: This is the filename of the root certificate authority digital certificate. Leave this blank if the **Use MS Store** checkbox is checked.

Note on Validate Server Checkbox: Check this if using a CA certificate to validate an authentication server. When this is checked, a certificate filename must be entered in the CA Cert field or check the Use MS store checkbox.

Note: Summit strongly recommends the use of server validation with PEAP-GTC.

Note on Use MS Store Checkbox: Check this if the Microsoft certificate store should be used for a CA certificate. This is applicable only when Validate Server is checked.

Note on User Cert: Tap the "..." button to select a user (or station) certificate from the Microsoft certificate store. Do not enter a filename; the user certificate must reside in the Microsoft certificate store. When browsing for a certificate, the pop-up box displays Issued By and Issued To.

Of the seven EAP types supported by SCU, all but EAP-FAST and LEAP rely upon information in digital certificates that are created by a certificate authority (CA). To enable a station device to authenticate the server, provide a root CA certificate and distribute it to that station. The CA certificate can be stored in a unit's Microsoft certificate store or in a specified directory (see Certs Path for additional information regarding a specified directory).

Note: For EAP-TLS, the user must also generate a user certificate for each station. The user certificate must be stored in the Microsoft certificate store on the station.

EAP-FAST relies upon strong shared-secret keys that are unique to users (rather than digital certificates). These keys are called protected access credentials (PACs) and can be created automatically or manually. With automatic or in-band provisioning, the PAC is created and distributed to the station device in one operation. With manual or out-of-band provisioning, the PAC is created in one step and must then be distributed to the station device separately.

SCU supports PACs created automatically or manually. When the user creates a PAC manually, it must be loaded into the directory identified by the Certs Path global setting. Be sure that the PAC file does not have read-only permissions set, or SCU will not be able to use the PAC.

Note: If the user enters a PAC filename in the SCU field, manual provisioning is used. If the user omits the PAC filename, automatic provisioning is used.

6.1.2.7 Encryption

6.1.2.7.1 Cisco TKIP

If the active profile has an Encryption setting of CKIP or CKIP EAP, then the Summit radio will associate or roam successfully to an AP is configured with:

- The SSID and other RF settings of the active profile
- The authentication method of the active profile
- For WEP, the static WEP keys of the active profile
- Any of the following encryption settings:
  - WEP only (no CKIP or CMIC)
  - WEP with CKIP
  - WEP with CMIC
  - WEP with CKIP and CMIC

6.1.2.7.2 WPA Migration Mode and WPA2 Mixed Mode

Summit radios support two special AP settings: WPA Migration Mode and WPA2 Mixed Mode. WPA Migration Mode is a setting on Cisco APs that enables both WPA and non-WPA clients to associate to an AP using the same SSID, provided that the AP is configured for Migration Mode (WPA optional with TKIP+WEP128 or TKIP+WEP40 cipher). In other words, WPA Migration Mode means WPA key management with TKIP for the pairwise cipher and TKIP, 128-bit WEP, or 40-bit WEP for the group cipher. When WPA Migration Mode in use, you can select WPA TKIP or WEP EAP for your Summit radio encryption type.

WPA2 Mixed Mode operation enables both WPA and WPA2 clients to associate to an AP using the same SSID. WPA2 Mixed Mode is defined by the Wi-Fi Alliance, and support for the feature is a part of Wi-Fi certification testing. When WPA2 Mixed Mode is configured, the AP advertises the encryption ciphers (TKIP, CCMP, other) that are available for use, and the client selects the encryption cipher it wants to use. In other words, WPA Mixed Mode means WPA key management with AES for the pairwise cipher and AES or TKIP for the group cipher. When WPA2 Mixed Mode in use, you can select WPA2 AES or WPA TKIP for your Summit radio encryption type.

6.1.2.8 ThirdPartyConfig

If the profile named **ThirdPartyConfig** is selected as the active profile, then SCU works in tandem with WZC or another third-party application for configuration of all radio and security settings for the radio. The third-party application must be used to define the SSID, Auth Type, EAP Type, and Encryption settings. SCU can be used to define the Client Name, Power Save, Tx Power, Bit Rate, and Radio Mode settings. Those SCU profile settings, all SCU global settings, and the third-party application settings are applied to the radio when ThirdPartyConfig is selected as the active profile and a power cycle is performed.

On some devices that run Pocket PC or Windows Mobile, the radio will not associate if WPA with pre-shared keys, or WPA-PSK, is used with WZC. If that is the case for your device, then to use WPA-PSK you must use an SCU profile other than ThirdPartyConfig.

6.1.2.9 EAP-FAST

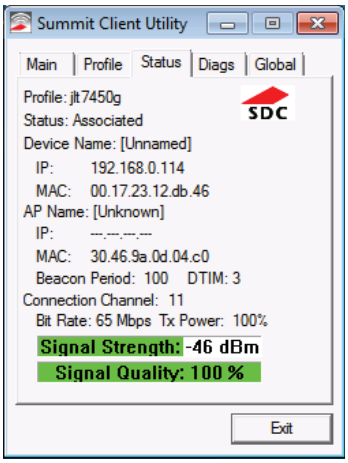
The 802.1X authentication types **PEAP** and **EAP-FAST** use a client-server security architecture that encrypts EAP transactions within a TLS tunnel. **PEAP** relies on the provisioning and distribution of a digital certificate for the authentication server. With **EAP-FAST**, tunnel establishment is based upon strong shared-secret keys that are unique to users. These secrets are called protected access credentials (PACs) and can be created automatically or manually. With automatic or in-band provisioning, the PAC is created and distributed to the client device in one operation. With manual or out-of-band provisioning, the PAC is created in one step and then must be distributed to the client device separately.

SCU supports PACs created automatically or manually. When you create a PAC manually, you must load it to the certs directory on the device that runs SCU. Be sure that the PAC file does not have read-only permissions set, or SCU will not be able to use the PAC.

Note: If you enter a PAC filename in the SCU field, manual provisioning is used. If you omit the PAC filename, automatic provisioning is used.

6.1.3 Status Window

The Status window provides status information on the radio. A sample Status window is shown below:

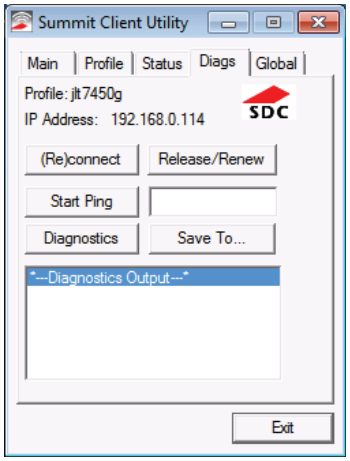


Element	Description	
Profile	The active profile.	
Status	Indicates the current status of the Summit radio. Potential values include:	
	Down	The radio is not recognized by Summit software, possibly because the radio is not installed properly.
	Disabled	The radio has been disabled because **Disable Radio** on the SCU Main window has been tapped. To enable the radio, tap **Enable Radio** on the SCU Main window.
	Not Associated	The radio is not associated to an AP, possibly because no AP for the active profile is in range.
	Associated	The radio is associated to an AP. If the radio is not sending or receiving from the AP, then: • If WEP is being used, then one of the WEP keys in the active profile is invalid. • If WPA-PSK or WPA2-PSK is being used, then the PSK or password is invalid. • If WPA-Enterprise or WPA2-Enterprise is being used, then the radio did not complete EAP authentication successfully.
	<EAP type> Authenticated	The radio is associated to an AP and has completed EAP authentication successfully.
Device Information	• Client name, if defined in active profile • IP address • MAC address	

AP Information	• Name • IP address • MAC address • Beacon period: Amount of time between AP beacons in Kilo-microseconds, where one Ksec equals 1,024 microseconds • DTIM interval: A multiple of the beacon period that specifies how often the beacon contains a delivery traffic indication message(DTIM), which tells power-save client devices that a packet is waiting for them (e.g. a DTIM interval of 3 means that every third beacon contains a DTIM)
Connection Information	• Channel • Transmit power • Data (bit) rate • Signal strength (RSSI), displayed graphically and in dBm – A green color indicates that the RSSI for the current AP is stronger than -70 dBm, which means that the Summit radio should operate consistently at 54 Mbps – A yellow color indicates that the RSSI for the current AP is stronger than -90 dBm but not stronger than -70 dBm, which means that a Summit radio will operate at 802.11g or 802.11a data rates that are less than 54 Mbps – A red color indicates that the RSSI for the current AP(to which the radio is associated) is -90 dBm or weaker, which means that a Summit 802.11b/g radio will operate at 802.11b data rates only • Signal quality (%), a measure of the clarity of the signal, displayed graphically and in dBm -- This value will be lower with a ThirdPartyConfig profile (under Windows Zero Config) than with a standard profile

6.1.4 Diags Window

A sample Diags, or troubleshooting, window is shown below:



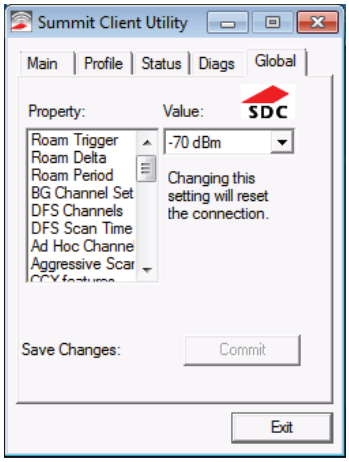
Here are the functions available on the Diags window:

Element	Description
(Re)connect	Initiate a reconnect of the radio: Disable and enable the radio, apply (or reapply) the current profile, attempt to associate to the wireless LAN, and attempt to authenticate to the wireless LAN. SCU logs all activity in the output area at the bottom of the Diags window.
Release / Renew	Obtain a new IP address through DHCP release/renew. SCU logs all activity in the output area at the bottom of the Diags window.
Start Ping / Stop Ping	Start a continuous ping to the address in the edit box next to the button. Once the button is tapped, its name and function changes to Stop Ping. Pings continue until you tap **Stop Ping**, move to a different SCU window (other than Diags or Status), exit SCU, or remove the radio. **Note:** If your device has both a Summit radio and another network adapter active, then pings may go out over the non-Summit network adapter. **Note:** The access point's IP address is the default for a ping although any valid IP address can be manually entered.
Diagnostics	Attempt to (re)connect to an access point and provide a more thorough dump of data than is obtained with (Re)connect. The dump includes radio state, profile settings, global settings, and a BSSID list of access points in the area.
Save To...	Indicate where you want to save the diagnostics file. Tap **Save To...** to open the Save As window. From here, you can change the SDC diagnostics file name, the folder in which SCU saves the file, the format in which the file is saved (the file type), and the location of the saved file (Main memory or System).

Note: When a ping initiated from the Diags window is active, the Status window displays a ping indicator consisting of two lights that flash green (for a successful ping) or red (for an unsuccessful ping).

6.1.5 Global Window

Global settings include radio and security settings that apply to all profiles and settings that apply to SCU itself. An administrator can define and change most global settings on the Global window in SCU:



6.0 Summit Radio

The following radio global settings, which apply to all configuration profiles, can be changed in SCU:

Terms	Definitions
Roam Trigger	When moving average RSSI from current AP is weaker than Roam Trigger, radio does a roam scan where it probes for an AP with a signal that is at least Roam Delta dBm stronger. • Value: -50, -55, -60, -65, -70, -75, -80, -85, -90, or Custom (see note on Custom below the list) • Default: -70
Roam Delta	When Roam Trigger is met, second AP's signal strength (RSSI) must be Roam Delta dBm stronger than moving average RSSI for current AP before radio will attempt to roam to second AP. • Value: 5, 10, 15, 20, 25, 30, 35, or Custom (see note on Custom below the list) • Default: 10
Roam Period	After association or roam scan (with no roam), radio will collect RSSI scan data for Roam Period seconds before considering roaming. • Value: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, or Custom (see note on Custom below the list) • Default: 10
BG Channel Set	Defines the 2.4 GHz channels to be scanned when the radio is contemplating a roam and to determine what APs are available: • Value: Full (all channels); 1,6,11 (the most commonly used 2.4 GHz channels); 1,7,13 (for ETSI and TELEC radios only); or Custom (see note on Custom below the list) • Default: Full
DFS Channels	Support for 5 GHz (802.11a) channels where support for dynamic frequency selection (DFS) is required. • Value: On, Off, Optimized **Note:** When set to Optimized and scanning for the first time, the radio scans all active channels and all available DFS channels. From this scan, the radio creates and maintains a list of up to three DFS channels where beacons were detected. During subsequent scans, the radio still scans all active channels but only scans the DFS channels listed from the first scan (where beacons were detected). When the radio loses or resets the connection, the radio returns to scanning all available DFS channels as it did when scanning for the first time after being set to Optimized. From this scan, the radio again creates a list of DFS channels where beacons were detected. **Note:** The Optimized setting is not supported in the MSD30AG and SSD30AG radios. If DFS Channels is set to Optimized directly in the registry, the setting will function as On (versus Optimized). • Default: Full
DFS Scan Time	Because passive scanning consumes a longer period of time, this feature enables you to determine the dwell (listen) time when passively scanning on a DFS channel. • Value: A number between 20-500 milliseconds (ms) • Default: 120 ms **Note:** When decreasing the scan time (to a value lower than the default) for DFS channels, corresponding changes in the infrastructure's beacon period are recommended. For optimal performance and reliability, Summit recommends a dwell time that is 1.5 times that of the beacon period. For example, if the DFS scan time is set to 30 ms, the beacon period should be adjusted to 20 ms. **Note:** If you adjust this parameter directly in the registry, and configure it to a number outside of the 20-500 ms range, the setting value will return to the default (120 ms).
Ad Hoc Channel	The channel to be used for an ad hoc connection if the active profile has a Radio Mode value of "Ad Hoc" • Value: One of the 2.4 GHz channels (1-14) or UNII-1 channels (36, 40, 44, 48) -- If you select a channel that is not supported by your radio, then SCU uses the default value for this setting. • Default: 1
Aggressive Scan	When this setting is On and the current connection to an AP becomes tenuous, the radio scans for available APs more aggressively. Aggressive scanning complements and works in conjunction with the standard scanning that is configured through the Roam Trigger, Roam Delta, and Roam Period settings. Summit recommends that the Aggressive Scan global setting be On unless there is significant co-channel interference because of overlapping coverage from APs that are on the same channel. • Value: On or Off • Default: On
CCX Support	Use of Cisco information element (IE) and CCX version number; support for CCX features. • Value: – Full: Use Cisco IE and CCX version number; support all CCX features – Optimized: Use Cisco IE and CCX version number; support all CCX features except AP-assisted roaming, AP-specified maximum transmit power, and radio management – Off: Do not use Cisco IE and CCX version number • Default: Optimized **Note:** For 30AG (MSD30AG and SSD30AG) radio modules, this parameter is disabled. The default is Optimized.
WMM	Use of Wi-Fi Multimedia Extensions, also known as WMM. • Value: On, Off • Default: Off **Note:** For ABGN radio modules, this parameter is disabled.
Auth Server	Type of authentication server being used for EAP. • Value: – Type 1: Cisco Secure ACS or another server that uses PEAPv1 for PEAP with EAP-MSCHAPV2 (PEAP-MSCHAP) – Type 2: A different authentication server, such as Juniper Networks Steel Belted RADIUS, that uses PEAPv0 for PEAP-MSCHAP • Default: Type 1
TTLS Inner Method	Authentication method used within secure tunnel created by EAP-TTLS: • Value: – Auto-EAP: Any available EAP method – MSCHAPV2 – MSCHAP – PAP – CHAP – EAP-MSCHAPV2 • Default: Auto-EAP
PMK Caching	When WPA2 is in use, type of Pairwise Master Key (PMK) caching to use—See the section on PMK Caching. • Value: Standard or OPMK • Default: Standard **Note:** When switching from Standard to OPMK, you must initiate a suspend resume of the device. Only tapping Commit does not cause the change to take effect.

Frag Thresh	If packet size (in bytes) exceeds threshold, then packet is fragmented • Value: An integer from 256 to 2346 • Default: 2346 **Note:** For 30AG (MSD30AG and SSD30AG) radio modules, this parameter is disabled.
RTS Thresh	Packet size above which RTS/CTS is required on link • Value: An integer from 0 to 2347 • Default: 2347 **Note:** For 30AG (MSD30AG and SSD30AG) radio modules, this parameter is disabled.
RX Diversity	How to handle antenna diversity when receiving data from AP • Value: – On-Start on Main: On startup use main antenna – On-Start on Aux: On startup, use auxiliary antenna – Main only: Use main antenna only – Aux only: Use auxiliary antenna only **Note:** Summit does not support the AUX antenna as a single-antenna solution. • Default: On-Start on Main **Note:** For ABGN and 30AG (MSD30AG and SSD30AG) radio modules, this parameter is disabled.
TX Diversity	How to handle antenna diversity when transmitting data to AP • Value: – Main only: Use main antenna only – Aux only: Use auxiliary antenna only **Note:** Summit does not support the AUX antenna as a single-antenna solution. – On: Use diversity • Default: On **Note:** For 30AG (MSD30AG and SSD30AG) radio modules, this parameter is disabled.
LED	Use of LED; available only with MCF10G • Value: On, Off • Default: Off

If SCU displays a value of "Custom" for a global setting, then the operating system registry has been edited to include a value that is not available for selection on the Global window. Selecting Custom has no real effect. If SCU displays a value other than Custom and you select the value of Custom and tap Commit, then SCU reverts to the value that it displayed before you selected Custom.

The following SCU global settings, which apply to SCU and other Summit applications, can be changed in SCU:

Hide Passwords	If this is On, then SCU as well as EAP authentication dialog boxes mask passwords and other sensitive information, such as WEP keys. • Value: On, Off • Default: Off
Admin Password	Password that must be specified when Admin Login button pressed. • Value: A string of up to 64 characters • Default: SUMMIT
Certs Path	Directory where certificate(s) for EAP authentication and PAC files are housed. • Value: A valid directory path of up to 64 characters • Default: Depends on device
Auth Timeout	Specifies the number of seconds that Summit software will wait for an EAP authentication request to succeed or fail. If authentication credentials are specified in the active profile and the authentication times out, then association will fail. If authentication credentials are not specified in the active profile and the authentication times out, then the user will be re-prompted to enter authentication credentials. • Value: An integer from 3 to 60 • Default: 8
Ping Payload	Amount of data in bytes to be transmitted on a ping. • Value: 32, 64, 128, 256, 512, 1024 • Default: 32
Ping Timeout ms	Amount of time in milliseconds that transpires without a response before ping request is considered a failure. • Value: An integer from 1 to 30000 • Default: 5000
Ping Delay ms	Amount of time in milliseconds between successive ping requests • Value: An integer from 0 to 7200000 • Default: 1000

When you change global settings and tap Commit, the changes take effect immediately. The only exception is the WMM setting; if you change it, you must do a power cycle or suspend/resume on the device to cause the change to take effect. SCU provides you with a warning about the required power cycle.) To cause global settings changes to take effect without a power cycle, Summit software may have to reset and re-establish the WLAN connection between the Summit radio and the AP.

If you make changes without tapping Commit and attempt to move to a different SCU window, SCU will display a warning message and give you the option of saving your changes before you leave the Global window.

A few global settings can be defined or set only through a separate utility such as the Summit Manufacturing Utility, which Summit makes available only to device manufacturers and not to their customers.

6.1.6 PMK Caching

PMK caching is an alternative to CCKM supported with WPA2. The goal of PMK caching is to speed up roaming between APs by accomplishing 802.1X reauthentications without communicating with the authentication server. When a client does an initial authentication to the WLAN infrastructure, both sides derive the information needed for reauthentications.

If there are no controllers, then standard PMK caching is used, and reauthentication information is cached only on the initial AP. When the client tries to reauthenticate to that AP, the client and the AP use the cached information to do the four-way handshake to exchange keys. If there are controllers, then opportunistic PMK caching is used, and reauthentication information is cached on the controllers. When the client tries to reauthenticate, the client and the controller behind the AP use the cached information to do the four-way handshake to exchange keys.

Use the PMK Caching global setting to configure the type of PMK caching supported by your infrastructure. If the Summit radio is configured for one type of PMK caching and the infrastructure supports the other type, then PMK caching will not work, and every roam will require a full 802.1X authentication that requires interaction with an authentication server.

If the active profile has an Encryption setting of WPA2 CCKM, then the Summit radio ignores the PMK Caching global setting and attempts to use CCKM.

7.0 BlueTooth

7.1 Introduction

BlueSoleil is a Windows-based software from IVT that allows your Bluetooth® enabled desktop or notebook computer to wirelessly connect to other Bluetooth enabled devices. BlueSoleil allows MS Windows users to wirelessly access a wide variety of Bluetooth enabled digital devices, such as cameras, mobile phones, headsets, printers, and GPS receivers. You can also form networks and exchange data with other Bluetooth enabled computers or PDAs.

7.1.1 Bluetooth Functions

In order to connect and share services via Bluetooth wireless technology, two devices must support the same Bluetooth Profile(s) as well as opposite device roles (i.e., one must be the server, and the other must be the client).

Bluetooth enabled devices often support multiple profiles, and if involved in multiple connections, can perform different device roles simultaneously.

BlueSoleil supports the following Bluetooth functions (Profiles) in the following device roles:

Bluetooth Functions (Profiles)	Client	Server
AV Headphone*	√	√
Basic Image Profile	√	√
Dial-Up Networking	√	
Fax	√	
File Transfer	√	√
Headset*	√	√
Human Interface Device	√	
LAN Access	√	√
Object Push	√	√
Personal Area Networking	√	√
Printer	√	
Serial Port	√	√
Synchronization	√	√

Notes:

- Only one Headset or AV Headphone connection can exist at a time, since since there is only one virtual Bluetooth audio device.
- The Headset and AV Headphone Profiles do not work on Windows 98SE or Windows Me.

7.1.2 Main Window

By default, BlueSoleil starts with the Main Window open. Use the Main Window to perform your primary connection operations. The Main Window displays the local device (red ball) as well as the remote devices detected in range.

Note: For more complete information about the Main Window (including the icon meanings) as well as information about the Service Window and BlueSoleil menus, please refer to **7.4**.

Different icons distinguish different types of remote devices.

At the top of the Main Window are Service Buttons. After you search for the services supported by a remote device, the supported services of the selected device will be highlighted.

Local Device — Basic Operations:

- Hover your mouse over the red ball to display the local device's Bluetooth name and address.
- Click on the red ball to start or stop searching for Bluetooth devices in range.
- Right-click on the red ball to display a pop-up menu of related operations (e.g., General Inquiry, My Services, Security, etc.).

Remote Devices — Icon Meanings

- White — Idle. The normal state of the device.
- Yellow—Selected. You have selected the device.
- Green — Connected. The device is connected to your local device.

Remote Devices — Operations

- Single-click to select.
- Double-click to search for the services supported by the device.
- Right-click to display a pop-up menu of related operations (e.g., Refresh Devices, Pair Devices, Connect, etc.).

Services — Icon Meanings

- White — Idle. The normal state.
- Yellow — Available. The service is available on the selected device.
- Green — Connected. The service is active in a connection with the remote device.

Services — Operations

- Hover your mouse over the service icon to display the name of the service.
- Single-click on the service icon to connect.
- Right-click on the service icon to display a pop-up menu of related operations.

7.2 Basic Operations

7.2.1 Start BlueSoleil

1. Click on the BlueSoleil icon on your desktop, or go to:

   Start | Programs | IVT BlueSoleil | BlueSoleil

2. The first time BlueSoleil is launched, the Welcome to Bluetooth screen will appear. Assign your Windows system a name and device type, to be shown to other Bluetooth enabled devices. In most cases, you should leave the security setting checked.
3. Click **OK**.

7.2.2 Search for Other Bluetooth Enabled Devices

Before it can connect, your computer must first detect other Bluetooth enabled devices in range.

Initiate a Device Search

1. Make sure that the Bluetooth enabled device you wish to connect to is turned on, with sufficient battery power, and set in discoverable mode. Have any necessary passkeys ready. If necessary, you may also need to enable the service you want to use on the remote device. Refer to the remote device's user documentation for instructions.

   If you haven't done so already, you may also want to assign the device a Bluetooth name. Refer to the device's user documentation for instructions.

2. In the Main Window, click on the red ball to start the device search.
3. Alternatively, click:

   My Bluetooth | My Device Inquiry

   or

   View | Refresh Devices

   or

   press **F5**

4. After a few seconds, an icon will appear around the center ball for each Bluetooth enabled device detected within the radio range.

Note:

- The Main Window can display only eight discovered devices at a time. If BlueSoleil discovered more than eight devices, use the scroll bar to view the remaining devices discovered by BlueSoleil.
- To sort the devices by device name, device address, or device type, click:

  View | Arrange Devices

5. Wait several seconds until BlueSoleil reports the name of each device.
6. If the device you want is not listed, make sure that the device is turned on and discoverable and try searching again. You have multiple options for starting another search:
   - If you start another search by double-clicking on the red ball or clicking —

     My Bluetooth | My Device Inquiry

     or

     View | Refresh Devices

     then the list of previously detected devices will not be cleared.
   - If you start another search by pressing F5, then the list of previously detected devices will be cleared.

7.2.3 Establish Connection

Note: These are generic instructions for any type of Bluetooth enabled device. Refer to the instructions in **7.3** for specific details for the type of service you plan to use.

Normally, a connection is initiated from the client. Check the chart in **7.1.1** to verify which device role BlueSoleil supports for the service you wish to use.

- On the server side, start the service
- On the client side, initiate the connection

7.2.3.1 Start the Service

If you would like to use your computer as a server in a Bluetooth connection, you must first start (enable) the appropriate service(s) on your system.

1. To access the Service Window, click:

   View | Service Window

2. If the icon for a service is highlighted (yellow), then the service has already been started. If the icon is white, then you need to start the service in order to use it. Right-click the icon. In the pop-up menu, select Start Service. The icon should now be highlighted (yellow). Serial Port icons will also report which COM port is assigned to them.

Note:

- Icons will appear only for Bluetooth functions (Profiles) which BlueSoleil supports in the Server device role. See chart in **7.1.1 Bluetooth Functions**.
- Depending on your system, multiple icons for Serial COM ports may appear.

3. After you have started the service in BlueSoleil, now you are ready to initiate the connection from the remote device. For instructions, refer to the user documentation for the remote device.

7.2.3.2 Initiate the Connection

If you would like to use your computer as a client in a Bluetooth connection, make sure that you have started (enabled) the service on the remote device. Otherwise, BlueSoleil will not be able to discover the service and connect to it. For instructions, refer to the device's user documentation.

1. Return to the Main Window by clicking:

   View | Main Window

2. Double-click on the icon for the device you wish to connect to. BlueSoleil will begin to search for information about which services the device supports.
3. After the search, icons will be highlighted (yellow) at the top of the BlueSoleil Main Window for services that are supported by the device. Verify that the service you want to use is supported.
4. Right-click on the device icon. In the pop-up menu, click Connect, then select the service. BlueSoleil will start the connection. Depending on the security settings of each device, you may need to enter the same passkey on each device in order to bond the two devices.
5. A screen may appear asking if you want to set up automatic connections. Click **Yes** or **No**.
6. If you are connecting to a phone, your phone may ask if you want to

ask the BlueSoleil computer to your device list. Enter Yes and enter a passkey.

7. When the devices have successfully connected, the device icon in the Main Window will turn green, and a green line will appear between the red ball and the device icon. A red dot will travel along the green line from the client to the server. A signal strength icon will also appear next to the device icon.

   The BlueSoleil icon in the task tray will also turn green to indicate an active connection.

Note: A red check mark will appear next to the name of any device that you have previously paired with your computer.

8. Depending on which services you are using, additional screens may appear, and/or you may need to configure additional connection settings (e.g., user name, password, COM port number, etc.). Refer to the instructions in **7.3** for your specific service. After configuring the appropriate connection settings, you should be ready to use your application.
9. To end a connection, in the Main Window, right-click on the icon for a connected device. In the pop-up menu, click Disconnect.

Note: You can only disconnect this way if your computer is acting as a client device. If your computer is acting as a server device, then you can disconnect in BlueSoleil by clicking:

View | Service Window

then right-clicking on the service icon. In the pop-up menu, click Stop Service. Alternatively, you can disconnect from the remote device.

7.2.4 Bluetooth Security

To modify your connection's security settings, click:

My Bluetooth | Security

BlueSoleil offers three security levels:

- **Low** (Security Mode 1, Non-secure)

  No security procedure is needed for connections.

- **Medium** (Security Mode 2, Service level enforced security)

  Authentication or Authorization is requested when a specific service is accessed by other Bluetooth enabled devices. If two devices are connecting for the first time, or if two devices do not have a trusted relationship, then the same passkey must be provided on both sides to complete the Authentication. This mode allows you to assign different access rights for each service supported by the server device.

- **High** (Security Mode 3, Link level enforced security)

  If either of two devices is in Mode 3, Authentication is requested whenever a link connection is initiated between two Bluetooth enabled devices. The passkey must be provided on both sides to complete Authentication.

Note: In Security Mode 2, the user can add each authenticated device into a trusted device list to expedite future connections.

7.3 Getting Started

7.3.1 AV Headphone

The AV Headphone Profile enables use of a Bluetooth enabled headphone to listen to high-quality stereo music played on a computer.

Typical Usage

- Listen to music using a Bluetooth enabled AV headphone.

Step 1: Connect to the AV headphone, following the instructions in **7.2.3**.

Step 2: Play music using media player software on your computer. Music will transmit wirelessly to the headphone.

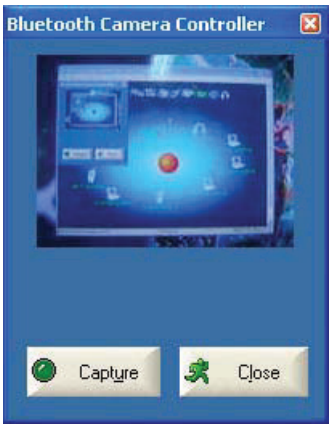
7.3.2 Basic Imaging

The Basic Imaging Profile (BIP) enables users to receive pictures from a Bluetooth enabled digital camera, mobile phone, or other compatible device. It also enables remote control of shooting, display, and other imaging functions.

Typical Usage

- Control camera to take pictures
- Receive pictures sent from BIP-enabled digital devices

Step 1: Connect to the camera, following the directions in Section 7.2.4. A Bluetooth Camera Controller will appear.



Step 2: Click the button to capture the image. The captured image will be transmitted to your computer and displayed.

Receive Pictures

Step 1: Assign the directory where you would like to save image files pushed from the client device. Click My Services | Properties. Click on the Basic Image Push tab. In the Set the image directory field, browse to select the file location. Click OK.

Step 2: Start the BIP service, following the directions in **7.2.3**.

Step 3: Send pictures from the remote device. For instructions, refer to the user documentation for the remote device.

7.3.3 Dial-up Networking

The Bluetooth Dial-up Networking (DUN) Profile enables users to wirelessly dial-up to the Internet through a Bluetooth enabled modem or mobile phone that supports the DUN Profile.

7.0 Bluetooth

Typical Usage

• Dial-up to the Internet via a Bluetooth enabled mobile phone.

• Dial-up to the Internet via a Bluetooth enabled modem.

Dial-up to the Internet via a Bluetooth enabled mobile phone.

Step 1: Connect to the phone's Dial-Up Networking Service, following the instructions in **7.2.3**.

Step 2: The Dial-Up Dialog will appear. Enter the dial-up number, User name, and Password. Make sure the correct dial-up number is entered, then click on the Dial button.

Note: The default dial-up number *99***1# only works with certain GPRS phones and service providers in the United States. If necessary, enter the correct dial-up number for your Internet Service Provider (ISP).

Note: After you successfully connect, a screen will ask if you would like to create a dial-up shortcut on your desktop. This would allow you to conveniently dial up and connect by simply clicking on the shortcut, without having to manually start BlueSoleil. Alternatively, after starting BlueSoleil, you can start the shortcut by clicking **Tools | My Shortcuts**.

Dial-up to the Internet via a Bluetooth enabled modem.

Step 1: Connect to the modem's Dial-Up Networking Service, following the instructions in **7.2.3**.

Step 2: The Dial-Up Dialog will appear. Enter the dial-up number, User name, and Password. Enter the correct dial-up number, then click on the Dial button.

Note: The default dial-up number *99***1# does NOT work with modems. You need to enter the correct dial-up number for your Internet Service Provider (ISP).

Step 3: Use your email, Internet browsing or other application that utilizes a dial-up connection.

Note: After you successfully connect, a screen will ask if you would like to create a dial-up shortcut on your desktop. This would allow you to conveniently dial up and connect by simply clicking on the shortcut, without having to manually start BlueSoleil.

7.3.4 FAX

The Bluetooth Fax Profile enables users to send faxes from a computer via a Bluetooth enabled mobile phone or modem.

Typical Usage

- Send fax via a Bluetooth enabled mobile phone.
- Send Fax via a Bluetooth enabled modem.

Send fax via a Bluetooth enabled mobile phone

Step 1: Connect to the mobile phone's fax service, following the directions in **7.2.3**.

Step 2: Use your fax software to send the message.

Send fax via a Bluetooth enabled modem

Step 1: Connect to the modem's fax service, as described in **7.2.3**.

Step 2: Start your fax software. Configure your fax software for the Bluelet Fax Modem (NOT the Bluelet Modem). Refer to your fax software's user documentation for instructions.

Step 3: Use your fax software to send the message.

7.3.5 File Transfer

The File Transfer Profile (FTP) enables users to transfer files and/or folders between Bluetooth enabled laptops, desktops, PDAs, mobile phones, etc.

Typical Usage

- Connect to a Bluetooth enabled mobile phone and transfer files or folders to/from the phone.
- Share a folder on your computer with other Bluetooth enabled devices.
- Access a shared folder on another Bluetooth enabled device.

7.3.5.1 Connect to a Mobile Phone

Step 1: Connect to the mobile phone's FTP service, following the instructions in **7.2.3**.

Step 2: The phone's folders are shown in a window. Users can copy/paste/delete files or folders.

7.3.5.2 Share a Folder on Your Computer with other Bluetooth-Enabled Devices

Select the folder to be used for file sharing and define the remote user privileges.

Step 1: Click:

My Services | Properties

Step 2: Click on the File Transfer tab.

Share this folder: Browse to select the folder you would like to share.

Share Permissions: Select Read and Write to allow others to copy, paste or delete files/folders in this folder. Select Read Only to allow others to only browse and copy files/folders from this folder.

Step 3: Start the FTP service in BlueSoleil, following the instructions in **7.2.3**. Do not initiate the connection in BlueSoleil.

Step 4: Browse your computer from the remote device. For instructions, refer to the user documentation for the remote device. When the remote device attempts to connect to your computer, the Bluetooth Service Authorization screen may appear. Click **Yes**.

Step 5: After successfully connecting, the remote device can browse, copy, paste, and/or delete files on your computer, depending on the remote folder privileges you allowed. For instructions, refer to the user documentation for the remote device.

7.3.5.3 Access a Shared Folder on Another Bluetooth Enabled Device

Step 1: On the remote device, designate the folder/files to share. Enable file sharing on the remote device. For instructions, refer to the user documentation for the remote device.

Note: If you do not enable file sharing on the remote device, BlueSoleil will not be able to discover the device's file sharing service.

Step 2: Start the FTP service and initiate the connection in BlueSoleil, following the instructions in **7.2.3**.

Step 3: A Remote Shared Folder screen will appear, displaying shared files/folders on the remote device, Use the screen to browse, copy, paste, and/or delete files, depending on your folder privileges.

7.3.6 Headset

The Headset Profile enables users to use a Bluetooth enabled headset as wireless earplug or microphone.

Typical Usage

Use Headset as a device for audio input/output.

Step 1: Connect to the Bluetooth enabled headset, following the directions in **7.2.3**.

Step 2: Play music on your computer, or chat using network meeting tools. You may need to press a multifunction button on your headset to transmit audio between the computer and the headset.

Note: For most Bluetooth enabled headsets, after you have successfully connected for the first time, you can quickly reconnect to BlueSoleil by simply pressing a multifunction button on the headset.

7.3.7 Human Interface Device

The Bluetooth Human Interface Device (HID) Profile enables users to use Bluetooth enabled HID Devices such as keyboards, mice or joysticks to control your computer.

Typical Usage

Connect a Bluetooth enabled Mouse and a Keyboard to Your Computer

Step 1: Connect the Bluetooth enabled mouse to your computer, following the instructions in **7.2.3**.

Step 2: Connect the Bluetooth enabled keyboard to your computer, following the instructions in **7.2.3**. Before you can use BlueSoleil to connect, you may need to press a button on the keyboard to make it discoverable.

Note:

- The first time the mouse or keyboard is connected to the computer, the Found New Hardware Wizard will automatically launch. In the first screen of the wizard, DO NOT INSERT ANY CD, click **Next**.
- Follow all the screens until the wizard is completed. If the wizard reappears, cancel the wizard. The mouse or keyboard should be enabled.
- The Bluetooth enabled mouse/keyboard can automatically reconnect to the computer after successfully establishing the initial connection.

7.3.8 LAN Access

The Bluetooth LAN Access Profile (LAP) allows users to access a Local Area Network (LAN) via a Bluetooth enabled LAN access point.

Typical Usage

- Access a LAN via a Bluetooth-enabled LAN Access Point (AP)
- Use your computer as a LAN Access Point

— Access a LAN via a Bluetooth-enabled LAN AP

Step 1: Connect to the LAN AP's LAP service, following the instructions in **7.2.3**.

Step 2: In the Connect Bluetooth LAP Connection dialog, enter the user name and password if necessary. Click Connect.

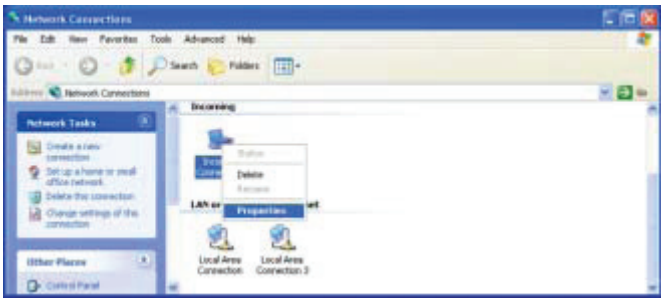
— Use the computer as a LAN AP (Advanced Users Only)

Step 1: Start the Bluetooth LAN Access service on BlueSoleil, following the instructions in **7.2.3**.

Step 2: Specify any static IP addresses necessary for LAP clients.

(Alternatively, you can use DHCP to have the system dynamically assign IP addresses).

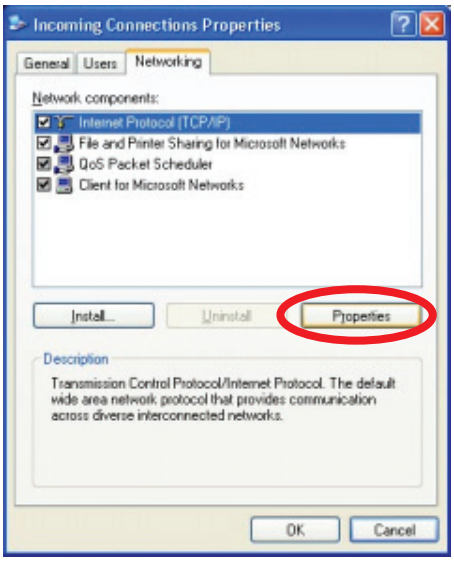
(1) In the Network Connections window, right-click Incoming Connection, then select Properties (Figure 3.3).



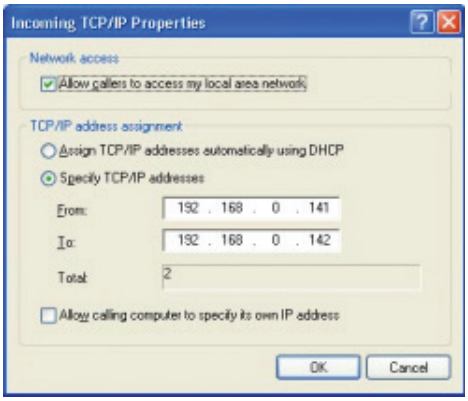
(2) Select:

Incoming Connections Properties | Networking -> Internet Protocol (TCP/IP)

and click on the Properties button.



(3) Select Specify TCP/IP addresses and enter the range of IP addresses assigned to LAP clients.



7.3.9 Object Push

The Bluetooth Object Push Profile (OPP) enables users to send and receive Personal Information Management (PIM) data objects (including messages, notes, calendar items, and business cards) to and from a Bluetooth enabled PDA or mobile phone.

The objects supported include:

- Contacts (*.vcf)
- Calendar items (*.vcs)
- Notes (*.vnt)
- Messages (*.vmg)

Typical Usage

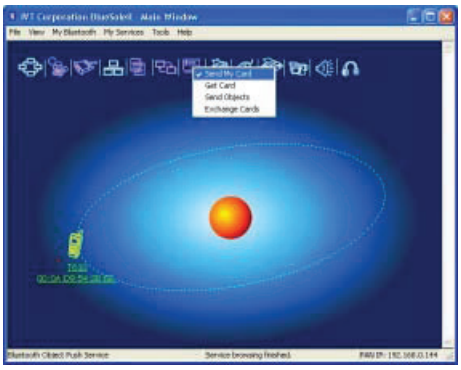
- Push objects to a Bluetooth enabled mobile phone or PDA
- Receive objects from a Bluetooth enabled mobile phone or PDA

Note: If you would like to push PIM objects to a PDA, make sure that the PDA is ready to receive a PIM object before you start. If necessary, enable Object Push on the PDA. For instructions, refer the PDA's user documentation.

7.3.9.1 Push Objects to a Bluetooth-Enabled Mobile Phone

There are two methods to push objects:

Method 1: From BlueSoleil Main Window: Double-click on the mobile phone or PDA icon to browse for service information. The Object Push Service icon should be highlighted at the top of the screen. Right click the Object Push Service icon, and in the pop-up menu click Send My Card.



- ***Send My Card:***

  Send your default business card.

- ***Get Card:***

  Get the phone's default business card.

- ***Send Objects:***

  Select objects (PIM files ending in .vcf, .vcs, .vnt, or .vmg) and send them to the phone.

- ***Exchange cards:***

  Have your computer and the phone to exchange their default business cards.

Method 2: From MS Outlook:

(1) Select the contact that you would like to send.

(2) In Outlook, click on the Push button on the toolbar, or click:

File | Push

(3) The Bluetooth Neighbors screen will appear. In the device list, select the phone or PDA that you wish to push the contact to. Click on the Push button.

7.3.9.2 Receive Objects from a Bluetooth Enabled Mobile Phone

Step 1: Configure the parameters for the object push. From the Main Window, click My Services | Properties. Click on the Object Push tab.

Step 2: Start the Object Push service, following the instructions in **7.2.3**. Do not initiate a connection, only start the service so that your computer will be ready to receive objects.

Step 3: Send objects from the phone. For instructions, refer to your phone's user documentation.

Notes:

- BlueSoleil creates a Bluetooth folder (with Inbox and Outbox subfolders) in your My Documents folder for use with Object Push. The Inbox is used to save objects received from other devices. The Outbox is used to save objects sent out from your computer.
- Your can set your default business card by clicking

  My Services | Object Push

  In the Send My Business Card field, browse to select a contact as your default business card.

7.3.10 Personal Area Networking

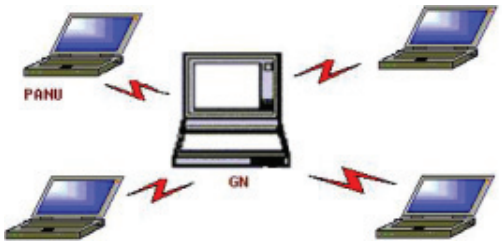
The Bluetooth Personal Area Networking (PAN) Profile enables PCs, laptops, PDAs, and other Bluetooth enabled devices to form either of two kinds of PAN networks. In a Group ad-hoc Network (GN), which functions as an isolated network, multiple PAN Users (PANUs) are linked together via a GN controller.

Alternatively, a PAN can consist of multiple PANUs linked to a Network Access Point (NAP), which provides access to external Local Area Network (LAN) infrastructure. BlueSoleil supports all three of these device roles — GN (controller), PANU, and NAP.

Typical Usage

- Group Ad-hoc Network (Peer-to-peer networking) — One device

acts as the GN, and others function as PANU devices. These computers can visit each other or use an application based on TCP/IP.



- Access a LAN via a Network Access Point (or a Computer Acting as a NAP). After the computers connect to the NAP, they become members of the LAN and can directly communicate with other computers in the LAN.

7.3.10.1 Connecting the PAN User (PANU)

Step 1: Connect to the server's Personal Area Network service, following the instructions in **7.2.3**.

Step 2: Wait a few seconds for BlueSoleil to obtain and display your computer's IP address.

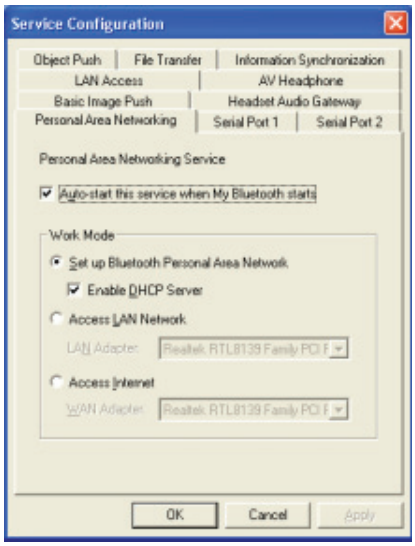
7.3.10.2 Configuring the NAP/GN

Click Bluetooth Service | Properties and click on the Personal Area Network tab.

Scenario 1 — Group Ad-hoc Network

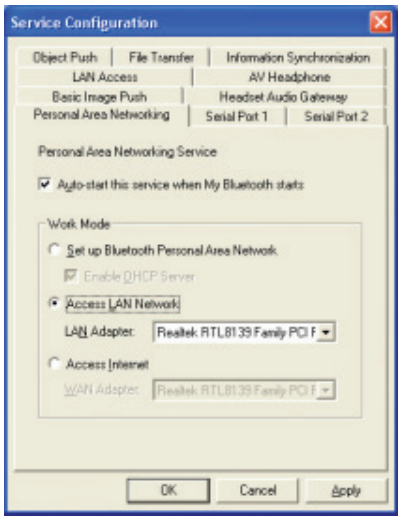
Select Set up Bluetooth Personal Area Network and Enable DHCP Server (Figure 3.9).

A DHCP server will be started on the GN. The PANU can obtain an IP address automatically from this DHCP server if the PANU does not set static IP address for the BT Network Adapter.



Scenario 2 — Access LAN via PAN-NAP

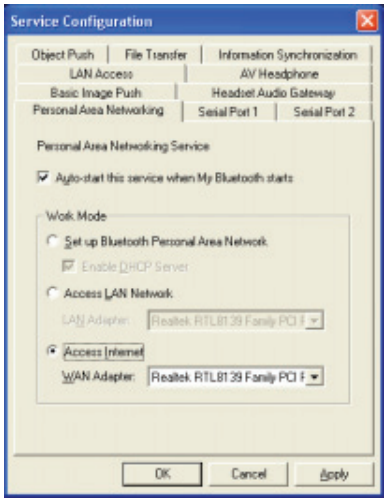
Select Access LAN Network and select a physical network adapter, through which the NAP connects to a LAN, as the LAN Adapter (Figure 3.10).



Scenario 3 — Access the Internet via NAP

Select Access Internet and select a physical network adapter, through which the NAP connects to Internet, as the WAN Adapter (Figure 3.11). It will automatically enables NAT (Network Address Translation, please refer to Windows Help Topic) function and a DHCP server.

Note: The BT Network Adapter on the PANU side must be set to obtain an IP address automatically. The IP address is in the form of 192.168.2.xxx, such as 192.168.2.1.



7.3.11 Printer

The Bluetooth Printer Profile (HCRP) enables your computer to connect to a Bluetooth enabled printer.

Typical Usage

Print documents on a Bluetooth enabled Printer.

Step 1: Connect to the printer's printer service.

(a) If your computer does not have the correct printer drivers installed, BlueSoleil will prompt you to do so. Install the

driver for the printer, and remember to set the printer port to the correct COM port number. To determine the correct COM port number, in the Main Window, right-click on the device icon. In the pop-up menu, select Status.

(b) If the printer driver has been installed, a message indicates that the printer is ready.

Step 2: Print documents using the Bluetooth enabled printer. In the application, be sure to select the correct printer and printer port.

7.3.12 Serial Port

The Bluetooth Serial Port Profile (SPP) provides PCs, laptops, PDAs, GPS receivers, cordless serial adapters, and other Bluetooth enabled devices with a virtual serial port, enabling them to connect with each other wirelessly via Bluetooth instead of with a serial cable.

BlueSoleil supports four Bluetooth Serial Ports for outgoing connections and two Bluetooth Serial Ports for incoming connections.

Typical Usage

Connect to other Bluetooth enabled devices via the Serial Port Connect to a PDA.

Step 1: Connect to the PDA's Serial Port service, following the instructions in **7.2.3**.

Step 2: Use ActiveSync or any other application that uses a serial connection.

Note:

- Serial Port Auto-Connection function

  Once a target device is assigned to a specific serial port, (e.g., COM5), whenever an application opens that serial port number, BlueSoleil will automatically connect to the target device. Similarly, whenever an application closes the Bluetooth serial port, BlueSoleil will stop the connection. To check which devices are assigned to which COM ports, click Tools | Configurations | Connect With.

- Some applications only allow you to use a limited range of COM port numbers. If the application does not allow you to use a COM port number assigned by BlueSoleil, you will not be able to use BlueSoleil with your application.

7.3.13 Bluetooth Synchronization

The Bluetooth Synchronization (SYNC) Profile enables users to synchronize PIM objects on their computer with that of other Bluetooth enabled computers as well as Bluetooth enabled mobile phones, PDAs, and other devices.

Four kinds of objects are supported:

- Contacts (*.vcf)
- Calendars (*.vcs)
- Notes (*.vnt)
- Messages (*.vmg)

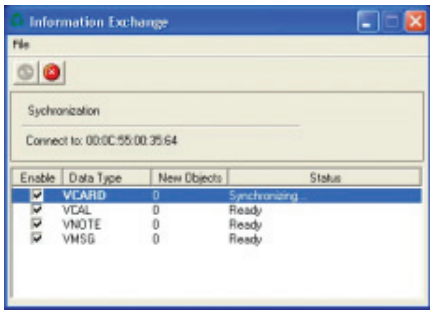
Supported MS Outlook versions: Outlook 2000, Outlook 2002 (xp), Outlook 2003.

Typical Usage

Synchronize your computer with a Bluetooth enabled mobile phone.

Step 1: Connect to the mobile phone's Synchronization service, following the instructions in **7.2.3**.

Step 2: A synchronization dialog will appear (refer to Figure 3.12). Click on the Start button to synchronize. Contacts, calendars, notes and emails in MS Outlook will be synchronized with those on the phone.



Note:

- Users can start synchronization from MS Outlook using the Bluetooth Add-In menus and buttons installed with BlueSoleil.
- BlueSoleil can act as synchronization server. Click My Services | Properties. Click on the Information Synchronization tab, and select the type of PIM objects that you would like to synchronize.

7.4 BlueSoleil User Guides

7.4.1 BlueSoleil Environment

7.4.1.1 Main Window

The Main Window displays the local device (red ball) and the remote devices detected in range. Connecting and disconnecting operations are conducted here. Connections are indicated by green dashed lines between the local device and connected remote devices.

By default BlueSoleil starts with the Main Window open. To return to the Main Windows after switching views, click **View | Main Window**.

7.4.1.1.1 Local Bluetooth Device

The Local Bluetooth enabled device, known as "My Device," represents the user's computer that is running BlueSoleil.

— Operations

- Hover your mouse over the red ball to display the local device's Bluetooth name and address.
- Click on the red ball to start or stop searching for Bluetooth devices in range.
- Right-click on the red ball to display a pop-up menu of related operations (e.g., General Inquiry, My Services, Security, etc.).

7.4.1.1.2 Remote Bluetooth Devices

Remote devices are other Bluetooth enabled devices that are in the radio range of your local device. BlueSoleil uses different icons to indicated different types of remote devices.

Personal Computer		Laptop	
Modem		Mobile Phone	
PDA		LAN Access Point	
Keyboard		Mouse	
Microphone		HiFi Audio	
Loud Speaker		Headset	
Printer		Scanner	
Fax		Camera	
Game Controller		Server	
Unknown Device			

— Icon Meanings

Remote devices can be in any of three states, which BlueSoleil indicates with different colors.

- White — Idle. The normal state of the device.
- Yellow — Selected. You have selected the device.
- Green — Connected. The device is connected to your computer.

— Operations

- Single-click on the icon to select.
- Double-click on the icon to search for the services supported by the remote device.
- Right-click on the icon to display a pop-up menu of related operations (e.g., Refresh Devices, Pair Devices, Connect, etc.).

7.4.1.1.3 Bluetooth Service Buttons of Remote Device

Service buttons at the top of the Main Window represent a range of Bluetooth services potentially supported by Remote Devices.

PAN		DUN	
SPP		LAP	
FTP		SYNC	
OPP		HCRP	
HID		FAX	
BIP		AV	
Headset			

— Icon Meanings

There are 3 states for the service icons, indicated by different colors.

- White — Idle. The normal state.
- Yellow — Available. The Bluetooth service is available on the selected remote device.
- Green — Connected. The Bluetooth service is active in a connection with the remote device.

— Operations

- Hover your mouse over the service icon to display the name of the service.
- Single-click on the service icon to connect.
- Right-click on the service icon to display a pop-up menu of related operations.

7.4.1.2 Service Window

The Service Window displays the local Bluetooth services, (i.e., the Bluetooth services supported by BlueSoleil). Use the Service Window to start and stop services, as well as to configure service properties. To access the Service Window, click:

View | Service Window

Local Service List

The Local Service List displays all of the Bluetooth services supported by the local computer. Use this screen to start/stop services.

PAN		SPP	
OPP		FTP	
SYNC		LAP	
AV		BIP	
Headset AG			

— Icon Meanings

There are 3 states for the local Bluetooth services, indicated by different icon colors.

- White – Idle. The service has not been started.
- Yellow – Started. The local Bluetooth service has been started.
- Green – Connected. Some remote device has connected to the service.

— Operations

- Single-click on the icon to select the service.
- Double-click on the icon to Start/Stop a service.
- Right-click to display a pop-up menu of related operations.

7.4.1.3 Menus

BlueSoleil contains the following six menus:

- File Menu
- View Menu
- My Bluetooth Menu
- My Services Menu
- Tools Menu
- Help Menu

File Menu

Hide — Hide the BlueSoleil window. Connections can still run when the window is hidden.

Always on Top — Keep the BlueSoleil window always on top.

Exit — Exit BlueSoleil.

You can also exit BlueSoleil by right-clicking on the task tray icon at the bottom of your screen. In the pop-up menu, click Exit.

View Menu

Main Window — Show the BlueSoleil Main Window.

Service Window — Show the BlueSoleil Service Window.

Arrange Devices — Arrange remote devices by Device Name, Device Address, or Device Type

Refresh Devices — Refresh the list of remote devices detected by BlueSoleil.

Note: If you select Refresh Devices, the list of previously detected devices will not be cleared. To initiate a new device search that will first clear the list, press F5.

My Bluetooth Menu

Bluetooth Device Inquiry -— Search for other Bluetooth enabled devices in range.

Bluetooth Service Browsing — Browse for the services of the selected remote device.

Security — Configure the security settings of the local device (e.g., passkey requirements, data encryption, etc.).

Properties — Configure the properties of the local device (e.g., device name, accessibility, etc.).

My Services Menu

Start Service — Start the selected local Bluetooth service.

Stop Service — Stop the selected local Bluetooth service.

Status — View the status of the selected local Bluetooth service.

Properties — Configure the properties of the local Bluetooth services (e.g., automatic connections, shared file locations, etc.).

Tools Menu

My Shortcuts — Display dialog Bluetooth Shortcuts.

Connect: Connect the selected shortcut.

Delete: Delete the selected shortcut.

Find Device — Click to find a device, by either of two search criteria:

By Bluetooth Device Address:

Enter a Bluetooth device address, in standard format (xx:xx:xx:xx:xx:xx), and click on the Find button. The device with the specified address will appear highlighted in the Main Window.

By Name:

Check the By Name box, enter the Name of the device, and click on the Find button. The device with the specified name will appear highlighted in the Main Window.

Add New Device — Add a remote device by entering its Bluetooth device address.

Add Device From History — Add a remote device from the history list.

Add: Add the selected device.

Delete: Clear the selected device from the history list.

Configurations->Connect With — If desired, assign a remote device to automatically connect with a Bluetooth serial port whenever an application opens the specified port.

Assign: Assign a device to the selected port.

Remove: Remove the Auto-Connection device assignment for the selected port.

Configurations-> Unplug HID — Remove Human Interface Devices from BlueSoleil.

Unplug: Unplug the selected HID device.

When you first connect the HID device to your computer, BlueSoleil sets up the devices so that they will automatically reconnect in case the connection is ever broken. After you unplug an HID device, it will no longer automatically reconnect to your computer.

Bluetooth Device — Advanced hardware configuration, recommended for advanced users only. Please refer to 4.2 Hardware Configuration for more details.

Help Menu

Contents and Index — Access BlueSoleil Online Help.

About BlueSoleil — Information about your version of BlueSoleil.

7.4.2 Device Configurations

7.4.2.1 Hardware Configuration

BlueSoleil supports the following kinds of Bluetooth radio adapters: USB and CF card.

To access the hardware configuration screens, click

Tools | Bluetooth Device...

Bluetooth Device

Select the type of Bluetooth enabled device that you plan to use, either a USB adapter or a CompactFlash (CF) card.

Advanced Configuration

The Advanced Configuration page will be enabled only if you selected CF in the Bluetooth Device screen. Use the Advanced Configuration screen to configure detailed parameters including COM Port, Baud Rate, Byte Size, Parity, Stop Bits, and Flow Control.

7.4.2.2 Properties Configuration

To configure the properties of your local device, click:

My Bluetooth | Properties...

General

— Device Name

The local device's name, which will be shown to other Bluetooth enabled devices.

— Device Type

The device type of your local computer, (i.e., Desktop, Laptop or Server).

— Device Address

The address of the local device. Every Bluetooth enabled device has a unique device.

Accessibility

— Connecting Mode

- Connectable: Permits other Bluetooth enabled devices to connect with your computer.
- Non-Connectable: Prohibits other Bluetooth enabled devices from connecting with your computer.

— Discovery Mode

- General Discoverable: Permits other Bluetooth enabled devices to detect your computer.
- Limited Discoverable: Permits other Bluetooth enabled devices to detect your computer with Limited Inquiry.
- Non-Discoverable: Prohibits other Bluetooth enabled devices from detecting your computer.

— Bonding Mode (Pairing Mode)

- Accepts Bonding: Allow other Bluetooth enabled devices to pair with your computer. If the other device initiates a pairing procedure with your computer, each device must enter the same passkey before the they will be paired.
- Does Not Accept Bonding: Rejects pairing attempts initiated by other Bluetooth enabled devices.

Hardware

View information about your Bluetooth hardware.

- Manufacturer: The manufacturer of the local Bluetooth device.
- HCI Version: The HCI version of the local Bluetooth device.
- HCI Edition: The HCI edition of the local Bluetooth device.
- LMP Version: The LMP version of the local Bluetooth device.
- LMP Subversion: The LMP subversion of the local Bluetooth device.

7.4.3 Security Configuration

Use the Security Configuration screens to specify the security settings of your local device.

7.4.3.1 Pair / Un-pair Devices

Once a remote device has paired with your computer by exchanging passkeys, passkeys will no longer be required for further connections between your computer and the device.

7.4.3.1.1 How to pair with another device

— Automatically

If a passkey is required for connection, the devices will be paired automatically the first time they successfully exchange passkeys and connect. After a device has successfully paired with your computer, the remote device icon in the Main Window will have a red checkmark next to it.

— Manually

In the Main Window, right click on the device icon, and in the pop-up menu, select Pair Device. In the Enter Bluetooth Passkey screen, enter the same passkey that you enter on the remote device. After a device has successfully paired with your computer, the remote device icon will have a red checkmark next to it.

7.4.3.1.2 How to un-pair with another device

In the Main Window, right-click on the device icon, and in the pop-up menu, select Unpair. The red checkmark next to the device icon will disappear.

7.4.3.2 General Security

To access the security configuration screen, click:

My Bluetooth | Security...

7.4.3.2.1 Security Level

— Low

If checked, other devices will be able to access your device freely without entering a passkey.

However, if the remote device requires a passkey to connect, then both devices need to exchange passkeys.

— Medium

The medium level provides service level security. You can assign the appropriate level of access for each specific service. For more details, see 4.3.4 Local Services Security.

— High

If checked, passkeys must be exchanged for every incoming and outgoing connection, unless the two devices have already paired in the past.

7.4.3.2.2 Bluetooth Passkey

— Set Default Passkey

Use this setting to create a default passkey for all connections. This saves you the effort of manually creating a passkey whenever one is required.

7.4.3.2.3 Data Encryption

— Enable Data Encryption

If checked, the data transmitted will be encrypted.

7.4.3.3 Managing Device Pairings

To access the device security configuration screen, click **My Bluetooth | Security** and click on the Devices tab.

— Paired Devices

This screen lists devices which have already paired with the local device.

— Remove Pairing

Click to remove the pairing relationship between the selected device and the local device.

— Authorization

Click to select the local Bluetooth services that you wish to allow the selected paired device to use. A list of local services will appear. Select the services you wish to allow on the remote device, then click OK.

Note: The screen will only list the local services that require authentication. The local services that do not require authentication can be accessed freely.

The Authorization button is enabled only when the Security Level is set to Medium.

7.4.3.4 Local Services Security

To access the local services security configuration screen, click:

My Bluetooth | Security

and click on the Services tab. You can only configure security for local services when the Security Level is set to Medium. (Set the Security Level in the General Security screen.)

7.4.3.4.1 Local Services:

— Authentication

If checked, a passkey is required whenever a remote device attempts to connect with this service.

— Encryption

If checked, data transmitted between devices for this service will be encrypted.

— Authorization

Click to select the devices you wish to allow to use the selected service.

In the Service Authorization screen, enter the following settings:

— Trusted Devices

Select to trust devices listed in this screen to use the selected service on your device.

A device can freely access the service from your local device when trusted. Click Add/Remove to edit the device list.

— Trust all devices

Connection requests will be accepted from every device.

— Prompt user if the device is not trusted for this service

If a non-trusted device attempts to access the service, a dialog will appear to allow you to accept or reject the connection.

— Reject devices from using the service if not trusted for the service

If a non-trusted device attempts to access the service, the connection will be rejected automatically without informing the user.

Notes: If a device is trusted for a service, it may connect to this service on your local device without informing you.

Appendix A — EAP Types

AES	AES-CCMP is the encryption method defined with IEEE 802.11i and certified with WPA2. Stronger than RC4 (which is used with both WEP and TKIP), AES-CCMP is considered sufficient for FIPS 140-2. AES - Advanced Encryption Standard CCMP - Counter Mode CBC-MAC Protocol
Authentication	The process of verifying the identity of: • A station attempting to gain access to a network. • A network to which a station is trying to gain access. IEEE 802.1X, which is the authentication component of WPA and WPA2, performs mutual authentication through an Extensible Authentication Protocol (EAP) type. With mutual authentication, the network authenticates the station and the station authenticates the network.
Auth Type	Auth Type indicates the 802.11 authentication type used when associating to an access point. SCU authentication type parameters include: • Open - This two-step authentication type involves the station sending a request (usually a randomly generated key) to the access point. The access point sends an authentication response that contains a success or failure message. Once accepted, the key is only used for a short period of time; then a new key is generated and agreed upon. • Shared - With a shared authentication type, both the station and the access point have the same "shared" key or passphrase. • LEAP (Network-EAP) **Note:** See **http://www.cisco.com/en/US/products/hw/wireless/ps4570/products_configuration_example09186a00801bd035.shtml** for a Cisco explanation of 802.11 authentication using Open and Network-EAP. The Summit Client Utility refers to Network-EAP as LEAP. **Note:** Summit highly recommends the use of Open which is also the SCU default. This setting can be edited from the Profile window of SCU.
Bit Rate	Bitrate is the measurement of how much data is transmitted in a given amount of time from one location to another. It is generally measured in bits per second (bps), kilobits per second (Kbps), or megabits per second (Mbps).
CAM	CAM (Constantly Awake Mode) is a power save mode that keeps the radio powered up continuously to ensure there is minimal lag in response time. This power save setting consumes the most power but offers the highest throughput.
CKIP	CKIP (Cisco Key Integrity Protocol) and CMIC (Cisco Message Integrity Check) are Cisco-defined predecessors to WPA TKIP and are supported only on Cisco Wi-Fi infrastructure. An SCU profile setting of CKIP (not CKIP-EAP) means that the encryption keys are defined in SCU. An SCU profile setting of CKIP-EAP means that the encryption keys are derived dynamically from an EAP authentication. **Note:** If the SCU active profile has an encryption setting of CKIP or CKIP EAP, then the Summit radio associates or roams successfully to an access point that is configured with the following: • The SSID and other RF settings of the SCU active profile • The authentication method of the SCU active profile • Any of the following encryption settings: – WEP only (no CKIP or CMIC) – WEP with CKIP – WEP with CMIC – WEP with CKIP and CMIC **Note:** Summit recommends the use of TKIP or WPA2.

Client Name	For the SCU, the device name assigned to the Summit radio and the client device that uses it. **Note:** If CCX Features are set on the SCU Global settings page, then the client name is relayed and used for association.
Credentials	The Credentials button on the Profile window of SCU allows you to add or edit the authentication credentials for the selected EAP type. See **6.1.2.6 EAP Credentials** on p. 71 fopr more information.
EAP	See **6.1.2.6 EAP Credentials** on p. 71 for more information.
Fast	Fast is a power save mode that switches between PSP (Power Save Protocol) mode and CAM mode, depending on network traffic. For example, it switches to CAM when it is receiving a large number of packets and switches back to PSP after the packets have been retrieved. Fast is recommended when power consumption and throughput is a concern.
Encryption	Encryption involves scrambling transmitted data so that it can be read only by the intended receiver, which has the proper key to decrypt unscramble the encrypted data. In Summit Client Utility, the Encryption setting in a profile can refer not just to an encryption method but also to an authentication method and an encryption key management protocol. For more information, see "SCU Encryption Settings" Table.
Maximum	Maximum (Max PSP) is a power save mode where the access point buffers incoming messages for the radio. The radio occasionally 'wakes up' to determine if any buffered messages are waiting and then returns to sleep mode after it requests each message. This setting conserves the most power but also provides the lowest throughput. It is recommended for radios in which power consumption is most important (such as small battery-operated devices).
Power Savez	Indicates the radio's current power save setting. Power save mode allows you to set the radio to its optimum power-consumption setting. Maximizing battery life for full shift operation is an important consideration for vendors and users of hand-held data terminals and similar devices. Summit provides a number power save modes that can significantly reduce the radio's power consumption and maximize the battery life of the host device. Summit supports the three following power save modes: • CAM (Constantly Awake Mode) • Fast • Maximum When in power save mode, the radio "sleeps" most of the time and "wakes up" only when it has data that needs to be sent to the infrastructure (or at an interval determined between the station and the access point). When the radio is awake, the access point also delivers to the station any data that has been buffered during the radio's sleep period.
Radio Mode	Radio mode is an SCU Profile setting that indicates the use of 802.11a, 802.11g, 802.11b, and 802.11n frequencies and data rates when interacting with an access point, or the use of ad hoc mode to associate to a station radio instead of an access point. When SCU operates with a Summit 802.11g radio, an administrator can select from among the following radio mode values: • B rates only - 1, 2, 5.5, and 11 Mbps • G rates only - 6, 9, 12, 18, 24, 36, 48, and 54 Mbps • BG rates full - All B and G rates • BG Subset - 1, 2, 5.5, 6, 11, 24, 36, and 54 Mbps. This should only be used with Cisco APs running IOS in autonomous mode (without controllers). For Cisco APs that are tied to controllers and for non-Cisco APs, Summit recommends BG rates full. (cont'd)

Radio Mode (cont'd)	• Ad Hoc - When selected, the Summit radio uses ad hoc mode instead of infrastructure mode. In infrastructure mode, the radio associates to an AP. In ad hoc mode, the radio associates to another station radio that is in ad hoc mode and has the same SSID and, if configured, static WEP key. **Note:** The default is BG rates full. **Note:** See "802.11a/g Radio Mode with 802.11g Radio" for additional information. When SCU operates with a Summit 802.11a/g radio, an administrator can select from the following radio mode values: • B rates only - 1, 2, 5.5, and 11 Mbps • G rates only - 6, 9, 12, 18, 24, 36, 48, and 54 Mbps • BG rates full - All B and G rates • A rates only - 6, 9, 12, 18, 24, 36, 48, and 54 Mbps (same as G rates) • ABG rates full - All A rates and all B and G rates, with A rates (the 802.11a radio) preferred (see "Preferred Band for 802.11a/g Radio" for more information). • BGA rates full - All B and G rates and all A rates, with B and G rates (the .11g radio) preferred (see "Preferred Band for 802.11a/g Radio" for more information). • BG Subset - 1, 2, 5.5, 6, 11, 24, 36, and 54 Mbps. This should only be used with Cisco APs running IOS in autonomous mode (without controllers). For Cisco APs that are tied to controllers and for non-Cisco APs, Summit recommends BG rates full. • Ad hoc mode instead of infrastructure mode. In infrastructure mode, the radio associates to an AP. In ad hoc mode, the radio associates to another station radio that is in ad hoc mode and has the same SSID and, if configured, static WEP key. **Note:** The default is ABG rates full. **Note:** See "802.11a/g Radio Mode with 802.11g Radio" for additional information. ***Preferred Band for 802.11a/g Radio*** When the radio mode value is ABG rates full, the 5 GHz (A) band is preferred over the 2.4 GHz (BG) band. When the radio mode value is BGA rates full, the 2.4 GHz (BG) band is preferred over the 5 GHz (A) band. • Ad Hoc - When selected, the Summit radio uses When trying to associate to an access point, the radio considers access points in the preferred band. If the radio is able to associate to one of these access points, then the radio will not try to associate to an access point in the other band. The only time that the radio attempts to associate to an access point in the non-preferred band is when the radio is not associated and cannot associate in the preferred band. When roaming, the radio considers only access points in the current band (the band in which the radio is currently associated). The radio will consider an access point in the other band only if it loses association. ***802.11a/g Radio Mode with 802.11g Radio*** When an administrator tries to create or edit a profile, SCU determines which radio is operating in the device and populates the available radio mode values according to the radio type. Suppose a profile created for an 802.11a/g card is loaded on a device with an 802.11g card. If a radio mode value of A rates only, ABG rates full, or BGA rates full was set in the profile, then SCU displays a value of BG rates full. If the administrator does not save any changes to the profile, then SCU leaves the profile, including the radio mode, unchanged. If the administrator saves any changes to the profile, then SCU saves the radio mode value as BG rates full.
SSID	Service Set Identifier. Unique name of up to 32 characters that identifies a particular 802.11 WLAN. The SSID is attached to the header of packets that are sent over a wireless network.

Tx Power	In SCU, Tx Power displays on the Status window to indicate of the power of the radio, in milliwatts (mW). This value can be overwritten by the AP; the AP can dictate to the client what power to use.
WEP	WEP (Wired Equivalent Privacy) encrypts transmitted data using 64-bit or 128-bit encryption. WEP, which was defined with the original IEEE 802.11 standards, is not recommended because a WEP key can be "broken" in less than an hour using commonly available tools.
WPA/WPA2	WPA (Wi-Fi Protected Access) and WPA2 (Wi-Fi Protected Access 2) are security certifications defined by the Wi-Fi Alliance. To earn a WPA or WPA2 certification, a product must pass a set of tests that elements of the security specification have been implemented correctly. Since March 2006, WPA2 is mandatory for all new equipment that is certified by the Wi-Fi Alliance. Both WPA and WPA2 include three security elements: authentication, encryption, and encryption key management. WPA and WPA2 support the same authentication methods and similar key management methods. The primary difference between the two is in the area of encryption: WPA defines TKIP as the primary encryption method; WPA2 defines AES-CCMP as the primary encryption method. Both WPA and WPA2 include a Personal version and an Enterprise version. With WPA-Personal and WPA2-Personal, which SCU refers to as WPA-PSK and WPA2-PSK, authentication is done through a pre-shared key (PSK) or passphrase that is statically configured on every client device and infrastructure device. With WPA-Enterprise and WPA2-Enterprise, authentication is IEEE 802.1X, which uses an EAP type. WPA2-Enterprise is the equivalent of IEEE 802.11i, the ratified standard for Wi-Fi security.

Appendix B — Encryption Settings

In SCU, the Encryption setting in a profile can refer not just to an encryption method but also to an authentication method and an encryption key management protocol. The following table provides an explanation of SCU Encryption settings:

Profile Setting	Authentication	Encryption	Key Management
None	None	None	None
WEP	None	WEP	Static (in SCU)
WEP EAP	EAP Type	WEP	Dynamic (from EAP)
CKIP	None	WEP+CKIP+CMIC	Static (in SCU)
CKIP EAP	EAP Type	WEP+CKIP+CMIC	Dynamic (from EAP)
WPA-PSK	PSK/password (in SCU)	TKIP	WPA
WPA-TKIP	EAP Type	TKIP	WPA
WPA CCKM	EAP Type	TKIP	WPA+CCKM
WPA2-PSK	PSK/password (in SCU)	AES-CCMP	WPA2
WPA2 AES	EAP Type	AES-CCMP	WPA2
WPA2 CCKM	EAP Type	AES-CCMP	WPA2+CCKM

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