



Detailed Product Requirements

SCS-C5 Configuration Software

Index #: 206

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Common Software:	2.1	October 7 th 2009
MCA-C3 Controller:	1.5	January 23 rd 2008
MCA-C5 Controller:	2.6	October 26, 2009
MCA-C7 Controller:	1.4	January 3 rd 2008
CX Expander:	1.3	September 26 th 2007

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Revision Control Notes

Description	Date	Revision
• Remove RNETi and replace with C-Series	10/26/07	.2
• Updated Project Manager	10/26/07	.2
• New formatting of definitions with hyperlinks started	11/29/07	.3
• Update with new information and priority based on MCA-C5 project changes and pending viability of MCA-C3, MCA-C7 and CX	06/10/08	1.1
• Removed zone stereo/mono selection	6/16	1.1
• Removed software setting for Page Signal sensitivity now hardware setting only	9/19/08	1.2
• Updated document with official product names. SCS-C5 (C-Series Config Software), MCA-C3 (C1), MCA-C5 (C2), MCA-C7 (C3) and MDK-C5 (UNO-Multi)	9/19/08	1.2
• Revised "Preferences"	9/26/08	1.3
• Updated descriptive text for Power Management screens	9/29/08	1.3
• Updated Key Command Definition to reflect Play / Pause changes	11/18/08	1.4
• Changed CD to Download only as means for delivery	11/18/08	1.4
• Removed the requirement for an install manual	11/18/08	1.4
• Removed Undo & Redo from Edit menu	11/18/08	1.4
• Removed Print and Print Preview from File Menu	11/18/08	1.4
• Revised Tuner Preset details for clearing presets	11/18/08	1.4
• Auto-play is selected by default	11/24/08	1.5
• Added iBridge dock/bay to device type list	11/24/08	1.5
• Page Group box in zone setup is disabled when Page Source isn't selected	11/24/08	1.5
• IR description will not persist in the controller due to character length limitations	1/16/09	1.6
• Added Macro Test Warning – new section 4.4.3.27	1/16/09	1.7
• Updated Preferences (section 4.4.3.29) to include check box for enable or disable Macro Test Warning	1/16/09	1.7
• Revised Macro Test Warning to include 'continue'	1/20/09	1.8
• Nesting macros within another noted as enhancement consideration for future release	1/21/09	1.9
• Page Source selection disables zone access to source check box and zone / source command overrides found on zone more tab	2/23/09	2.0
• Added detail for Party Mode Participation and Slave Zone Max Volume	2/23/09	2.0

• Added Arcam DAB Tuner Support in Power Management, Command Editor, Source Setup, Setup Wizards, Source Templates	10/07/09	2.1
• Updated Program options for connection type	10/7/09	2.1
• Updated System Setup for RS232 COM port protocol selection	10/8/09	2.1
• Added IP Address text field in Program Options	10/9/09	2.2
• Revised Program Options screen language	10/26/09	2.3
• Revised Arcam protocol text on System Setup	10/26/09	2.3
• Revised Arcam DAB Tuner source setup page language for device type exclusion / usage	10/26/09	2.3
• Revised Tools content in the Toolbar (bug 13588)	11/19/09	2.4
• Added Firmware Update screen description with revised text relating to the Device Update application	11/19/09	2.4
• Updated screen shots that didn't display 'Firmware Update' in the file tree	11/18/09	2.4
• Added Device Update details	11/19/09	2.4
• Address Automated Setup Tools per bug 13552	11/19/09	2.4
• Source Setup Wizard conditions for device type note Arcam DAB Tuner can only be used for one source per system per bug #13553	11/19/09	2.4
• Update Channel Database for RNET Satellite Tuner conditions added per bug #13639	11/24/09	2.5
• Removed 'Generate Error Report' button on Preferences dialog box	3/18/10	2.6
• Removed Signal Sensing from Power Management for RNET Device Types (Page Source device type should have no power management tab)	3/18/10	2.6
• Program Options screen conditions related to matching controller type to project file type added	3/19/10	2.6
• Updated RIO protocol baud rates per bug #13836	5/11/10	2.7
• Updated Arcam Protocol conditions as per bug #13558	5/11/10	2.7
• General updates / revisions removing controller type from Controller screen, removed ZXP references, added MCA-C3 conditions where applicable, and screen layout corrections to actual product as per bug #14240	5/11/10	2.7
• Added Media Streamer Device Type Detail	5/12/10	2.7
• Added Media Streamer Internal Tuner Device Type Detail	5/12/10	2.7
•		

1 Executive Summary (G1)

1.1 Product Purpose

1.1.1 Overview

The SCS-C5 is what will be required to program and configure the settings for the new C-Series products (MCA-C3, MCA-C5, MCA-C7 and CX). While the initial product offering will be the MCA-C5, the ultimate functionality of this software will be developed to fit the requirements set forth within the C-Series Product Requirement Documents for the MCA-C3, MCA-C5, MCA-C7 and CX products as they are developed. Certain elements of the configuration software will be specified outside of the C-Series requirements as needed such as graphical layout, information architecture and back end operations and features.

1.1.2 Background of Project

This project is a direct dependency of the C-Series product development as a critical requirement for its salability and readiness for the market. It will be developed in conjunction with the C-Series Product Manager's awareness and approval.

This became an official project and was assigned the Project ID# 206 from Project Management on June 8th 2007.

As of April 2008 the decision was made to proceed with the MCA-C5 controller. In addition the MCA-C5 has been redefined to have a modification of its original feature set.

1.1.3 Project goals

The SCS-C5 will have an intuitive design to make it simple to use and understand. It will help promote the success of the C-Series products it supports through the design and add value to the Russound brand. The software will need to configure all C-Series Controller and Expander options as specified and / or determined by collaborative efforts within Product Management. The software will need to be capable of configuring Russound Removable Source Modules such as the AFM, XMM and SIM for tuner banks, presets etcetera as these may be supported by future C-Series controllers (originally a MCA-C5 feature).

The SCS-C5 will deliver on the following principles for proper user interface experience:

- Navigation
- Functionality
- Language
- Feedback
- Consistency
- Error handling
- Visual clarity

To have a complete working version of this developed, tested, revised and approved ready for public use in the same time frame as the C-Series (C-Series) product release.

1.2 Product Description

1.2.1 Product Name

The preliminary name for this product is: **SCS-C5**

The official product name will be proposed for approval by Gate 3 as a Marketing Services Group deliverable.

1.2.2 Primary Elements

The following list is prioritized by importance indicated on the right: 1 – Must Have / 5 – Not Required

• Support the MCA-C5 hardware platform for configuration	1
• Consideration to support all other C-Series hardware platforms for configuration as they are developed	1
• Support IR Learning through the hardware	1
• Support configuration of internal Removable Source Modules	1
• Support local file saving and retrieval for IR Database, System config files and source templates	
• Allow software updates for performance improvement or bug fixes	1
• Fit on a single CDROM media disk	1
• Support USB communication to the hardware for programming	1
• Configure connected hardware (i.e. CX) over RNET Link	1

1.2.3 Primary Features

The following features are prioritized by importance indicated on the right: 1 – Must Have / 5 – Not Required.

1.2.3.1 Common C-Series Controller configuration requirements

• Fixed or Variable Line-level output setting	1
• Zone Naming including Custom Names	1
• Zone Turn on Volume	1
• Zone Volume Trim also referred to as 'Maximum Zone Volume' level	1
• Slave Zone maximum volume level used in Party Mode	1
• Party Mode Participation	1
• All On Participation	1
• DND availability per zone	1
• Zone participation in Source Linking & Zone Linking Groups	1
• Zone Bass level adjustment	1
• Zone Treble level adjustment	1
• Zone Loudness setting	1
• Zone Balance adjustment	1
• Zone Stereo/Mono setting	1
• Zone Source Exclusion	1

- | | |
|--|---|
| • Macro configuration MCA-C3, MCA-C5, MCA-C7 ONLY (Presently only MCA-C5) | 1 |
|--|---|

1.2.3.2 MCA-C3 Controller specific requirements

• Source Naming including Custom Names	1
• Configure Source Power Management without signal sensing	1
• Configure Source Numeric IR with min and max values	1
• Source Trim level adjustment	1
• Source control configuration	1
• IR Learning	1
• Support linking of up to 5 additional controllers of the same model	1

1.2.3.3 MCA-C5 Controller specific requirements

• Including all Common and MCA-C3 requirements	1
• Configuration of optional Removable Source Module *FEATURE REMOVED	1
• Configure Source Power Management with Audio Signal Sensing	1
• Page Source assignment for source 8	1
• Page signal sensing adjustment	1
• Page Enable setting per zone	1
• Page Volume setting per zone	1

1.2.3.4 MCA-C7 Controller specific requirements

• Including all Common, MCA-C3 and MCA-C5 requirements (excluding *)	1
• Video Input Source Assignment	1
• Page Video Assignment	1
• Mute Trigger Video Assignment	1
• Support up to 5 additional MCA-C7 controllers (as determined by MCA-C7 product viability)	1

1.2.4 Scope

1. Simple – turnkey OEM product
2. Basic – some tooling required, hardware only
3. Average – tooling, hardware and some software required
4. **ADVANCED – TOOLING, HARDWARE, SOFTWARE AND IMPACT ON EXISTING PRODUCTS.**
5. Complex – designing new system architecture, ground breaking products.

1.2.5 Relation to Existing Products

1.2.5.1 User Interfaces

The SCS-C5 will not directly relate to existing products though the C-Series Controllers will support the MDK-C5 and TS2 User Interfaces.

1.2.6 Customers

The primary customers for the SCS-C5 are individuals who will be programming or configuring the hardware as there are no end user features in the software.

- Direct Dealers
- Distributors
- Integrators/Installers

1.2.7 Maintenance Users

1.2.7.1 Russound Software Engineering

Russound Software Engineering will be the primary party responsible for maintaining the software to keep it compatible with supported hardware systems and resolve software bugs that may occur in edge case scenarios that may have not been discovered through SQA testing.

1.2.7.2 Integrators / Installers

Integrators / Installers will be the primary point of discovery for compatibility issues or software bugs. As such, they will be responsible for either performing an update to the latest software version or to report the problem to Russound Customer Support.

1.3 Project Responsibilities

1.3.1 Product Manager

Responsible for defining Functional Spec based on end-user experience and market needs

Identify target market

- Identify primary end-users
- Define potential use-case scenarios

Communicate with Executive team to keep project synced to strategic business needs

Communicate with C-Series Product Manager to understand product needs as it relates to intended functionality

Communicate with software ware team to define software as it relates to intended functionality

Work with Project Manager to conduct all necessary updates regarding project to E-team

Anticipate risks to schedule; mitigate and solicit contingency plans

Preside at all SCS-C5 Gate presentations

1.3.1.1 Hardware Eng

There is no Hardware aspect to the SCS-C5

1.3.1.2 SQA

Primary responsibility is testing the product and verifying that it meets the publish spec and expected behaviors.

Formulate and carry out comprehensive test plan

Report all findings to Software team for correction/verification

1.3.2 Marketing Services

Responsible for assembling a proper launch/marketing campaign for the product

Coordinating with sales to provide materials for the C-Series product line

Complete Marketing Gate documentation for all gates

1.3.3 Executive Team

Responsible for making all Executive-level decisions concerning project

Review all proposals from C-Series team and render decisions

- Pursue all Executive-level activities that pertain to the project including supporting technologies and/or partnerships that enable realization of the project's goals

Communicate with C-Series team concerning any ongoing Executive-level developments that may affect the project

Communicate with C-Series team concerning any changes in company strategy that may warrant a change to the project (shifts in company focus, changes in the marketplace)

Communicate with Project Management on scheduling considerations

Sign off on all Gate documentation

1.3.4 Sales

Verify that proposed product has viability in the marketplace

Produce a sales forecast for the proposed product

- Determine target distribution

Coordinate with Education to produce C-Series educational program

Produce sales promotions for product

Complete Gate documentation for each gate

1.3.5 Technical Support

Create knowledge base for product

Operate and evaluate product

- Create initial list of answers to likely questions
- Keep running list of FAQs
- Create explanation scripts (if necessary) for FAQs that require long explanations.

1.3.6 Education

Coordinate timing of release of new C-Series currently in development

1.3.7 Project Management

Create and maintain project schedule as advised by project team

Drive the completion of activities, deliverables and action items to planned dates

Anticipate risks to schedule; mitigate and solicit contingency plans

Complete relevant Gate documentation for all gates

Conduct final assembly of all Gate documents

Work with Product Manager to conduct all necessary updates regarding project to E-team

Ensure appropriate communication from development team to Project Manager and from Project Manager to development team and e-Team

If required, escalate issues to next-level management for resolution

Schedule and facilitate regular cross-functional team meetings, providing meeting minutes and action item recording and follow-up

Preside at all SCS-C5 Gate presentations

1.3.8 Risks

Replacement for current products – must meet or beat current sales

Software Engineering Resources

2 Definitions & Descriptions (G1)

Item	Definition / Description	Detail	Value
Party Mode	Unification of zone operations controlled by a Master Keypad including source selection and volume level. Each zone has the ability to be configured to not participate in this mode. Zones participating in Zone Linking or Source Linking groups will follow the Master zone's configuration for Party Mode participation. Zones that participate in Party Mode but are not the Master are termed 'Slave' zones or keypads.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>Enable / Disable Selection</i> <i>Yes</i> <i>Enable</i>
Turn On Volume	The predetermined numeric volume setting that is established when a zone is turned on. Subject to Zone Volume Trim	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>0 to +100</i> <i>+/- 2</i> <i>Yes</i> <i>20</i>
Source Trim	The amount of signal attenuation applied to a given source. This is designed to permit sources with different signal strength to be audibly leveled equally with one another to prevent output level changes when selecting different sources.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>-16dB to 0dB</i> <i>+/- 1 dB</i> <i>Yes</i> <i>-3dB</i>
Zone Volume Trim	The amount of signal attenuation applied to a given zone. This would be used to prevent a zone from reaching uncomfortable, undesirable or distorted volume levels. This limits the output of the zone pre-amp to the amplifier to establish the maximum audio level for that zone at a given numeric value. This permits audible variance in relation to other zones that are at the same numeric volume level value.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>-16 to 0dB</i> <i>+/- 1dB</i> <i>Yes</i> <i>-3dB</i>
Custom Names	Installer defined names can be used to identify sources, zones or macros. Custom Names are specified in section 1.1.3.5 'Custom Names' of C-Series Common Software Specification to be limited to a total of 32 Custom Names with up to 12 Characters each including spaces.		
Zone Linked Group	<p>Zones that are assigned to participate in a Zone Linked group have a mirror behavior as one another. This includes source and volume settings though a relative difference in zone output level will be maintained according to the Zone Volume Trim setting. This means that all settings are conveyed through out each in that particular group as duplicate zones. This group is only configured through SCS-C5 and can't be changed by the end user. The parameters that these zones will have linked to one another are the following:</p> <ul style="list-style-type: none"> • Power • Source Selection • Volume Setting (Maintaining zone volume trim difference) • DND State • Party Mode participation level • Doorbell settings 	:	

Source Linked Group	<p>This feature links assigned zones to the source selection made by any in that particular linked group. Zones that are assigned to participate in a Source Linked group share only a limited range of parameters. As with a Zone Linked group, this group can only be configured or changed through the use of SCS-C5. The parameters that these zones will have linked to one another are the following:</p> <ul style="list-style-type: none"> • Source Selection • Party Mode Participation • Master Mode Participation 		
Do Not Disturb (DND)	<p>This setting determines the ability for a zone to have access to the DND feature. DND feature prevents a zone from receiving interruption from paging and prevents the source which is being used in that particular zone from being controlled by another zone until the source is deselected or the zone is turned off. A zone in DND mode will not be brought into a Party Mode operation</p>	<p><i>Range:</i> Enable / Disable <i>Increment:</i> Selection <i>Persistence:</i> Yes <i>Default:</i> Enable</p>	
Macro	<p>A sequential series of commands including delay time options. Macros are used for source control when a single user action is needed to execute a series of multiple commands. Up to 40 macros with 10 steps (commands) can be configured. Macros can have custom names assigned to them but the default names will be Macro 1 – Macro 40. When assigned a custom name, this will be what is used in other reference for Macro identification.</p>	<p><i>Range:</i> List <i>Increment:</i> Selection <i>Persistence:</i> Yes <i>Default:</i> First available</p>	
Slave Zone Maximum Volume Level	<p>A zone in Party Mode that is not the Master is termed a 'Slave' zone. This is the maximum volume level that a slave zone can reach when remotely controlled by a Master Keypad while in Party Mode.</p>	<p><i>Range:</i> 20% to 100% <i>Increment:</i> +/- 5% <i>Persistence:</i> Yes <i>Default:</i> 80%</p>	
Master Keypad	<p>The Master Keypad has control over Party Mode. Master mode is default for the zone that enables Party Mode but can be assumed by other keypads participating in Party Mode through a menu option. Only one keypad or zone can be the Master Keypad.</p>	<p><i>Range:</i> Enable / Disable <i>Increment:</i> Selection <i>Persistence:</i> Yes <i>Default:</i> Enable</p>	
Initial Group Participant	<p>The first zone which is assigned to a particular Controller Group (Zone or Source Linked) will impose its settings on all other zones assigned to the same group</p>		
Page Enable	<p>A Zone specific setting that enables or disables the zone from participating in paging functions or features</p>	<p><i>Range:</i> Enable/ Disable <i>Increment:</i> Selection <i>Persistence:</i> Yes <i>Default:</i> Enable</p>	
Page Volume	<p>This value sets the audio output level for paging functions. It is subject to Zone Volume Trim. This is independent of Zone Turn On Volume setting.</p>	<p><i>Range:</i> 0 to +100 <i>Increment:</i> +/- 2 <i>Persistence:</i> Yes <i>Default:</i> 20</p>	
Page Video Assignment	<p>This establishes the page event to select Video Input D in this zone (MCA-C7 Controller Only)</p>	<p><i>Range:</i> Yes, No <i>Increment:</i> Selection <i>Persistence:</i> Yes <i>Default:</i> No</p>	
Mute Trigger	<p>This zone specific parameter determines if a mute event</p>	<p><i>Range:</i> Yes, No</p>	

Assignment	will cause this zone to correspondingly select Video Input D (MCA-C7 Controller Only)	<i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>Selection</i> Yes No
Zone Source Exclusion	This feature will permit zones to individually have the ability to select which sources they will have access to. This is a group of check boxes. The max number is based on the controller (MCA-C3:6, MCA-C5:8, MCA-C7:8). This is subject to override by a Favorite.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>Source 1 to (see detail)</i> <i>Individual Selection</i> Yes All Selected
All On	Turns on every zone which has All On enabled on a controller or linked controllers. Each subject to individual Turn On Volume . Zones already on will remain on.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>Enable / Disable</i> <i>Selection</i> Yes Enable
Zone	A dedicated part of a multiroom system that has its own input and output controls and configurable settings. A room is typically referred to as a zone though this pertains specifically to the multiroom system		
Controller Group	<p>A group of zones restricted to a single multiroom controller which participate uniformly in some level of behavior with one another sharing certain levels of functionality. There are Zone Linked and Source Linked Groups. The ideal / target zones to be considered for inclusion in a group will typically be located within the same listening area or a shared living space in the home.</p> <p>Any controller (MCA-C3, MCA-C5 and MCA-C7) or zone expander (CX) can support up to two (2) groups. Groups are exclusive to the controller and can't bridge controllers. Meaning that the zones connected to that controller can only participate in up to two groups total and zones on another controller are able to participate in two different groups.</p> <p>Groups can have custom names and can be either a Zone Linked group or a Source Linked group. Two groups of the same type can exist within the same controller. However, a zone can't participate in two groups of the same type as this would bind the groups as one. A zone can participate in two groups that are different. Each group type has its specific behavior detailed below.</p> <p>The first zone that is assigned to belong to a group will be the Initial Group Participant. As such, it's settings for other behavior will be imposed on any other zone(s) that are assigned to the same group.</p>		
All Off	Turns off every zone which has All Off enabled on a controller or linked controllers. Subject to DND being enabled in a zone which will prevent an All Off command from affecting that zone.		
Page Source	On the MCA-C5 and MCA-C7 Controllers only, source #8 can be repurposed as a Page Source through an installer only selection via a check box on the source #8 setup page. When selected as a page source, an option to adjust the signal sensing for triggering is enabled for adjustment and is otherwise hidden or disabled.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>Yes / No</i> <i>Selection</i> Yes No
Video Source Assignment	The MCA-C7 product has 4 video inputs referred to as A, B, C and D. These can be assigned to be associated	<i>Range:</i> <i>Increment:</i>	<i>None, A, B, C, D</i> <i>Selection</i>

	with 4 of the 8 audio source inputs meaning that when an audio source is selected an assigned video source can be displayed as well. The location for assignment of these sources to audio sources will live on each of the source setup pages. Multiple audio sources can have the same video input assigned to them such as the single composite video output of an SMS3 being assigned to the three audio inputs which the three SMS3 audio streams are connected to.	<i>Persistence:</i> <i>Default:</i>	Yes None
Group Name	The name which is assigned to a Controller Group which is displayed in the configuration software and potentially for display on GUI devices. It is a custom name.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	Custom Name None Yes Group Type
Group Type	This defines the Controller Group so as to determine the level of behavior which is shared between zones participating in this group	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	Zone Linked / Source Linked Selection Yes #1 Zone Linked, #2 Source Linked
Zone Names	List of predefined names in section 1.1.2.12 'Zone Names' of C-Series Common Software Specification including Custom Names . Zone names will appear in the file tree and in printed reports. They may also appear in future GUI devices	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	Zone Name List or Custom List List Yes Associated Zone #
Group Participation	Selection determines if a zone will participate in a group. The first zone to participate in a group is the Initial Group Participant and will set values for other zones that enter the group. A single zone can participate in two different type groups but can't participate in two groups of the same type as that would conjoin the groups into one.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	Yes / No Selection Yes No
Bass	Adjusts the bass level of the zone.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	-10 to +10 with center 0 = 'Flat' +/- 1 Yes Flat
Treble	Adjusts the treble level of the zone	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	-10 to +10 with center 0 = 'Flat' +/- 1 Yes Flat
Balance	Adjusts the left right pan bias for the two audio channels of a zone	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	20 steps, L10, Center, R10 +/- 1 Yes Center
Loudness	Enables or disables an audio equalization setting in the preamp to emphasize bass and treble levels at lower volumes. Level of EQ dynamically reduces with increased volume to prevent distorted audio at high levels	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	On / Off Selection Yes Off
Stereo/Mono	Selection determines if the zones two audio channels will play information as two discrete channels or as a two channel monaural output	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	Stereo / Mono Selection Yes Stereo
Fixed / Variable Line	Selection determines if the zones preamp output gain will be set at a fixed level or variably controlled with the	<i>Range:</i>	Fixed / Variable

Output	zone volume adjustment	<i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>Selection</i> Yes Variable																														
Source	A device that provides audio and or video to the multiroom system for distribution and control to and from zones																																
Source Names	<i>This name labels the source for display in the file tree and on U.I.s of the system. The Source Name List consists of predefined names in section 1.1.3.3 ‘Source Names’ of C-Series Common Software Specification and are to include a Custom Naming option.</i>	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	List Selection Yes Source # (being configured)																														
Device Type	<p>The Device Type selection determines the type of source that is to be configured. As such it filters the Manufacturer in the IR library for non RNET Device Types. If the source is an RNET Device Type, Manufacturer selection is bypassed and the source control is based on the specific RNET source type selected. The following Device Type List consists of currently known / used Device Types and controller support. Note that the ‘Internal’ RNET sources are supported only by the MCA-C5 controller’s source 1 input and so visibility of these will be limited to that instance. When an “Internal” source is selected for configuration, the external RCA audio inputs will be disabled and the source audio will originate from the internal source module. MCA-C5 and MCA-C7 controllers support paging through source #8 input. Selection of the ‘Paging Source’ Device type is limited to these controllers and to source 8 setup pages. Selection will repurpose this source input for paging and the Source Setup pages will be specific for that purpose.</p> <p>Selection of the Arcam DAB Tuner can only be made for one source as it consumes the RS232 COM port and only one can be used on a system. Once the selection of Arcam DAB Tuner is made, it will become unavailable for selection in other source configuration pages and the source setup wizards. It will be grayed out with indication of what source it is configured for.</p> <table><tr><th>Device Type</th><th>Controller/Source</th></tr><tr><td>Unassigned</td><td>All</td></tr><tr><td>Paging Source</td><td>MCA-C5 & MCA-C7 Source 8 Only</td></tr><tr><td>Amp</td><td>All</td></tr><tr><td>TV</td><td>All</td></tr><tr><td>Cable</td><td>All</td></tr><tr><td>Video Accessory</td><td>All</td></tr><tr><td>Satellite</td><td>All</td></tr><tr><td>VCR</td><td>All</td></tr><tr><td>Laser Disc</td><td>All</td></tr><tr><td>DVD</td><td>All</td></tr><tr><td>Tuner / Amplifier</td><td>All</td></tr><tr><td>Misc. Audio</td><td>All</td></tr><tr><td>CD</td><td>All</td></tr><tr><td>Home Control</td><td>All</td></tr></table>	Device Type	Controller/Source	Unassigned	All	Paging Source	MCA-C5 & MCA-C7 Source 8 Only	Amp	All	TV	All	Cable	All	Video Accessory	All	Satellite	All	VCR	All	Laser Disc	All	DVD	All	Tuner / Amplifier	All	Misc. Audio	All	CD	All	Home Control	All	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	Device Type List Selection Yes Based on source being configured – Factory Settings in RNET Device Types will be the default for the associated source number
Device Type	Controller/Source																																
Unassigned	All																																
Paging Source	MCA-C5 & MCA-C7 Source 8 Only																																
Amp	All																																
TV	All																																
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Home Control	All																																

	<table><tr><td>5 Disc CD Changer</td><td>All</td></tr><tr><td>6 Disc CD Changer</td><td>All</td></tr><tr><td>CD Changer</td><td>All</td></tr><tr><td>DVD Changer</td><td>All</td></tr><tr><td>RNET AM/FM Tuner (Internal)</td><td>MCA-C5 Srce 1 Only</td></tr><tr><td>RNET XM Tuner (Internal)</td><td>MCA-C5 Srce 1 Only</td></tr><tr><td>RNET Sirius Tuner (Internal)</td><td>MCA-C5 Srce 1 Only</td></tr><tr><td>RNET AM/FM Tuner (External)</td><td>All</td></tr><tr><td>RNET XM Tuner (External)</td><td>All</td></tr><tr><td>RNET Sirius Tuner (External)</td><td>All</td></tr><tr><td>RNET SMS3</td><td>All</td></tr><tr><td>RNET iBridge Dock</td><td>All</td></tr><tr><td>RNET iBridge Bay</td><td>All</td></tr><tr><td>Arcam DAB Tuner</td><td>All—one source only</td></tr><tr><td>Russound Media Streamer</td><td>E&C-Series - Any 4 sources</td></tr></table>	5 Disc CD Changer	All	6 Disc CD Changer	All	CD Changer	All	DVD Changer	All	RNET AM/FM Tuner (Internal)	MCA-C5 Srce 1 Only	RNET XM Tuner (Internal)	MCA-C5 Srce 1 Only	RNET Sirius Tuner (Internal)	MCA-C5 Srce 1 Only	RNET AM/FM Tuner (External)	All	RNET XM Tuner (External)	All	RNET Sirius Tuner (External)	All	RNET SMS3	All	RNET iBridge Dock	All	RNET iBridge Bay	All	Arcam DAB Tuner	All—one source only	Russound Media Streamer	E&C-Series - Any 4 sources		
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Arcam DAB Tuner	All—one source only																																
Russound Media Streamer	E&C-Series - Any 4 sources																																
Manufacturer	<p>This is a list of supported brands for IR control. If the selected source Device Type is not an RNET source, the option to select a Manufacturer will be available. This selection filters the options in the IR library to the next level of granularity where the Device Codes presented will only pertain to the selected Device Type and Manufacturer. If the Device Type selected is an RNET source, 'Russound' will be hard-set as the Manufacturer but is otherwise not an available user selection. The Manufacturer list of supported brands is specified by the IR library provider.</p>	<p><i>Range:</i> IR Library List <i>Increment:</i> Selection <i>Persistence:</i> Yes <i>Default:</i> First available per Device Type Selected</p>																															
Device Code	<p>The Device Code is the numeric value of the preconfigured IR key code set provided by the IR Library. This is the final selection in determining what IR codes will be used for source control of non-RNET Device Types. IR Device Codes do not apply to RNET Device Type selections and as such this option will be disabled or hidden upon selection of an RNET Device Type.</p>	<p><i>Range:</i> Varied based on Manufacturer <i>Increment:</i> Selection <i>Persistence:</i> Yes <i>Default:</i> First available</p>																															
Keycode	<p>The Keycodes are labeled placeholders for non-RNET source control IR commands which, has been established by the supplier of the IR library which is used. These are assigned to specific key press events depending on the Device Type of the non-RNET source. They can be manually assigned by the installer through the Command Editor for the source control and new IR data can be learned into each location for each non-RNET source. Currently the list of known Keycodes are as follows</p> <table><tr><td>Unassigned</td><td>Menu Down</td><td>Close</td></tr><tr><td>1</td><td>Menu Left</td><td>Open</td></tr><tr><td>2</td><td>Menu Right</td><td>Stop 2</td></tr><tr><td>3</td><td>Select</td><td>AM FM</td></tr><tr><td>4</td><td>Exit</td><td>Cue</td></tr><tr><td>5</td><td>Display</td><td>Disc Up</td></tr></table>	Unassigned	Menu Down	Close	1	Menu Left	Open	2	Menu Right	Stop 2	3	Select	AM FM	4	Exit	Cue	5	Display	Disc Up	<p><i>Range:</i> Keycode List <i>Increment:</i> Selection <i>Persistence:</i> Yes <i>Default:</i> First available</p>													
Unassigned	Menu Down	Close																															
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	<table><tr><td>6</td><td>Guide</td><td>Disc Down</td></tr><tr><td>7</td><td>Page Up</td><td>Info</td></tr><tr><td>8</td><td>Page Down</td><td>Close</td></tr><tr><td>9</td><td>Disc</td><td>External Src</td></tr><tr><td>0</td><td>Plus 10</td><td>Live/Intro</td></tr><tr><td>Volume Up</td><td>Open Close</td><td>Setup Menu</td></tr><tr><td>Volume Down</td><td>Random</td><td>Back</td></tr><tr><td>Mute</td><td>Track Fwd</td><td>Fav Channel</td></tr><tr><td>Chan Up</td><td>Track Rev</td><td>Display Fmt</td></tr><tr><td>Chan Down</td><td>Sur On Off</td><td>SAP</td></tr><tr><td>Power</td><td>Sur Mode</td><td>Slow</td></tr><tr><td>Enter</td><td>Sur Up</td><td>PIP On</td></tr><tr><td>Prev Chan</td><td>Sur Down</td><td>PIP Off</td></tr><tr><td>TV Video</td><td>PIP</td><td>PIP Freeze</td></tr><tr><td>TV VCR</td><td>PIP Move</td><td>PIP Input</td></tr><tr><td>A B</td><td>PIP Swap</td><td>PIP Chan Up</td></tr><tr><td>TV DVD</td><td>Program</td><td>PIP Chan Dn</td></tr><tr><td>TV LD</td><td>Sleep</td><td>Input 1</td></tr><tr><td>Input</td><td>On</td><td>Input 2</td></tr><tr><td>TV DSS</td><td>Off</td><td>Input 3</td></tr><tr><td>Play</td><td>11</td><td>Input 4</td></tr><tr><td>Stop</td><td>12</td><td>Input 5</td></tr><tr><td>Search Fwd</td><td>13</td><td>Input 6</td></tr><tr><td>Search Rev</td><td>14</td><td>Input 7</td></tr><tr><td>Pause</td><td>15</td><td>Input 8</td></tr><tr><td>Record</td><td>16</td><td>Input 9</td></tr><tr><td>Menu</td><td>Bright</td><td>Input 10</td></tr><tr><td>Menu Up</td><td>Dim</td><td>Sleep</td></tr></table>	6	Guide	Disc Down	7	Page Up	Info	8	Page Down	Close	9	Disc	External Src	0	Plus 10	Live/Intro	Volume Up	Open Close	Setup Menu	Volume Down	Random	Back	Mute	Track Fwd	Fav Channel	Chan Up	Track Rev	Display Fmt	Chan Down	Sur On Off	SAP	Power	Sur Mode	Slow	Enter	Sur Up	PIP On	Prev Chan	Sur Down	PIP Off	TV Video	PIP	PIP Freeze	TV VCR	PIP Move	PIP Input	A B	PIP Swap	PIP Chan Up	TV DVD	Program	PIP Chan Dn	TV LD	Sleep	Input 1	Input	On	Input 2	TV DSS	Off	Input 3	Play	11	Input 4	Stop	12	Input 5	Search Fwd	13	Input 6	Search Rev	14	Input 7	Pause	15	Input 8	Record	16	Input 9	Menu	Bright	Input 10	Menu Up	Dim	Sleep		
6	Guide	Disc Down																																																																																					
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TV LD	Sleep	Input 1																																																																																					
Input	On	Input 2																																																																																					
TV DSS	Off	Input 3																																																																																					
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Command Button	A command button is an object or a screen element that initiates an action through its selection. It may be hidden, disabled (grayed out), enabled and can be the default selection when the Enter Key is pressed. Formatting for all Command Button use will be as specified here unless specified differently in context. Bold, Italicized or other text detail will be as specified here unless it is specified differently in context. Command Buttons do not set values in this application and therefore do not have persistence as would a check box or combo box selection.	Font Type: Font Size: Font Color: Button Size:	Arial 10 Point Bold Black To fit text																																																																																				
Check Box	A check box allows selection of a parameter which can determine a course of action upon selection of a command button.	Font Type: Font Size: Font Color: Size:	Arial 8 Point Black To fit text																																																																																				
Combo Box	A combo box is an expandable list box that presents a list of multiple options for selection. List contents are predetermined though additional entry may be allowed if specified. Contents of a combo box can be entirely exposed with a drop down button or scrolled through as a single line display via spin button control.	Font Type: Font Size: Font Color: Size:	Arial 8 Point Black To fit text or as specified																																																																																				
Text Box	A text box is a single line entry field that permits entry of text as is specified.	Font Type: Font Size:	Arial 8 Point																																																																																				

		<i>Font Color:</i>	<i>Black</i>
		<i>Size:</i>	<i>To fit text or as specified</i>
Radio Button	A radio button is a selectable object similar to a check box in that it allows selection of a parameter which can determine a course of action upon selection of a command button.	<i>Font Type:</i> <i>Font Size:</i> <i>Font Color:</i> <i>Size:</i>	<i>Arial</i> <i>8 Point</i> <i>Black</i> <i>To fit text or as specified</i>
Window Button	A Window Button is that which controls the window you are working in. The most familiar examples of these are Minimize, Maximize and Close. These are represented with standard icons in the top right corner of the active window.		
Windows Form	A Windows Form is a standard software GUI element which those in this application have a blue border, white title text, window buttons, gray colored body background and objects in the body. The size will vary based on content and the objects will vary based on application.	<i>Font Type:</i> <i>Font Size:</i> <i>Font Color:</i> <i>Window Buttons:</i>	<i>Arial</i> <i>12 Point bold</i> <i>White</i> <i>As specified</i>
Slider Control	Either horizontal or vertical oriented, a slider control allows installers to adjust a value through a GUI that give a visual association of value based on position. It has indication for range, limit and current value	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	<i>As specified</i> <i>Variable selection</i> <i>Yes</i> <i>As specified</i>
Application GUI page	This contains a Title Bar at the top, a menu bar under that at the top of the page, a File Tree on the left, the Page Main Body on the right and Window Buttons on the top right corner in the Title Bar.		
File Tree	This is a standard hierarchal tree view of folders and items as they relate and pertain to the applications configurable option organization. This displays relevant information and is dynamically populated based on configurable settings and also is used for navigation to other application GUI pages		
GUI Page Main Body	Contains the items for configuration of a specific area of relevance or aspect of the system as it is organized such as controllers, zones or other application options		
Group Box	This is an outlined area with a label that contains elements and / or objects that typically correlate to one another in a common purpose	<i>Font Type:</i> <i>Font Size:</i> <i>Font Color:</i>	<i>Arial</i> <i>10 Point Bold</i> <i>Blue</i>
Sunken Panel	This is an element used to call attention to a group of items or elements without placing them in a group box. It is a 'panel' that is inset (sunken) to give a perception of depth. Panels are also offered in a raised version		
Page Label	In this software, Application GUI Pages have a Page Label that informs the user what section they are on. This directly correlates with the associated File Tree object that links navigation to this page. Page Labels are text formatted as specified here and centered within a Sunken Panel . Placement of the Page Label is in the top left corner of the GUI Page Main Body section.	<i>Font Type:</i> <i>Font Size:</i> <i>Font Color:</i>	<i>Arial</i> <i>18 Point Bold</i> <i>Black</i>
Text Field	An area that displays text that is not directly configurable. The text may be dynamically populated from another source such as a zone name in the zone summary page	<i>Font Type:</i> <i>Font Size:</i> <i>Font Color:</i>	<i>Arial</i> <i>12 Point or As specified</i> <i>Black or as specified</i>
Page Tab	This denotes a second layer page with additional detail. Selection of the Page Tab exposes the corresponding	<i>Font Type:</i> <i>Font Size:</i>	<i>Arial</i> <i>10 Point or As specified</i>

	page. An example of this can be found on the Zone Setup Page	Font Color:	Black or as specified																																				
Key Command List	<p>This list contains Key Commands which can be installer configured to execute desired IR commands or macros upon selection. Key Commands may be configured in two locations. Within a source setup page will provide the desired action to be executed by all zones with access to this source. In addition, Key Commands can be configured under the Zone Setup pages 'More'. Configurations made in this area override any made in the Source Setup page and are executed specifically by the respective zone.</p> <table><tr><th>Key Command</th><th>MDK-C5 Action</th></tr><tr><td>Source Select Press</td><td>Source Select Press</td></tr><tr><td>OK Press</td><td>OK Press</td></tr><tr><td>OK Hold</td><td>OK Hold</td></tr><tr><td>Play Press</td><td>Play/Pause Hold</td></tr><tr><td>Play Hold</td><td>N/A</td></tr><tr><td>Stop Press</td><td>N/A</td></tr><tr><td>Stop Hold</td><td>N/A</td></tr><tr><td>Pause Press</td><td>Play/Pause Press</td></tr><tr><td>Pause Hold</td><td>N/A</td></tr><tr><td>Previous Press</td><td>Previous Press</td></tr><tr><td>Previous Hold</td><td>Previous Hold</td></tr><tr><td>Next Press</td><td>Next Press</td></tr><tr><td>Next Hold</td><td>Next Hold</td></tr><tr><td>Plus Press</td><td>Plus Press</td></tr><tr><td>Plus Hold</td><td>Plus Hold</td></tr><tr><td>Minus Press</td><td>Minus Press</td></tr><tr><td>Minus Hold</td><td>Minus Hold</td></tr></table>	Key Command	MDK-C5 Action	Source Select Press	Source Select Press	OK Press	OK Press	OK Hold	OK Hold	Play Press	Play/Pause Hold	Play Hold	N/A	Stop Press	N/A	Stop Hold	N/A	Pause Press	Play/Pause Press	Pause Hold	N/A	Previous Press	Previous Press	Previous Hold	Previous Hold	Next Press	Next Press	Next Hold	Next Hold	Plus Press	Plus Press	Plus Hold	Plus Hold	Minus Press	Minus Press	Minus Hold	Minus Hold	Range: Increment: Persistence: Default:	Varied based on Manufacturer Selection Yes First available
Key Command	MDK-C5 Action																																						
Source Select Press	Source Select Press																																						
OK Press	OK Press																																						
OK Hold	OK Hold																																						
Play Press	Play/Pause Hold																																						
Play Hold	N/A																																						
Stop Press	N/A																																						
Stop Hold	N/A																																						
Pause Press	Play/Pause Press																																						
Pause Hold	N/A																																						
Previous Press	Previous Press																																						
Previous Hold	Previous Hold																																						
Next Press	Next Press																																						
Next Hold	Next Hold																																						
Plus Press	Plus Press																																						
Plus Hold	Plus Hold																																						
Minus Press	Minus Press																																						
Minus Hold	Minus Hold																																						
Command Editor Dialog Box	This is actually a series of dialog boxes that permit the selection of a Command Type and subsequent keycode or macro that is to be used when editing a source control command for global or zone specific use																																						
List Box	Presents a list of multiple options similar to a Combo Box though this is expanded to a predetermined size and may contain a scroll bar if the list is larger than what can fit into the given size of the List Box.																																						
Brand / Manufacturer	This is the categorical search filter for the IR Library of source control commands. This list is comprised of various manufacturer and brand names as they apply to the contents of the IR library. This list is developed and maintained by the supplier of the IR library as determined through Hardware Engineering and Purchasing selection. It is found in the Source Setup Page .	Range: Increment: Persistence: Default:	Varied based on Manufacturer Selection Yes First available																																				
Source Setup Wizard	This is a series of formed dialog boxes that prompt the installer through the configuration of sources.																																						
Source Template File	This is a file that saves all configured source information for future retrieval and assignment for other sources. The file type extension is up to Russound Software Engineering though should be compatible with SCS-E5																																						

	configuration software source templates (*.est) for enhanced use of these resources.		
Table	A cellular listing with rows and columns.		
Power Management	Power Management permits sources to be turned on and off as needed for system use. For Legacy or IR controlled sources this is done through issuing IR commands to the source. As some of these types of sources use power commands that toggle the state of the equipment on and off, it is necessary to verify that the source is actually on and not off as an end users interaction with the source power directly would get the state out of sync. To address this concern, audio signal sensing is employed which will, after a predetermined time frame, 'listen' to the audio channel for a signal. If present, the source is obviously on. To obtain the audio signal it is necessary to instruct the source through IR commands to play a CD or tune to a known channel where audio is present. With RNET source types, power management is automatic and 100% accurate. Arcam DAB Tuner device type power management is accomplished through sending serial data commands for the Power ON and Power OFF commands through the repurposed DB9 COM port on the rear of the controller.		
Numeric IR	Numeric IR configures a minimum and maximum range for Numeric value scrolling. This may be used for a CD changer disc selection or a Cable box range of music channels		
IR Learning	The C-Series controllers have the ability to capture IR commands transmitted from an IR remote control and store them under a Keycode assignment. This is beneficial as not all source IR commands are available from the internal IR Library.		
Removable Source Module	A source (commonly a tuner) that can be installed or removed by qualified personnel in the field. This provides an easy solution to inventory with the benefits of an upgrade path for products in the field.		
Audio Signal Sensing	Used in Power Management to determine the power state of a source		
Verbal Prompt Volume	The Learn IR procedure provides a verbal prompt that will instruct the installer as to what Keycode they are learning IR data for. This prompt has an adjustable level that can be adjusted.	<i>Range:</i> <i>Increment:</i> <i>Persistence:</i> <i>Default:</i>	10 Steps: 1 "Off" to 10 "Max" +/- 1 step Yes 3
Auto Play	Auto Play applies the Play Keycode to the Source Select Key Command so that a play command is issued when the source is selected. Discrete Play command is the recommended use as a command that toggles the play pause state of the source will do so in this application which would produce undesirable results as a source is selected from more than one location. This is configured in page 5 of the Source Setup Wizard .		
Sub-Zone	Sub-zones are independent listening areas that are subservient to a Zone. In that they will always be selected to the same source as the primary Zone is selected to though they may have independent volume,		

	power, and tone levels. The MCA-C7 Controller is the only C-Series controller that supports ABUS® sub-zones.		
Controller Type	The type of controller will determine the supported features such as number of zones		
Arcam T32 DAB Tuner	Arcam is a brand and the DAB Tuner is for Digital Audio Broadcast in Europe. The UK is transitioning from analog broadcast to digital and the DAB tuner from Arcam is a viable solution for them which can be incorporated with the MCA-C5 through RS232 commands for control and data. It will be listed as a separate Device Type .		
Device Update	The Device Update is a separate application that is used to perform firmware updates to the MCA-C5 / MDK-C5 keypads. This is bundled with SCS-C5 and is launched from the Tools section of the SCS-C5 toolbar.		
Complete System Backup	This feature lives in the Tools section of the SCS-C5 toolbar. It performs a complete system backup and opens a save as dialog box to save a file for future use. This saves all installer and user configurable settings.		
Complete System Restore	This feature lives in the Tools section of the SCS-C5 toolbar. This will restore the system to the settings contained in a system backup file as noted in the Complete System Backup definition.		
Factory Init	This feature lives in the Tools section of the SCS-C5 toolbar. This will restore the system with the factory settings. Essentially initializing the controller back to a clean state.		
Check for Updates Now	This will require a valid internet connection so that SCS-C5 can check with a Russound database for any software updates.		
Firmware Updates	This page will permit the installer to check for new firmware and save any firmware files to their PC for future use		

3 Project Constraints (G2)

3.1 Implementation Constraints

3.1.1 Host system specification

The SCS-C5 is completely dependent upon a clear and concise specification for all host systems that it is supposed to configure. If features or intentions are not understood then there is a risk that the configuration software will not meet expectations.

3.1.2 Host system hardware

The SCS-C5 is completely dependent upon the completion of hardware for it to be tested for proper operation.

3.2 Interoperability Constraints

3.2.1 Russound Product

This Product must ultimately work with the C-Series controllers and zone expander products as they are developed. It must be able to program additionally connected hardware over the RNET Link such as when two controllers or an expander are used.

3.2.2 Computer OS

The SCS-C5 must be capable of operating on PCs which run the following operating system software.

Windows XP (Home and Professional)

Vista

The SCS-C5 will not be required to operate on a computer running an Apple Computer Operating System.

3.3 Installation Constraints

Installation of the software will be through a CDROM drive on the PC or other means of importing the files onto the PC such as a network drive or portable flash media.

3.4 Off-the-Shelf Constraints

N/A

3.5 Schedule Constraints

This product must coincide with the release of the new C-Series products.

3.6 Budget Constraints

There are no established budget constraints on this project though the schedule constraints would be the highest priority.

3.7 Relevant Facts

The SCS-C5 will be the 5th configuration software package to be produced by Russound.

- SCS-E5
- PC Power Tool
- SaphIR EZPro
- PC Power Tool ST

Considerations for future products of this type should be based on a common platform that each type would be an upgrade module for if there are no restrictions on availability, resources and budget. This would eliminate customers from having different types of software for configuration of the same brand of product.

This software package will need to configure various features for various host products in the C-Series product line. As such, the requirements for selection and filtration of host systems and their features will increase the complexity and demands on this project.

3.8 Assumptions

- Any assumptions for the requirements for this software application have been and or will be addressed with the Product Manager for the C-Series controllers which this specifically is being developed for.
- Resources will be sufficiently available for software development to coincide with the completion and release of the C-Series products
- Specification changes or revisions will be at a minimum for the C-Series products and any such will be specifically related to increased definition of the features which have currently been specified.
- Changes to the specification documents for the C-Series products will have a direct impact on the requirements for maintaining this document in both time and resources.
- Requirement questions for the C-Series products will be answered or documented in a timely manner.



Detailed Product Requirements SCS-C5 Configuration Software

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