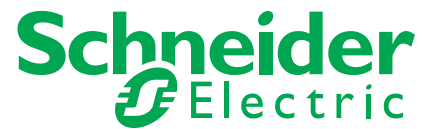




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Title : IR Hand Held Remote Control Applications

Category : C-Bus Hardware (Remotes)

Reference No: 13-004-01

Issue Date: 21 August 2013

Revision Date: 21 August 2013

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Key Words : C-Bus Remote Controls

Purpose

Within the C-Bus range, there are 10 available remote control models available to be purchased. It is important when deciding which remote control to purchase, that the compatibility of such remote is suited to the devices it intends to control. When determining whether a remote control is compatible for a device consider which physical medium the data is going to be transmitted across as well as the format of the data (protocol).

For the C-Bus remote control range the physical medium includes either Infra-red (IR) or C-Bus wireless RF. The data format (protocol) being used by Clipsal remote control includes the NEC IR protocol or proprietary C-Bus protocols. The remote control device as well as the device intended on being controlled must be compatible with each other.

The intention of this document is to quickly assess as to whether the C-Bus remote control device and the controlled device are compatible. Controlled devices include; 2000 Series IR capable switches, Neo Series Switches, Multi-sensors, Touch-screens and components of the Multi Room Audio System. The information published within this documentation is accurate to the date of publication. Capabilities of devices will vary in the future, and it is important that prior to committing any work that systems are thoroughly tested before implementation.

Terms and Abbreviations

IR – Infra-red

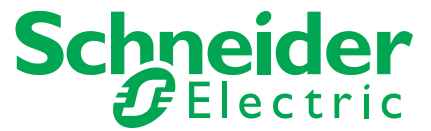
NEC – IR Transmission Protocol

RC – Remote Control

RF – Radio Frequency



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C-Bus Remote Control Quick Compatibility Check-list

Remote Controls	IR Format		Compatible Products							Range	Battery	
	Current	C-Bus	NEC	2000 Series	Neo	Neo 1.6.00+	Multi-sensor	Scene Master	C-Touch			MRA
5034TX*	✓			✓	✓	✓	✓				Long	2 x AAA
5034TX12*	✓			✓	✓	✓	✓				Long	2 x AAA
5038TX*	✓			✓	✓	✓	✓				Short	CR2025
5038TX2	✓			✓	✓	✓	✓				Short	CR2025
5084TX	✓			✓	✓	✓	✓				Long	2 x AAA
5088TX	✓			✓	✓	✓	✓				Long	2 x AAA
5035TX*			✓			✓		✓	✓		Medium	CR2025
5035TX2			✓			✓		✓	✓		Medium	CR2025
5030URC* (Universal)	✓	✓	✓	✓	✓	✓	✓	✓	✓		Long	4 x AAA
560125D* (MRA remote)			✓							✓	Long	2 x AAA

* - Products no longer available

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C-Bus Remote Bank Switching

IR Banking for C-Bus Remotes	Production
5034TX	A
5034TX12	ABC
5038TX	AB
5084TX	A or B
5088TX	AB or CD

NEC Protocol Introduction

The NEC protocol is an IR transmission protocol. It uses pulse distance modulation (encoding) to transmit data bits from the RC to the receiving device. The optimal carrier frequency for this protocol is 38kHz. The message format can be basically broken down into two main segments, the 'Address' and the 'Command' both containing 8-bits of data.

The 'Address' which can also be known as the 'Manufacturers Code', specifically targets a particular device within its IR transmission zone. The 'Command' which can be known as the 'Data Code' sends the buttons intended function. These functions typically include Play, Pause, Stop, etc.

When either the 'Address' or 'Command' segments are transmitted their inverted equivalent is sent immediately thereafter. This can be seen within the *Figure 1 - NEC Data Transmission Example*. In this example, the total transmission period for both the original and inverted copy equals a known value of 27ms. This constant value provides a means of data integrity testing.

When attempting to link a IR remote control with a touch screen, the 'Manufacturing Code' and the 'Data Code' will be requested.

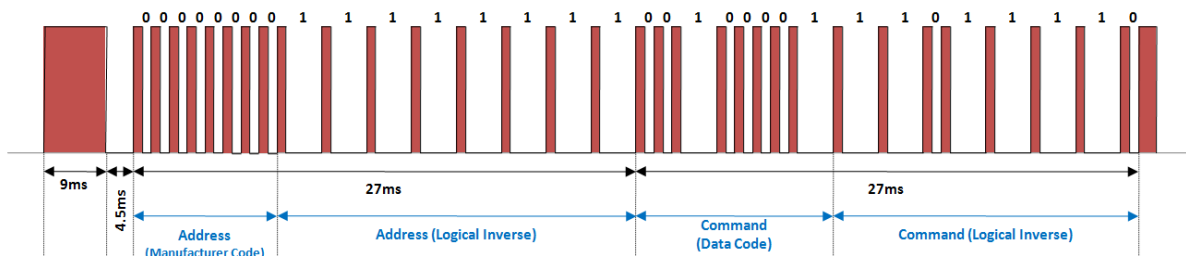




Figure 1 - NEC Data Transmission Example

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C-Bus Remote NEC Values

5035TX		
	Manufacture Code:	0
	Button Description	Data Code:
	'All OFF'	225
	1	1
	2	129
	3	65
	4	193
	5	33
	UP	161
DOWN	97	

5030URC		
	Manufacture Code:	Various manufacture codes available. Please refer to 5030URC User's Guide.
	Button Description	Data Code:
<p>Data code will vary given set manufacturing code. Please refer to the 5030URC User's Manual for further information. It is recommended that a C-Bus Touch Screen (Diagnostics Page) & 5030URC be used to map 5030URC buttons to Data Codes.</p>		

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560125D









Manufacture Code:	0
Button Description	Data Code:
'POWER'	249
'MUTE'	57
'V+'	9
'V-'	137
'BAL' Left	153
'BAL' Right	25
'+' Bass	41
'-' Bass	233
'+' Treble	169
'-' Treble	105
'PRV' Source	73
'NXT' Source	201
'1' Dynamic	89
'2' Dynamic	217

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General Misconceptions

It isn't uncommon for the capabilities between remote controls to be confused. Within the following sections we have added a comparison between the remote controls commonly misconceived for having the same or similar capabilities.

Misconception #1 – Both remotes are C-Bus wireless			
	Product: 5888TXBA		Product: 5088TX
	Capabilities: C-Bus wireless capable. No facilities for IR control.		Capabilities: IR control only. No facilities for C-Bus wireless.
	YES		NO
Misconception #2 – Both can be used with the Touch screen			
	Product: 5035TX		Product: 5038TX
	Capabilities: IR capable using the NEC Protocol.		Capabilities: IR capable using the C-Bus IR Protocol.
	YES		NO
Misconception #3 – Standard Saturn Series Switches can be controlled by remotes			
	Product: Standard Saturn Series		Product: All remotes
	Capabilities: Physical C-Bus connection. No Wireless RF or IR connectivity.		Capabilities: Wireless RF & IR Capabilities
			NO



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