

Combiner

V3Cmbine.exe

Written by Simon Dowson

Contents

Contents	2
1 Overview	3
1.1 Description.....	3
1.2 Device interface description	3
2 Driver setup	3
2.1 Ini file settings	3
2.2 Sample Ini	4
2.3 Level Configuration	4
2.3.1 Level Direction	4
2.3.2 Level Type	4
2.3.3 Driver Number	4
2.4 Mask Configuration	5
3 Infodriver.....	5
3.1 Introduction.....	5
3.2 Operation	6
3.3 Destination Level Mapping.....	6
3.4 Usage	6
4 External DLL	7
5 Documents referenced	7
6 Version history	7
6.1 Driver version	7
6.2 Document version	8

1 Overview

1.1 Description

The **Combiner** performs a similar function to the **Packager** but has few other similarities. The combiner is also able to make reverse routes by having sources in destination packages and vice versa. GPI's and Infodivers can also be included in packages. Theoretically any device on the BNCS network can be addressed via a package.

1.2 Device interface description

The Combiner attaches to 3 host infodivers on the same workstation, one for source packages, one for destination packages and one for level mapping, these are set in the Combiner section of the Dev_xxx.ini file.

Additional instances of the Combiner system can be run on separate workstations and the TxRx/RxOnly modes of the support infodivers are controlled by the Combiner. The active TxRx instance of the combiner can be selected remotely by using NetStatus messages (Applcore ES command).

2 Driver setup

The Combiner (V3CMBINE.EXE) actually performs the routing based upon the package information received from the Infodivers and the 'Level' configuration stored in its DEV_xxx.INI file.

First create a database profiles (DEX_xxx.INI) for the device Ids you intend to use with the Combiner and Infodivers. This can be done by either cloning existing DEV_xxx.INI files or making new ones using the ApplCore utility MDP.EXE. V3CMBINE.EXE takes a single command line parameter. This is the router driver number, in other words the Id to which package execution commands are to be sent. It can be between 1 and 999. No two drivers may use the same number and it serves as the unique number by which the combiner is addressed from the ApplCore panels or other client applications.

The combiner can be instructed, either locally at the driver application or from ApplCore to inhibit or lock out any destination or range of destination packages.

2.1 Ini file settings

In addition to the database sections used by all drivers, the Combiner has three sections of its own. The first has the heading **[Combiner]** and deals with the global parameters of the driver.

Item	Value	Comment
[Combiner]		
Name=Main Packager		The name for the packaging combination. This is for reference only and not used internally by the driver.
SaveDelay=5	5	The maximum delay in minutes before any changes to the combiners tally table are saved to disk.
SrcePkgInfold=XXX		The Driver Id of the source package InfoDriver. The default is 1 Id number greater than the combiners Id.
DestPkgInfold=YYY		The Driver Id of the destination package InfoDriver. The default is 2 Id numbers greater than the combiners Id.

Item	Value	Comment
NameLength=8	8	The character width of the source and destination package list boxes.
RevertiveLevel=1	1	If this is other than zero revertives will only be generated from the Combiner if the mask command contains the specified level. Valid levels are 1 through 32.
ExternalDll	NONE	The combiner will try to hook into the specified dll if it can be found in the windows path, if not the combiner will continue to operate as normal.

2.2 Sample Ini

```
[Combiner]
Name=Main Packager
SaveDelay=5
SrcePkgInfoId=XXX
DestPkgInfoId=YYY
NameLength=8
RevertiveLevel=1
Simulation=0
ExternalDll=NONE
```

2.3 Level Configuration

There can be up to 32 levels. Each level has an entry in the **[Levels]** section of the Combiners DEV_XXX.INI file. Each entry consists of a comma delimited list of attributes. The first three are mandatory as they are required for the Combiner to function. Any other data that follows the first three attributes is ignored.

2.3.1 Level Direction

The first attribute is the direction of the level. If set to 'F' for Forwards the Combiner will execute the level normally i.e. *Source to Destination*. If set to 'R' for Reverse the level will be executed *Destination to Source*. This feature enables sources to be put into destination packages and vice versa.

2.3.2 Level Type

The Combiner is able to execute Routes, GPI's and write to Infodrivers. The second parameter should be set to 'R', 'G' or 'I' respectively.

2.3.3 Driver Number

The third parameter is the driver Id. The driver may be one of the generic types such as GRD, GPID_722, GPID_725 and INFODRIV, or may be a complex driver or controller.

An example of the first 6 levels is shown below.

```
[Levels]
```

Level_01=F,R,1	This level executes routes in a forward direction on driver 1.
Level_02=F,G,55	This level executes GPI's in a forward direction on driver 55.
Level_03=F,I,201	This level executes InfoDriver writes in a forward direction to driver 201.
Level_04=R,R,406	This level executes routes in a forward direction on driver 406.
Level_05=R,G,111	This level executes GPI's in a reverse direction on driver 111.
Level_06=R,I,6	This level executes InfoDriver writes in a reverse direction on driver 6.

2.4 Mask Configuration

The mask allows only given levels of a package to be executed. Normally this is supplied in the ApplCore Router Crosspoint command as follows:-

RC 680 27 311 '1, 4, 8'

This command would be an instruction to Combiner 680 to route source package 27 to destination package 311 on levels 1, 4 and 8. Other levels in the source and destination packages will be ignored. Alternatively the mask may be specified as follows:-

RC 680 27 311 'FULLFACS'

Here 'FULLFACS' is an entry in the [Masks] section of the Combiners DEV_xxx.INI file.

[Masks]

Mask_01=FULLFACS,1,2,3,4,5,6,7,8	Using this mask would execute levels 1 through to 8.
Mask_02=LISTEN,1,2,3	Using this mask would execute levels 1, 2 and 3 only.
Mask_03=FACSONLY,6,7,8	Using this mask would execute levels 6, 7 and 8 only.

3 Infodriver

3.1 Introduction

The source and destination packages are contained in InfoDriver slots. The format of a package is a comma delimited list of numbers. The numbers themselves refer to source or destination indices. The order in which the numbers appear corresponds to the device levels specified in the Combiners DEV_xxx.INI file. All levels must be specified. If a level is to be omitted then a '-' should be used in place of a source or destination. A zero indicates that the GRD at the end of the chain should substitute its park source. A package is modified by polling the source or destination InfoDriver as appropriate, splitting up

the string into individual number, modifying those that need changing, rebuilding the string and writing it back to the same slot.

3.2 Operation

The Combiner receives a Router Crosspoint command addressed to it, containing the indices of the source and destination packages to execute together with a 'mask' of levels on which to make routes. e.g. if the combiner's Id' was 680:-

RC 680 34 198 '1,2,3,14,15'

This would route source package 34 to destination package 198 on levels 1, 2, 3, 14 and 15. If valid sources and destinations exist in the packages for those levels then the combiner will generate individual RC commands for them. If some levels have been configured in the combiners DEV_XXX.INI file to be GPI's or Infodrivers then the appropriate GS and IW commands will be generated.

If the execution of the source to destination package results in any commands being generated, the Combiner will return a tally for that destination package.

3.3 Destination Level Mapping

The combiner enables the destination levels of a package to be mapped to other levels. This means that levels sharing the same physical hardware for different functions can map the functions onto one another. For example if levels 3 & 4 are main audio feeds and levels 5 & 6 are clean effects then, providing the same physical router is being used for all the levels, the main audio and clean effects can be swapped over by mapping one level to another without changing the contents of the destination package.

An InfoDriver is used to hold the destination level mapping in the form of a comma delimited list. The order in which the numbers appear corresponds to the device levels specified in the Combiners DEV_XXX.INI file. The numbers themselves represent the levels to map on to. The default is a one for one relationship and the combiner will initially fill the level mapping InfoDriver slots with :-

1,2,3,4,5,6,7,8,9,10,11,12,13,....,32

The simple four level example below illustrates how the mapping can be used. All levels are forward routing. The combiners Id is 680 and the router Id's for the four levels are 201 through 204.

3.4 Usage

Slot Number	Information and Values of Slot
11,22,33,44	Source Package 2
111,222,333,444	Destination Package 4
1,2,3,4,5,6,7,8 etc	Destination Mapping 4
	The command RC 680 2 4 '1,2,3,4,' would generate:
	RC 201 11 111
	RC 202 22 222
	RC 203 33 333
	RC 204 44 444
	Changing the destination mapping...
	Destination Mapping 3,4,1,2,5,6,7,8 etc would generate:

Slot Number	Information and Values of Slot
	RC 201 11 333
	RC 202 22 444
	RC 203 33 111
	RC 204 44 222

4 External DLL

The combiner will try to hook into the specified dll if it can be found in the windows path, if not the combiner will continue to operate as normal. The filename of the loaded dll is displayed in the bottom corner of the main dialog under the Output command list.

The combiner output commands are initially offered to the dll for external processing and onward transmission. The external dll should return TRUE if the command is accepted for processing otherwise the combiner will continue and validate (range check etc) the command internally before sending it to the network.

Example usage - W1 Lawo router expansion goes beyond the BNCS limit of 4096 destinations and consequently uses secondary device numbers. The Lawo specific commands from the combiner are filtered and re-directed to the appropriate devices by an external dll.

5 Documents referenced

Infodivers document: [infodivers.shtml](#)

6 Version history

6.1 Driver version

Version No	Date	Details	Name
3.00.00	06/09/05	Commenced development based on COMBINER V2.00.17	
3.00.01	01/12/05	Completed 32 bit messaging	
3.00.02	02/12/05	Bug fix to InfoDriver revertives	
3.00.03	02/12/05	Bug fix correct for very long masks.	
3.00.04	13/12/05	Fix to GRProf_Init() to create default masks	
3.00.05	17/01/06	If level is in REVERSE then the previous source package entry is parked rather than the destination	
3.00.06	07/02/06	No longer transmits commands if in RxOnly mode	
3.00.07	08/02/06	Bug fix to previous source package tokeniser in GRCmd_RouterConnect()	

3.01.00	15/02/06	Now uses GetConfigDirectory in bncs_gcd.cpp/h GetConfigDirectory() now GetBNCSSConfigDirectory()	
3.01.01	23/04/07	Now uses GetBNCSSystemDirectory for LoadLibrary() calls	
3.02.00	06/09/05	Rebuilt from CVS	
3.02.01	10/05/07	RxOnly behaviour changed so that internal tally tables are updated.	
3.02.02	02/10/07	LoadLibrary() now uses v4 directory\windows\lib	
3.03.00	14/12/07	LoadLibrary() now uses GetBNCSSystemDirectory and bncs_gcd.cpp and bncs_gcd..h now return correct system path	
3.04.00	08/01/09	Now updates the listbox when RM commands are issued	
3.04.01	09/01/09	Devices should now TXRX together. now sends no, full, or partial tally dump to the network	
3.04.02	26/01/09	Sends tally dump for database 2 as well as database 0	
3.04.03	26/01/09	Corrects mistake in multiple-device TXRX handling	
3.04.04	12/11/09	Add remote TXRX switching using NS & ES messages Synchronises devices at startup. Bug fixes to Mask parameters	Steve Lowe
3.04.05	27/11/09	Further bug fix for blank mask. Rationalise external device sync	Steve Lowe
3.04.06	02/02/10	Incoming command buffer increased from 64 to 128 chars	Dave Yates
3.04.07	04/03/10	Merges CVS branch (v3.03.01) with fix for IW message clash using BBC_POSTEDCOMBINERIWMSG to return control to windows before processing IW's. Command parser revised.	SJ/RK/SL
3.04.08	27/09/11	CVS branched at 3.04.07 while v3.05.00 testing is delayed. Minor fix to prevent DAT file etc being cleared if closing after CSI not found.	Steve Lowe
3.05.00	25/05/11	Adds facility to load an external dll to process output commands.	Steve Lowe
3.05.01	27/09/11	Minor fix also applied to 3.05.00 to prevent DAT file etc being cleared if closing after CSI not found.	Steve Lowe
3.05.02	25/01/12	Additional min index checking. Fix to package parsing for Reverse Park which omitted final level (#2178)	Steve Lowe
3.05.03	10/07/12	Adds a BBC_IDSLOTMSG handler to simply acknowledge the received message and satisfy the infodriver resilience check	Steve Lowe

6.2 Document version

Version No	Date	Details	Name
	Feb 09	Updated template and changed from html to word/pdf doc	A Atkin
1.00.01	Nov 09	V3 revision saved as V3Cmbine.doc	Steve Lowe
1.00.02	May 11	Version updates	Steve Lowe
1.00.03	Sept 11	Version & branding updates	Steve Lowe
1.00.04	Sept 11	Version updates	Steve Lowe
1.00.05	Jan 12	Version updates	Steve Lowe

1.00.06	Jul 12	Version updates	Steve Lowe
---------	--------	-----------------	------------

Atos IT Solutions and Services Limited
Faraday House
Sir William Siemens Square
Frimley, Camberley
Surrey, GU16 8QD
Tel.: +44 (0)1276 696000