ON-AIR 3000/2500/1500

Communication Protocol for Broadcast Automation

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VERSION LIST

Version	Date	Comments
0.1	9. July 2003	1st draft of this document
0.4	20. July 2003	Description of commands adapted to OA3000. New chapter: Changes of protocol
0.8	12. August 2003	all OA2000 command descriptions adapted to OA3000
0.9	10.September 2004	According to Version V1.1 of the OnAir3000: InputLines increased to 255 for SAS_INPUTROUTING, Allow disconnection of InputLines (=0).
1.0	20.June 2005	New standard MONITORA commands added for BCA Remote Control: BUTTON_PUSHED BUTTON_RELEASED SET_BUTTON_LIGHT Chapter 4.10 Prelistening revised. No functional changes. SELECT_SOURCE/SOURCE_SELECTED allows also selecting EXT PFL1 and EXT PFL 2 inputs. SET_ZI no longer supported
1.1	27. May 2006	Due to the implementation of Mic Access Control mechanism in V2.1, the analogue mic gain is no longer accessible by MONITORA. The SET_FADER_INPUT_GAIN telegram controls the DSP parameter “cal” (for mic and line inputs). The FADER_INPUT_GAIN telegram reports the value of the DSP parameter “cal” (for mic and line inputs).
1.2	29 June 2006	FADERSTATUS is issued always by OA3000 on FaderClosed.
1.3	4.October 2006	RESET is no longer supported by the OnAir3000.
1.4	16.January 2007	Chapter 5.2.1 SELECT_SOURCE Detailed description of how the OnAir3000 searches for the corresponding LogicalInput of a specified source. Chapter 5.7.1 SET_TIME Description of *timeSyncTimeout* added
1.5	02. February 2007	Extended 5.1 support Chapter 5.4.1 SET_FADER_AUX_MODE considering Desk Resource Definition for A/B Mode
1.6	21.September 2007	Chapter 5.1.3 DESK_STATUS: Note added: All incoming messages are ignored until DESK_STATUS 0x02 is sent. Chapter 4.3 Power Up divided into Console power up and desk power up. More detailed description of the scenarios.

1.7	12. October 2007	Chapter 5.2.1 SELECT_SOURCE Must consider *location* when searching for a free strip channel Chapter 5.4.11 SET_PRELISTEN_ON Chapter 5.4.12 SET_PRELISTEN_OFF Must consider *location* when switching PFL ON/OFF Chapter 5.3.1 SET_SAS_INPUTROUTING Chapter 5.3.3 SAS_INPUTROUTING Definition of Input Lines for 5.1 Surround Inputs Chapter 5.4.1 SET_FADER_AUX_MODE Note added to consider the *desk_assignment* Chapter 2.2 MONITORA for Multiple Sessions added.
1.8	5. November 2007	Modifications for OnAir3000 V3.0 Release Chapters 5.4.2 SET_FADER_LEVEL 5.7.5 SET_FADER_LEVEL_ONLY 5.4.4 FADER_LEVEL 5.7.10 SET_SUM_FADER_LEVEL 5.7.12 SUM_FADER_LEVEL Fader Level limited to +10dB
1.9	26. March 2008	Document Revised for OnAir2500 Chapter 5.1.2 DEVSTATUS New error Codes added: 0x04: invalid SumBusNr 0x05: invalid AuxNr In the following commands, arguments PRG B, 5.1A, 5.1B, AUX3, AUX4, N-X9..N-X16, all SubGroups are ignored in case of OnAir2500: SET_FADER_AUX_MODE RESET_SUM_FADER_LEVEL SET_SUM_FADER_LEVEL GET_SUM_FADER_LEVEL SUM_FADER_LEVEL The following commands are ignored, in case of a OnAir3000/2500 equipped with motorized faders, as long as the fader is touched: SET_FADER_LEVEL SET_FADER_LEVEL_ONLY SET_SUM_FADER_LEVEL
1.10	14. August 2008	Chapter 5.3.1 SET_SAS_INPUTROUTING Chapter 5.3.3 SAS_INPUTROUTING -Consideration of I/O Sharing NetConsumers -Supports only 254 HD Links. 0xFF is used to indicate undefined.
1.11	03. November 2008	Chapter 6.2.2.1 DESELECT_SOURCE - Optionally removes inputs from strip channel

1.12	10. September 2009	SumBusNr of all SUM_FADER_LEVEL telegrams extended for 48 N-X summing busses. Chapter 5.2.2 SOURCE_SELECTED Telegram is also sent spontaneously, if a source is re-assigned to any strip channel
1.13	8.November 2010	Chapter 5.4.6 FADERSTATUS and 5.6.2 SOURCE_STATUS LogicalAssignment allows GPIO and Custom Logic LevelProducer to provide status information for the appropriate commands. Chapter 5.6.1 SET_PROTOCOL The SOURCE_STATUS is reported for all LogicalInputs instead of just selected ones.
1.14	3.December 2010	Chapter 5.4.6 FADERSTATUS and 5.6.2 SOURCE_STATUS A LogicalAssignment now contains an index of a LogicalInput instead of a SourceName.
1.15	6. December 2010	The Name argument of the following commands relate to the BasicLabel of a LogicalInput: 5.2.1 SELECT_SOURCE 5.2.2 SOURCE_SELECTED 5.6.2.1 SOURCE_STATUS is Source Driven 5.6.2.2 SOURCE_STATUS is LevelProducer driven
1.16	12. January 2011	In the following commands, arguments AUX1..AUX4 and N-X5..N-X48 are ignored in case of OnAir1500: 5.4.1 SET_FADER_AUX_MODE 5.7.9 RESET_SUM_FADER_LEVEL 5.7.10 SET_SUM_FADER_LEVEL 0 GET_SUM_FADER_LEVEL 5.7.12 SUM_FADER_LEVEL
1.17	21. January 2011	Chapter 5.4.17 SET_CHANNEL_BUTTONLIGHT New Telegram implemented.
1.18	24. January 2011	General Document Revision for OnAir1500 6 Protocol changes Extended by OnAir1500. 5.2.3 DESELECT_SOURCE As a consequence, the status of FADER_READY and CHANNEL_BUTTONLIGHT is reset as well as the FADER_DISPLAY2 text is reset to the Basic Label. (No software change).
1.19	22. March 2011	5.2.3 DESELECT_SOURCE The comment added in version 1.18, the FADER_DISPLAY2 text is reset to the Basic Label, was wrong. It was removed. (No software change).
1.20	27 June 2011	5.4.4 FADER_LEVEL Added description of the FaderLevelMode.
1.21	8. October 2012	LOW LEVEL PROTOCOL moved to chapter 2 Low Level Protocol and TCP/IP support for MONITORA added. (This was only a document update – no software change)

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1 INTRODUCTION

This document describes the communication between the On-Air 3000/2500/1500 and a Broadcast Automation System, further called BCA, using a serial or TCP/IP interface.

The protocol is based on the Schnittstellen Spezifikationen Regiepult of DAS (Digitale Steuerungs- und Automationstechnik, Thomas Volgmann) furthermore called [MONPROT], which was originally defined by VCS and SIEMENS to control the DIAMOND of Monitora. The RAS – Protocol is the English version of Schnittstellen Spezifikationen Regiepult.

The implementation described here for the On-Air 3000/2500/1500 is a subset of [MONPROT].

The subject of this document is to address On-Air 3000/2500/1500 specific aspects and define the console specific behaviour.

1.1 Overview

Chapter 2 Low Level Protocol shows an overview of the physical interfaces. For the low level protocol it refers to the chapters of [MONPROT], since the low level protocol is implemented in the same way.

Chapter 3 List of Commands gives an overview of all commands defined within [MONPROT]. The ones in bold letters are implemented in On-Air 3000/2500/1500.

Chapter 4 Message Flow Diagrams shows some message flow diagrams on the serial interface of the most popular application sequences.

Chapter 5 Telegram Description contains the syntax of each telegram from/to BCA.

2 LOW LEVEL PROTOCOL

2.1 Physical Interface

On-Air 3000/2500/1500 consoles provide two types of physical interfaces.Serial Interface and TCP/IP socket communication over Ethernet.

As the following table shows the Frame Protocol defined in chapter 2.3 Frame Protocol can be transported over a serial interface or using Ethernet.

<table>
<tr><th>OSI Layer</th><th>Name</th><th>TCPI/P</th><th>Serial</th></tr>
<tr><td>5</td><td>Session</td><td colspan="2">MONITORA Frame Protocol</td></tr>
<tr><td>4</td><td>Transport</td><td>TCP</td><td rowspan="3">RS232/RS422/RS485</td></tr>
<tr><td>3</td><td>Network</td><td>IP</td></tr>
<tr><td>2</td><td>Data Link</td><td rowspan="2">Ethernet</td></tr>
<tr><td>1</td><td>Physical</td><td></td></tr>
</table>

The type of interface is configured for each session in the *cab_interface.ini* – file.

Both types of interface can be used at the same time if required.

2.1.1 Serial Interface

On-Air 3000/2500/1500 consoles provide a female DB9 connectors with DTE pin out on the rear panel to connect serial devices (RS-232/RS422/RS485).

Two DB9 connectors are available in case of an OnAir3000 SCoreLive.

By< default, serial interface works in UART mode (universal asynchronous receiver transmitter):

Bits: 8
Stop Bits: 1
Parity: No
Baud Rate: 38,4 kBaud

For the details, refers to the following chapter 3 Physikalische Schnittstelle of [MONPROT].

2.1.2 TCP/IP Socket Communication

To control On-Air 3000/2500/1500 consoles over Ethernet, the console listens on preconfigured TCP/IP ports 7400..7499.

TCP/IP ports are configured for each session in the *cab_interface.ini* – file.

The console immediately detects connection lost when the remote application closes the socket (graceful termination).
In any case the console detects connection lost when alive is not maintained as described in chapter 4.1 Check Device Status.

2.2 MONITORA for Multiple Sessions

The On-Air 3000/2500/1500 supports multiple session. Each session must be assigned to a serial COM port.

Typical MONITORA multi session applications are

- A/B Desk
- Split Desk
- OnAir- and Jingle Automation System
- The combination of all

Each session must be defined in the *cab_interface.ini* – file with its unique name and COM port.

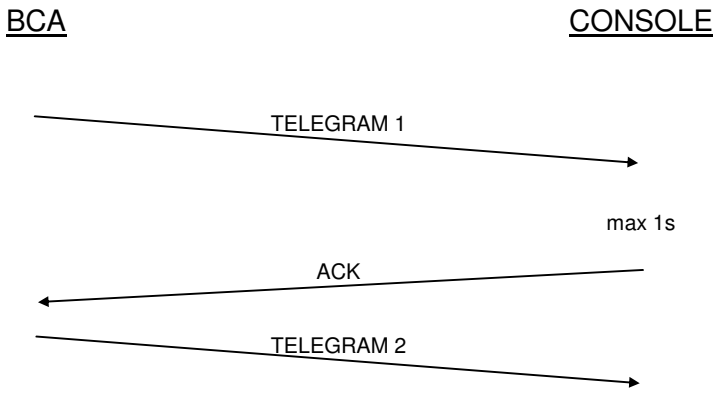
2.3 Frame Protocol

For the Frame Protocol refers to the following chapter 4 Rahmenprotokoll of [MONPROT].

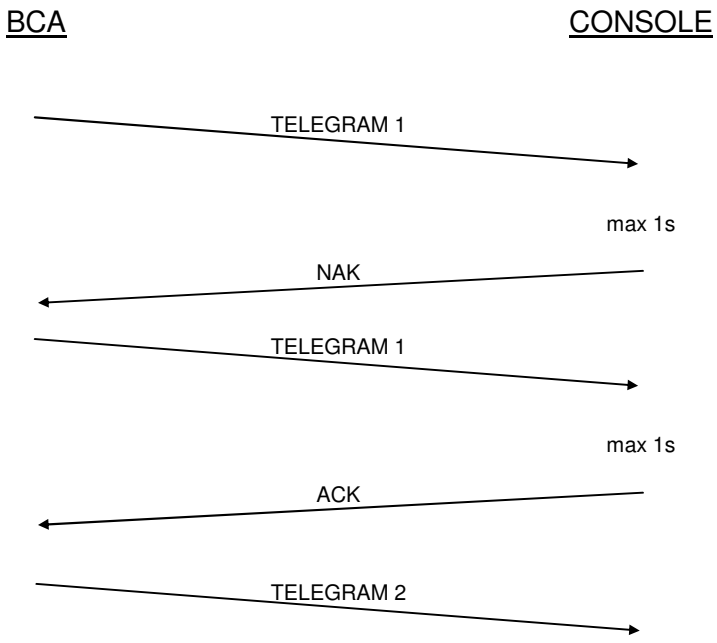
2.4 Handshake

The control bytes ACK and NAK are used to provide a software-handshake.

Each telegram must be replied within less than 1s by ACK or NAK. A second telegram must not be sent before any ACK/NAK response is received.



If the response of a telegram is negative (NAK), it will be sent again up to tree times.



3 LIST OF COMMANDS

3.1 Standard Commands

Standard commands are general commands. They are recognised through the one byte code which MSB is zero.

The following table gives an overview of all standard commands defined by [MONPROT]. Telegrams which are not supported by On-Air 3000/2500/1500 are emphasised (grey background).

Telegram	Direction	Code	Parameter
		0x00	
GET_DEVSTATUS	BCA->CONS	0x01	
	CONS->BCA		
DEVSTATUS	BCA->CONS	0x02	Code
	CONS->BCA		
GET_FADERSTATUS	BCA->CONS	0x03	FaderNr
FADERSTATUS	CONS->BCA	0x04	FaderNr, FaderStatus
GET_SAS_INPUTROUTING	BCA->CONS	0x05	FaderNr
SAS_INPUTROUTING	CONS->BCA	0x06	FaderNr, InputLine
SELECT_SOURCE	BCA->CONS	0x07	Name
SOURCE_SELECTED	CONS->BCA	0x08	Name, FaderNr
DESELECT_SOURCE	BCA->CONS	0x09	FaderNr
SOURCE_DESELECTED	CONS->BCA	0x0A	FaderNr
SET_FADER_INPUT_GAIN	BCA->CONS	0x0B	FaderNr, Gain
BUTTON_PUSHED	CONS->BCA	0x0C	ButtonNr
BUTTON_RELEASED	CONS->BCA	0x0D	ButtonNr
SET_FADER_LEVEL	BCA->CONS	0x0E	FaderNr, Level, Time
SET_SAS_INPUTROUTING	BCA->CONS	0x0F	FaderNr, InputLine

Telegram	Direction	Code	Parameter
SET_DISPLAY	BCA->CONS	0x10	DisplayNr, Text
SET_FADER_DISPLAY1	BCA->CONS	0x11	FaderNr, Text
SET_FADER_DISPLAY2	BCA->CONS	0x12	FaderNr, Text
SET_BUTTON_TEXT	BCA->CONS	0x13	ButtonNr, Text
SET_BUTTON_LIGHT	BCA->CONS	0x14	ButtonNr, Status
SET_FADER_READY	BCA->CONS	0x15	FaderNr
	CONS->BCA		
SET_PRELISTEN_ON	BCA->CONS	0x16	FaderNr
	CONS->BCA		
SET_PRELISTEN_OFF	BCA->CONS	0x17	FaderNr
	CONS->BCA		
SET_FADER_PLAYTIME	BCA->CONS	0x18	FaderNr, PlayTime
CHANNEL_BUTTON_PUSHED	CONS->BCA	0x19	FaderNr, ButtonNr
SET_CHANNEL_BUTTONLIGHT	BCA->CONS	0x1A	FaderNr, ButtonNr, Status
SET_CHANNEL_BUTTONTEXT	BCA->CONS	0x1B	FaderNr, ButtonNr, Text
STOP_PLAYTIME	BCA->CONS	0x1C	FaderNr
START_PLAYTIME	BCA->CONS	0x1D	FaderNr
GET_FADER_LEVEL	BCA->CONS	0x1E	FaderNr
FADER_LEVEL	CONS->BCA	0x1F	FaderNr, Level

Telegram	Direction	Code	Parameter
RESET_FADER_READY	BCA->CONS	0x20	FaderNr
SET_GPI	BCA->CONS	0x21	GPI_Nr, Status
GPI_EVENT	CONS->BCA	0x22	GPI_Nr, Status
SET_PROTOCOL	BCA->CONS	0x23	Status
SOURCE_STATUS	CONS->BCA	0x24	Name, Status
NEXT_SOURCE	CONS->BCA	0x25	FaderNr, Name
SET_NEXT_BUTTONLIGHT	BCA->CONS	0x26	FaderNr, Status
ACCESS_FADER	BCA->CONS	0x27	FaderNr
SET_FADER_AUX_MODE	BCA->CONS	0x28	FaderNr, AuxNr, AuxMode
DESK_STATUS	CONS->BCA	0x29	Code
SET_ZI	BCA->CONS	0x2A	FaderNr, ZiInfo
GET_FADER_INPUT_GAIN	BCA->CONS	0x2B	FaderNr
FADER_INPUT_GAIN	CONS->BCA	0x2C	FaderNr, Gain
SET_FADER_START	BCA->CONS	0x2D	FaderNr, Status
		0x2E	
		0x2F	

Telegram	Direction	Code	Parameter
INIT_DOWNLOAD	BCA->CONS	0x60	
NEED_DOWNLOAD	CONS->BCA	0x61	
START_DOWNLOAD	CONS->BCA	0x62	
ERROR_DOWNLOAD	CONS->BCA	0x63	
PROGRAM_STARTED	CONS->BCA	0x64	
		0x65	
		0x66	
		0x67	
		0x68	
		0x69	
		0x6A	
		0x6B	
		0x6C	
		0x6D	
		0x6E	
		0x6F	

Telegram	Direction	Code	Parameter
SEND_SES_STATUS	CONS->BCA	0x70	Status
REQUEST_SES_STATUS	BCA->CONS	0x71	
RESET	BCA->CONS	0x72	
		0x73	
		0x74	
		0x75	
		0x76	
		0x77	
		0x78	
		0x79	
		0x7A	
		0x7B	
		0x7C	
		0x7D	
		0x7E	
		0x7F	

3.2 Extended Commands

Extended commands are project specific commands. They are recognised through the two byte code, where the MSB of the first byte is always set. Refer to chapter 4 Rahmenprotkoll of [MONPROT].

The following extended commands are implemented in On-Air 3000/2500/1500:

Telegram	Direction	Code	Parameter
SET_TIME	BCA->CONS	0x8000	Hours, Minutes, Seconds
SET_DATE	BCA->CONS	0x8001	Day, Month, Year
SET_CHANNEL_ON	BCA->CONS	0x8002	FaderNr, Status
		0x8003	
		0x8004	
		0x8005	
		0x8006	
		0x8007	
		0x8008	
		0x8009	
		0x800A	
		0x800B	
		0x800C	
RESET_FADER__LEVEL	BCA->CONS	0x800D	FaderNr, Time
SET_FADER_LEVEL_ONLY	BCA->CONS	0x800E	FaderNr, Level, Time
RESET_FADER__LEVEL_ONLY	BCA->CONS	0x800F	FaderNr, Time

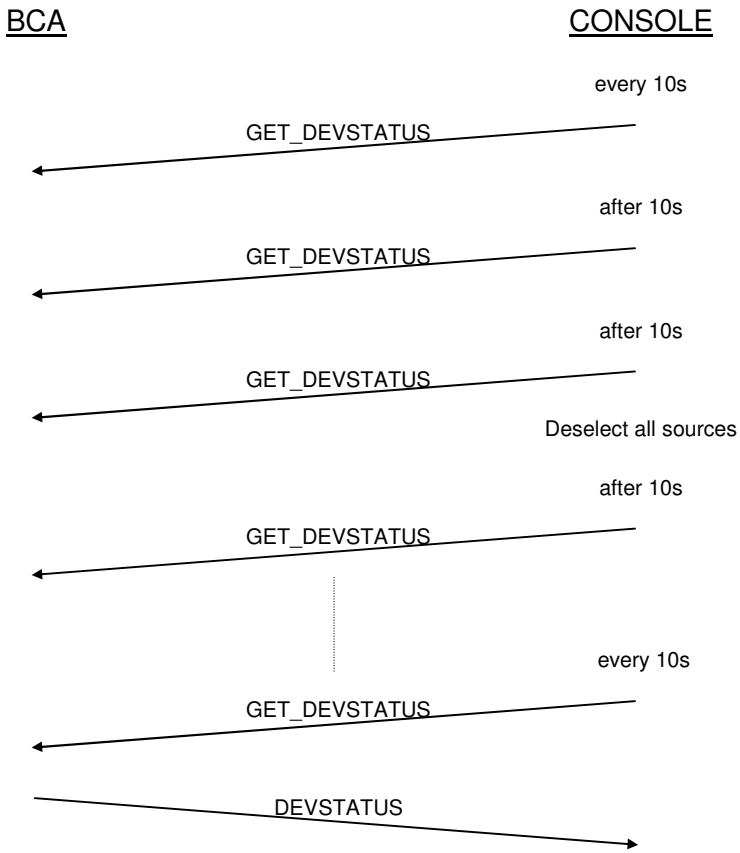
Telegram	Direction	Code	Parameter
		0x8010	
		0x8011	
GET_CHANNEL_ON	BCA->CONS	0x8012	FaderNr
CHANNEL_ON	CONS->BCA	0x8013	FaderNr, Status
		0x8014	
		0x8015	
		0x8016	
		0x8017	
		0x8018	
		0x8019	
		0x801A	
		0x801B	
		0x801C	
RESET_SUM_FADER_LEVEL	BCA->CONS	0x801D	SumBusNr, Time
SET_SUM_FADER_LEVEL	BCA->CONS	0x801E	SumBusNr, Level, Time
		0x801F	
		0x8020	
		0x8021	
		0x8022	
		0x8023	
		0x8024	
		0x8025	
		0x8026	
		0x8027	
		0x8028	
		0x8029	
		0x802A	
		0x802B	
		0x802C	
		0x802D	
GET_SUM_FADER_LEVEL	BCA->CONS	0x802E	SumBusNr
SUM_FADER_LEVEL	CONS->BCA	0x802F	SumBusNr, Level

4 MESSAGE FLOW DIAGRAMS

This chapter shows some message flow diagrams on the serial interface of the most popular application sequences. Low level protocol is omitted here.

4.1 Check Device Status

The On-Air 3000/2500/1500 sends the GET_DEVSTATUS telegram every 10s, if no other message is received.



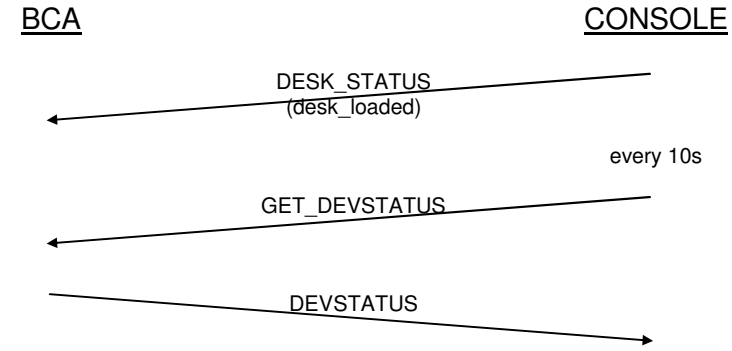
If the response stays away for three GET_DEVSTATUS requests, the On-Air 3000/2500/1500 assumes the BCA was disconnected and deselects all selected sources.

4.2 Reset

The RESET command is no longer implemented in the OnAir3000 with software version V2.2 or higher.

4.3 Power Up

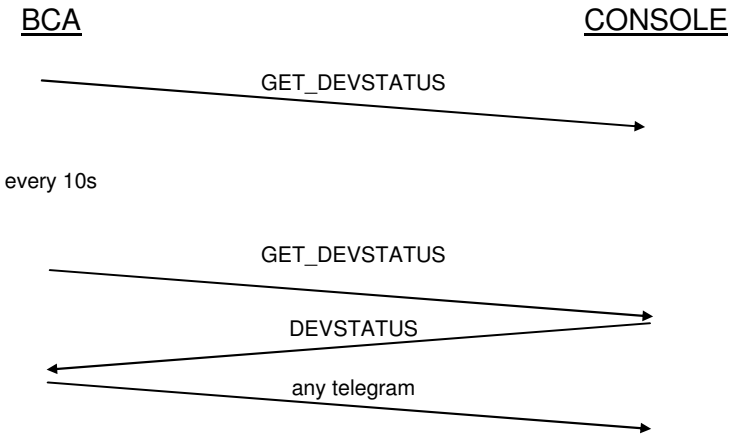
4.3.1 Console Power Up



Note, that all telegrams ignored (neither accepted nor acknowledged) by the console before DESK_STATUS is sent.

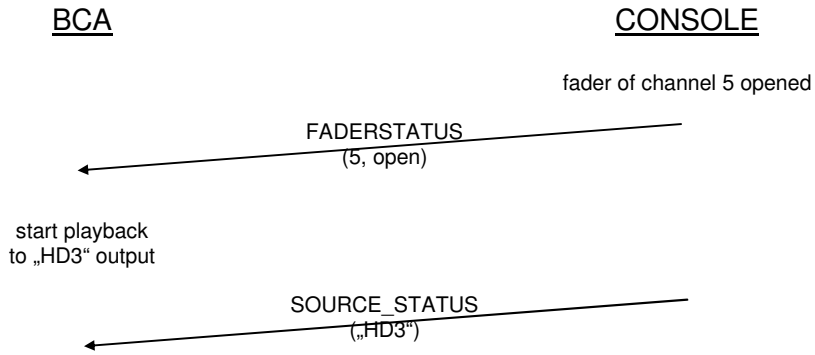
4.3.2 BCA Power Up

The BCA must not send any telegram to the On-Air 3000/2500/1500 before reception of a DEVSTATUS telegram. Telegrams received before may be ignored, if the console is also starting up at this time.



4.4 Start Next Take from Schedule Manually

Open the fader of channel 5:

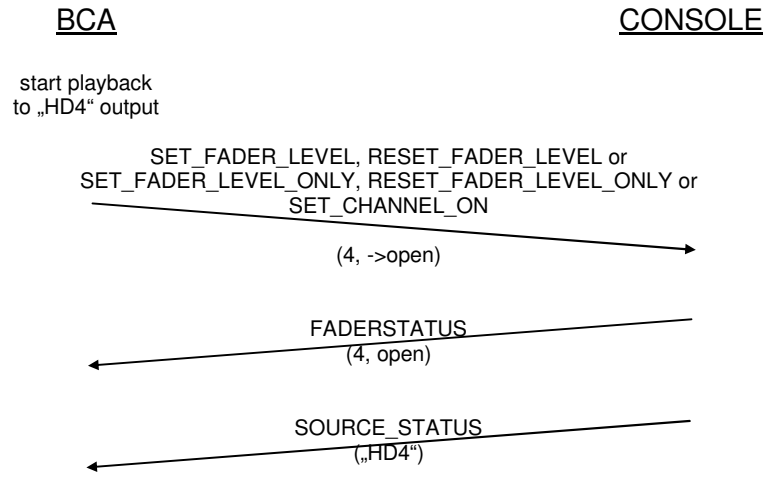


As the next take is started manually by opening a „ready“ fader, the BCA must not send a SET_FADER_LEVEL telegram. In this case the fade in is controlled manually.

4.5 Start Next Take from Schedule Automatically by BCA

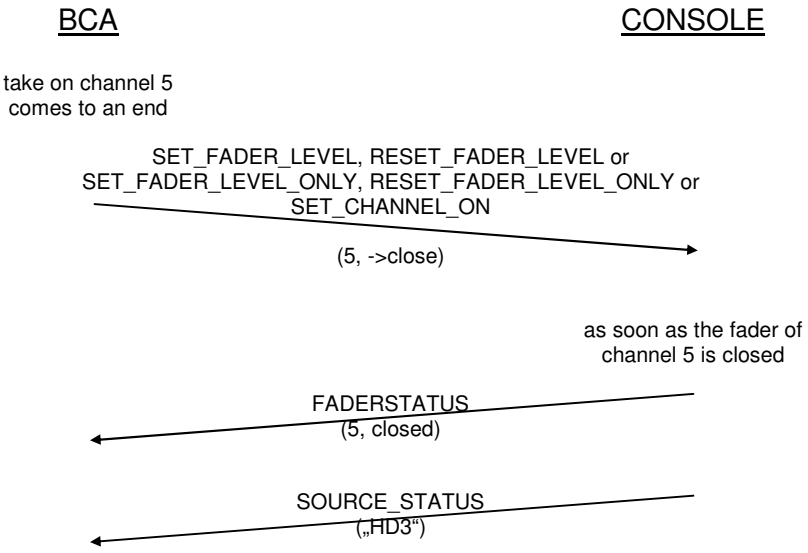
The BCA starts the next take, which was previously prepared (chapter 4.7 BCA Prepares Next Take from Schedule), by opening the fader of channel 4 or set the channel 4 to ON. The The RESET_FADER_LEVEL rsp. RESET_FADER_LEVEL_ONLY commands can also be used to open the channel, if the physical fader position is “opened”:

To guarantee the sum fader of the program- rsp. record bus is open, the BCA can control them using the SET_SUM_FADER_LEVEL command.

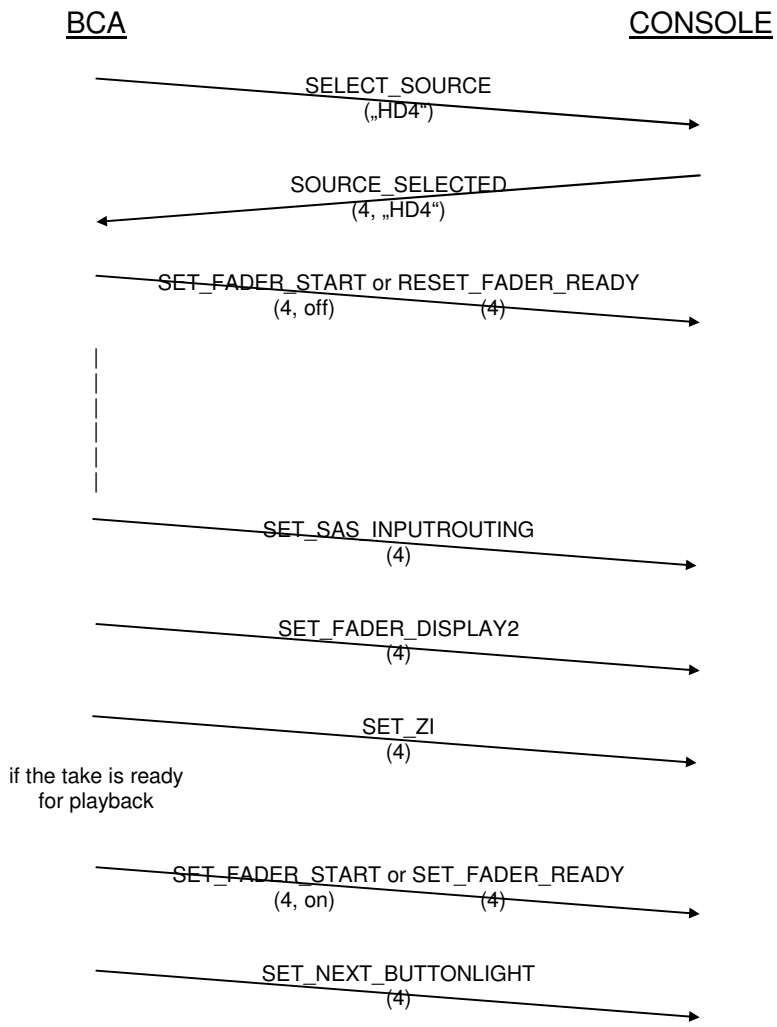


4.6 Stop the Current Take Automatically by BCA

The BCA stops the current take by closing the fader of channel 4, or set the channel 4 to OFF. The RESET_FADER_LEVEL rsp. RESET_FADER_LEVEL_ONLY commands can also be used to close the channel, if the physical fader position is “closed”:



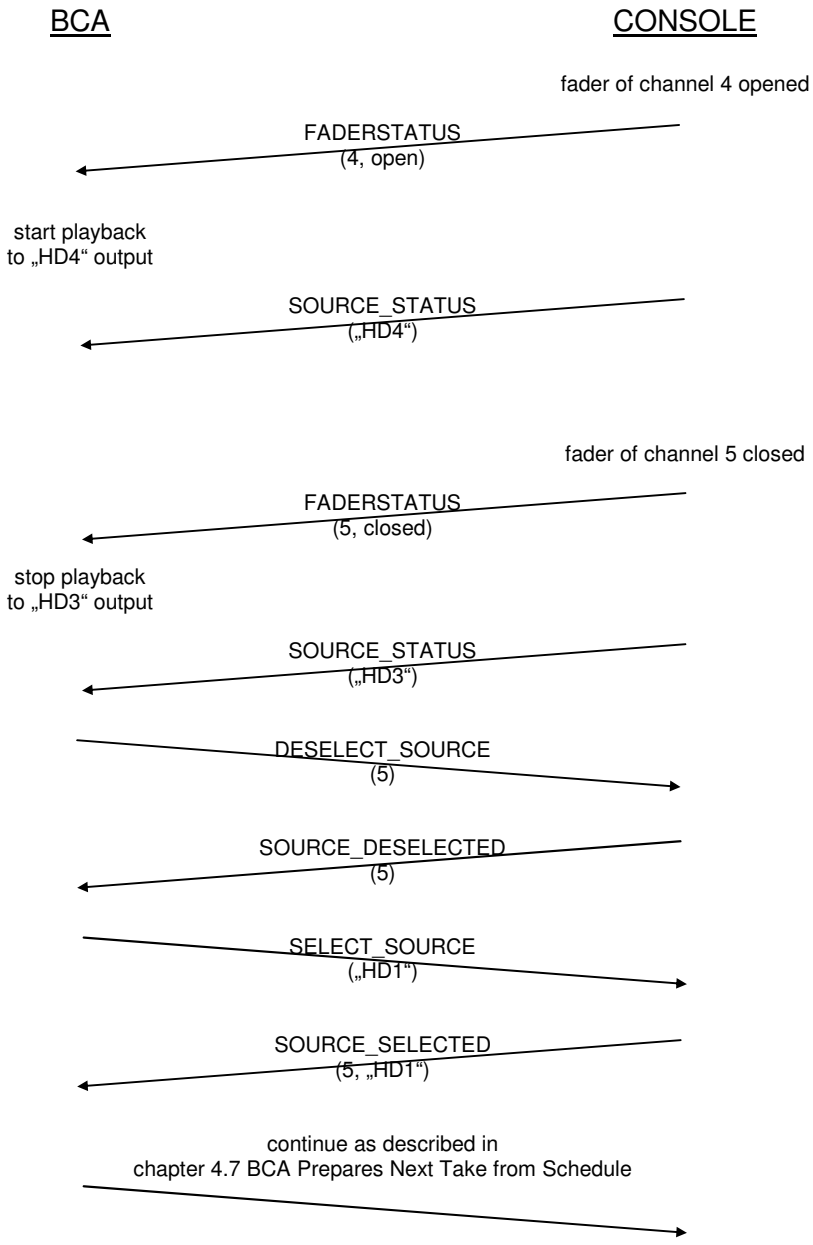
4.7 BCA Prepares Next Take from Schedule



The SET_NEXT_BUTTONLIGHT telegram is sent by the BCA only, if the corresponding take is the next within schedule.

4.8 Manual Crossfade to Next Take from Schedule

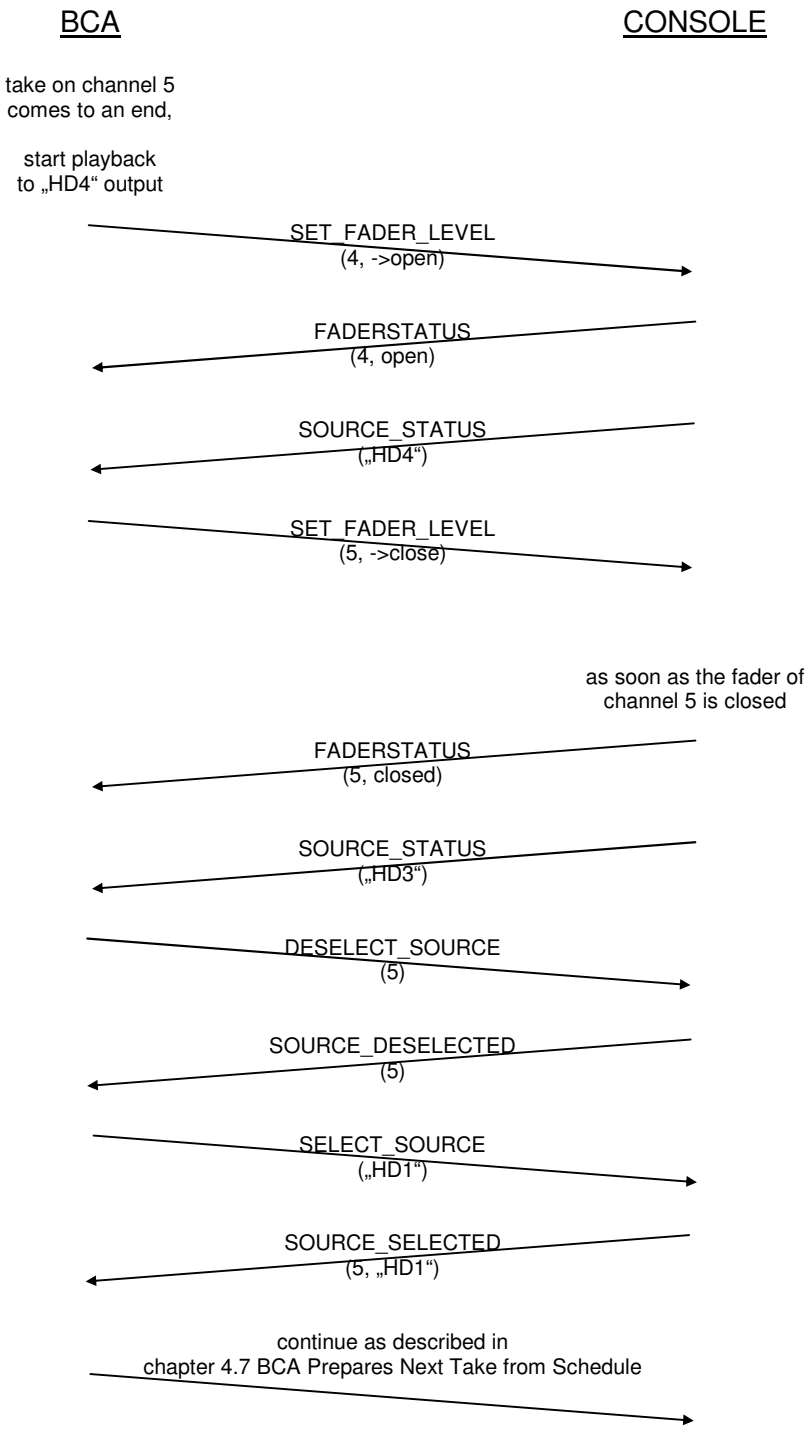
Open fader of channel 4, which was previously prepared (chapter 4.7 BCA Prepares Next Take from Schedule) and close fader of channel 5:



As the next take is started manually by opening a „ready“ fader, the BCA must not send a SET_FADER_LEVEL telegram. In this case the crossfade is controlled manually. After the fader of a playing source is closed, the BCA stops playback and the next take will be prepared.

4.9 Automatic Crossfade to Next Take from Schedule

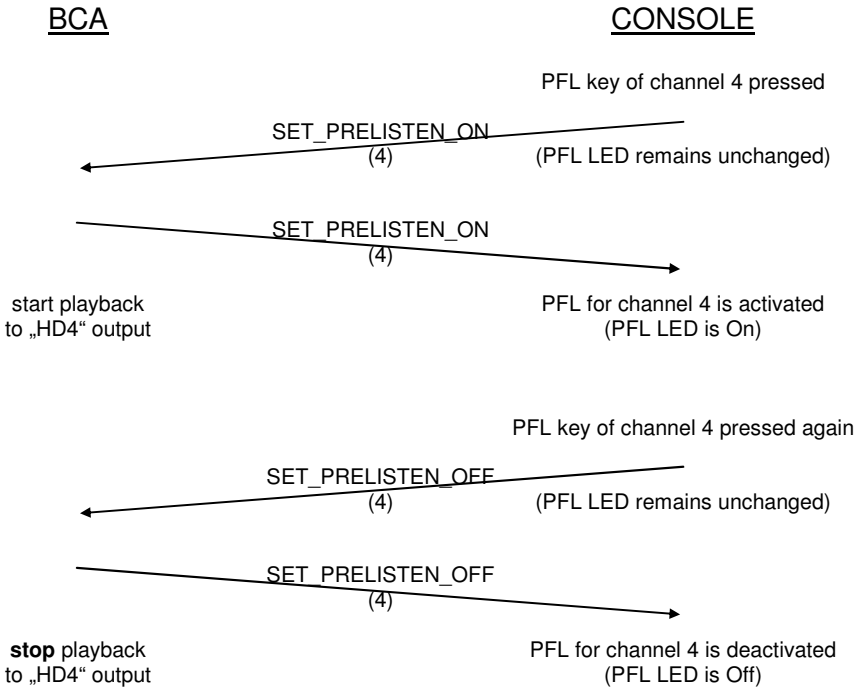
The BCA opens channel 4, which was previously prepared (chapter 4.7 BCA Prepares Next Take from Schedule) and closes channel 5 automatically at the end of the take playing to channel 5 („HD3“ output):



4.10 Prelistening

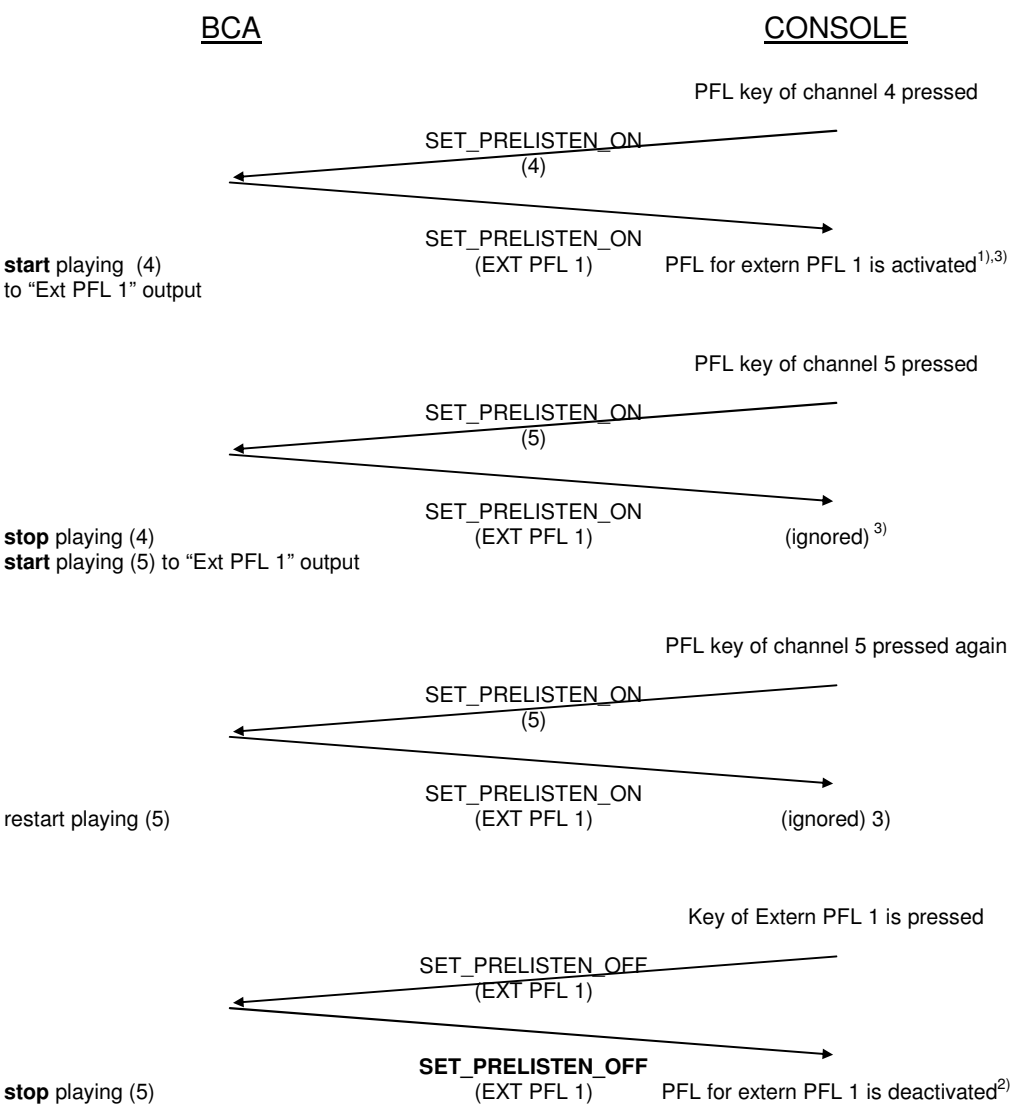
Generally, PFL is activated by pressing a channel PFL key on the On-Air 3000/2500/1500. It is deactivated either by pressing the PFL key again, or the key of an extern PFL (depending on the context).

- Channel PFL is controlled from the Console:

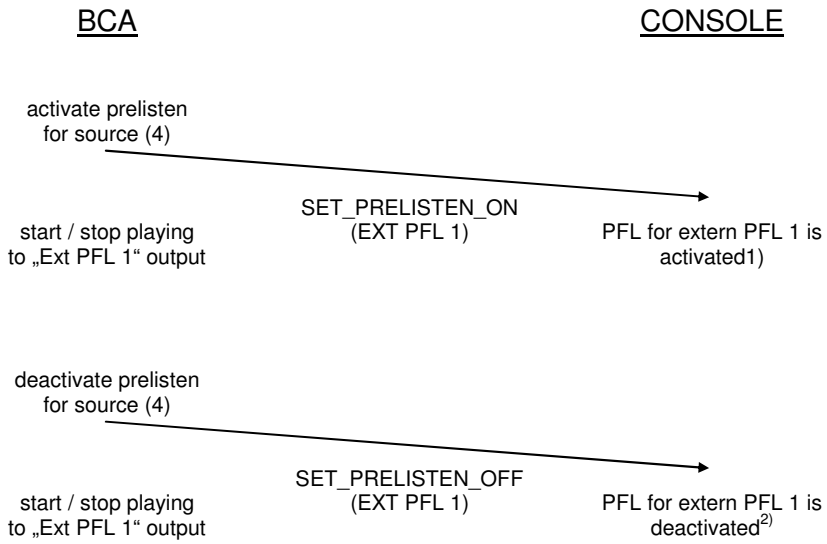


Note: Only Channel PFL can be activated from the Console. Activation of pre-listening using the EXT PFL1/2 button is not supported, even if the BCA has selected EXT PFL.

- Channel PFL is activated on the Console, and the BCA uses extern PFL to playout:



- Prelisten is activated / deactivated locally on BCA:



1) Extern PFL LED is ON
2) Extern PFL LED is OFF
3) The LED of the channel remains **OFF**

5 TELEGRAM DESCRIPTION

This chapter defines the syntax of each telegram from/to BCA. There is no detailed description of the processing within the console on reception of a telegram. This is part of the process description in Software Design Description [SDD].

Referring to chapter 4 Rahmenprotokoll of [MONPRO], the following description defines the part of a telegram called „Werte“.

5.1 System

5.1.1 GET_DEVSTATUS

GET_DEVSTATUS	BCA->CONS	0x01	

GET_DEVSTATUS	CONS->BCA	0x01	

The GET_DEVSTATUS telegram is sent every 10s to BCA.

5.1.2 DEVSTATUS

DEVSTATUS	BCA->CONS	0x02	Code

The DEVSTATUS report is received to determine, if a BCA is available. There are no errorcodes defined by/for the BCA.

Code: 0x00: ignored
|
0xFF ignored

DEVSTATUS	CONS->BCA	0x02	Code

The DEVSTATUS telegram is reported to the BCA on request (GET_DEVSTATUS). It can also be sent on reception of a telegram to indicate invalid arguments.

Code:
- 0x00: no error
- 0x01: invalid FaderNr. FaderNr > total number of strip channels on console or FaderNr denotes a virtual fader
- 0x02: invalid command, is sent, if the command is not defined within the list of MONITORA Protocol commands [MONPROT]. MONITORA Protocol commands which are not supported by the On-Air 3000/2500/1500 are ignored and do not cause any DEVSTATUS telegram.
- 0x03: FaderNr not selected previously
- 0x04: invalid SumBusNr. SumBusNr addresses a ∑-bus, which is not supported by the product
  (OnAir2500 doesn't support AUX3..4, N-X9..48 and PRG B)
  (OnAir1500 doesn't support AUX1..4, N-X5..48 and PRG B)
- 0x05: invalid AuxNr. AuxNr addresses a aux bus, which is not supported by the product
  (OnAir2500 doesn't support AUX3..4)
  (OnAir1500 doesn't support AUX1..4)

Note: DEVSTATUS Code = invalid FaderNr, invalidBusNr and invalid AuxNr are reported if a MONITORA command addresses a fader or ∑-bus, which doesn't exist (DNet tree).
There is no DEVSTATUS message sent in response to a MONITORA command, which addresses a fader or ∑-bus, which is not accessible due to limitations like Desk Resource Definition (A/B Desk) or unlicensed options (e.g. 5.1).

5.1.3 DESK_STATUS

DESK_STATUS	CONS->BCA	0x29	Code

The DESK_STATUS is sent to the BCA after power up.

Code:
- 0x01: desk reset, all sources deselected
- 0x02: console started.

Note: Incoming messages are neither accepted nor acknowledged until DESK_STATUS 0x02 is sent.

5.2 Source Management

5.2.1 SELECT_SOURCE

SELECT_SOURCE	BCA->CONS	0x07	Name

Name: char[8]: The BasicLabel of the LogicalInput representing the source.

When receiving a SELECT_SOURCE command, the OnAir3000/2500/1500 searches for the LogicalInput, which BasicLabel corresponds to the specified Name.

According to the definition in the *cab_interfaces.ini* – file, searching is accomplished in the following priority order:

1. *sourceMapping* if a *sourceMapping* is defined in the *cab_interfaces.ini* – file, the OnAir3000/2500/1500 doesn't search in LogicalInputs for the specified Name. The Name is searched within the specified *sourceMapping* which defines the LogicalInput associated to a certain name.
2. *desk_assignment* if a desk assignment is defined in the *cab_interfaces.ini* – file and it is not equal "None", the OnAir3000 searches in LogicalInputs and Extern PFLs within the resources of the specified desk for the specified Name.
3. otherwise the OnAir 3000/2500/1500 searches in all LogicalInputs and Extern PFLs for the specified Name

If the LogicalInput is not yet on fader, the OnAir3000/2500/1500 assigns it to the next free strip channel.

Searching for a free strip channels is accomplished according to the *location* "ControlRoom" or "Studio", specified in the *cab_interfaces.ini*. The desk assignment is ignored !

Note: A source can be selected only by one CAB. FaderNr=0x00 is returned (SOURCE_SELECTED) when a CAB tries to select an already selected source.

5.2.2 SOURCE_SELECTED

SOURCE_SELECTED	CONS->BCA	0x08	Name, FaderNr

The SOURCE_SELECTED telegram is reported to the BCA in two cases

- in response to a SELECT_SOURCE telegram
- spontaneously, if a source is re-assigned to any strip channel, which was previously deselected by the CONSOLE as it has been removed from a strip channel. SOURCE_SELECTED is not sent in case, where the source was deselected by the CAB and removed from the strip channel as a consequence.

The returned FaderNr does not necessarily correspond to the fader numeration on the CONSOLE. The FaderNr for a source remains the same as long as the source is selected. No reports are required, if channels are swapped.

If the selected source is an external PFL input, virtual fader numbers are returned. The only valid operations on those FaderNr are SET_PRELISTEN_ON/SET_PRELISTEN_OFF.

Name:	char[8]:	The BasicLabel of the LogicalInput representing the source. If a *sourceMapping* is defined in the *cab_interfaces.ini* – file, the Label used in the *sourceMapping* is indicated here.
FaderNr:	0x00:	source not assigned
	0x01:	channel 1
	|	
	0x30:	channel 48
	0xFF:	EXT PFL 1
	0xFE:	EXT PFL 2

5.2.3 DESELECT_SOURCE

DESELECT_SOURCE	BCA->CONS	0x09	FaderNr

FaderNr: 0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

The DESELECT_SOURCE command deselects a previous selected logical input from the assigned FaderNr (see SELECT_SOURCE). As a consequence, the status of FADER_READY and CHANNEL_BUTTONLIGHT is reset.

Optionally, the Logical Input will be removed from the corresponding fader strip.
The behaviour can be defined in cab_interface.ini:

DeselectSource REMOVE The LogicalInput will be removed from strip channel

DeselectSource KEEP The LogicalInput will only be deassigned from CAB's FaderNr but will be kept on strip channel. This is default, and is activated if the entry is missing.

If the command proceeds successfully, the SOURCE_DESELECTED telegram will be responded to CAB.

Note:

If this LogicalInput is OnAir or Locked, it will be disconnected from the FaderNr but will then remain on strip channel until it is switched to OffAir or Unlocked. Then, the command also responses successfully with SOURCE_DESELECTED.

These UserWarnings appear if the input is onair / locked:
6001 - "Pending Routing. The routing of channel '...' on '...' is not yet changed. Input '...' is on-air."

6002 - "Routing failure. The routing of channel '...' on '...' could not be changed. Channel '...' is locked."

5.2.4 SOURCE_DESELECTED

SOURCE_DESELECTED	CONS->BCA	0x0A	FaderNr

The SOURCE_DESELECTED telegram is reported to the BCA on DESELECT_ SOURCE telegram, or if a source has been removed from a strip channel. No reports are sent if channels are swapped.

FaderNr: 0x01: channel 1
|
0x30: channel 48

5.2.5 RESET (no longer supported from V2.2 or higher)

RESET	BCA->CONS	0x72	

Loads the initial snapshot: All sources will be deselected and the console is set to its initial state.

5.3 Routing

5.3.1 SET_SAS_INPUTROUTING

SET_SAS_INPUTROUTING	BCA->CONS	0x0F	FaderNr, InputLine

Assignes the specified InputLine as physical source to the LogicalInput refered by the specified FaderNr.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

InputLine:
0x00: Virtual Ground
0x01: HD Link In 1
|
0xFE: HD Link In 254
0xFF: ignored

Note:

- InputLine denotes the left channel (L).
  Except in case of Virtual Ground (0x00) the InputLine of the additional channels of a LogicalInput of the format Stereo or 5.1 is assigned as follows:
  Stereo: R HD Link In = L HD Link In + 1
  5.1: R HD Link In = L HD Link In + 1
  C HD Link In = L HD Link In + 2
  L_{fe} HD Link In = L HD Link In + 3
  L_s HD Link In = L HD Link In + 4
  R_s HD Link In = L HD Link In + 5
  If at least one of the required HD Link Ins is out of range (e.g. the required HD Link In for R_s is 97 but only one DSP Card is installed) UserWarning 8101: “CAB (Monitora protocol), SET_SAS_INPUTROUTING failed: HD-Link signal ID out of range. InputLine can not be routed." is created and no physical source is assigned to the LogicalInput refered by the specified FaderNr.
- The SET_SAS_INPUTROUTING telegram doesn’t affect the source selection!
- In case of the OnAir3000, the number of HD Link inputs depends on the configuration of the core. There are 96 inputs per installed DSP card.

  For the OnAir2500/1500 there are always 96 HD Links are available.

  Invalid HD Link Ins will be ignored.

5.3.2 GET_SAS_INPUTROUTING

GET_SAS_INPUTROUTING	BCA->CONS	0x05	FaderNr

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

5.3.3 SAS_INPUTROUTING

SAS_INPUTROUTING	CONS->BCA	0x06	FaderNr, InputLine

The SAS_INPUTROUTING telegram is only reported to the BCA on request. It provides the physical source of the first signal of the LogicalInput refered by the specified FaderNr.

See also Config Tool: Config→LogicalInputs→Source (left).

FaderNr:
0x01: channel 1
|
0x30: channel 48

InputLine:
0x00: Virtual Ground
0x01: HD Link In 1
|
0xFE: HD Link In 254
0xFF: undefined

Note:

- InputLine denotes the first signal of the LogicalInput.
- Physical HD Links > 254 will be reported as undefined.
- In case where the LogicalInput is a I/O Sharing NetConsumer, undefined is reported

.

5.3.4 SET_ZI (no longer supported from V2.0 or higher)

SET_ZI	BCA->CONS	0x2A	FaderNr, ZiInfo

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

ZiInfo:
0x01: music, channel is assigned to program bus A only
0x02: speech, channel is assigned to program bus B only
0x03: ignored
|
0xFF: ignored

5.4 Channel Control

5.4.1 SET_FADER_AUX_MODE

SET_FADER_AUX_MODE	BCA->CONS	0x28	FaderNr, AuxNr, AuxMode

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

AuxNr:
0x01: aux send 1[1]
0x02: aux send 2[1]
0x03: aux send 3[2]
0x04: aux send 4[2]
0x05: ignored
|
0xFF: ignored

AuxMode:
0x00: OFF, doesn't affect PF/AF mode
0x01: ON, AF
0x02: ON, PF
0x03: ignored
|
0xFF: ignored

Note: The AuxNr is a relative number considering the desk resource definition of the *desk_assignment* defined in the *cab_interfaces.ini* – file.

[1] Ignored for OnAir1500
[2] Ignored for OnAir1500 and OnAir2500

E.g. aux send 1 on the secondary desk may be mapped to aux send 3 within the core.

5.4.2 SET_FADER_LEVEL

SET_FADER_LEVEL	BCA->CONS	0x0E	FaderNr, Level, Time

The command is ignored, in case of an OnAir3000/2500/1500 equipped with motorized faders, as long as the fader is touched.

The channel is automatically set to ON (channel ON/OFF status of the On-Air 3000/2500/1500), if the fader is opened by SET_FADER_LEVEL.

FaderNr:
- 0x01: channel 1
- |
- 0x30: channel 48
- 0x31: ignored
- |
- 0xFF: ignored

Level: signed: 0xA6 ... 0x0A = -90dB ... +10dB
<-90dB = -90dB->fader closed
> +10dB = +10dB

Time: unsigned short:
0x0000 ... 0xFFFF, 1 unit is 40ms

5.4.3 GET_FADER_LEVEL

GET_FADER_LEVEL	BCA->CONS	0x1E	FaderNr

FaderNr: 0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

5.4.4 FADER_LEVEL

FADER_LEVEL	CONS->BCA	0x1F	FaderNr, Level

The FADER_LEVEL telegram reports the audio level (DSP level). This could be another level than the physical fader position (auto take-over mode).

By default the telegram is only reported to the BCA on request. This is the behaviour as defined in [MONPROT]. The behaviour can be changed in the *cab_interfaces.ini* file by changing the option FaderLevelMode from ON REQUEST to SPONTANEOUSLY. Then FADER_LEVEL telegrams are also sent spontaneously after a fader level change.

FaderNr: 0x01: channel 1
|
0x30: channel 48

Level: signed: 0xA6 ... 0x0A = -90dB ... 10dB
0xA6 = fader closed

Note: If the real fader level is not an integer, it is rounded upwards to the next integer (e.g. if the level is –9.9 dB, the returned FADER_LEVEL will be –9 dB, +1.1 dB will be rounded to + 2dB)

5.4.5 GET_FADERSTATUS

GET_FADERSTATUS	BCA->CONS	0x03	FaderNr

FaderNr: 0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

5.4.6 FADERSTATUS

FADERSTATUS	CONS->BCA	0x04	FaderNr, FaderStatus

The FADERSTATUS telegram can be driven by two different causes

- The status of the source, it's bus assignment and on-air conditions
- The output level of a predefined GPIO- or Custom Logic LevelProducer

By default, the FADERSTATUS telegram is source driven. It is the behaviour as defined in [MONPROT]. The user can add Logic Assignments to the *cab_interfaces.ini* file for each source in order to drive the FADERSTATUS telegram by the result of any GPIO- or Custom Logic LevelProducer.

5.4.6.1 FADERSTATUS is Source driven

The FADERSTATUS is reported spontaneously by the On-Air 3000/2500/1500 on change of:

- audio level
- channel ON
- channel assignment to program bus A, B, 5.1A, 5.1B
- channel assignment to record bus
- sum fader of the program bus
- sum fader of the record bus
- on-air relevant of prog bus A / B or record bus

FaderNr: 0x01: channel 1
|
0x30: channel 48

FaderStatus: 0x00: fader closed, audio level -90dB
0x01: fader open, audio level >-90dB and channel ON
0x02: on-air, audio level >-90dB (fader open), channel ON, channel assigned to program/record bus and corresponding sum fader open[*1)]

[*1)] (program bus A/B/5.1A/5.1B or record bus must be OnAirRelevant)

When the fader is being closed, the FaderStatus "fader closed" is sent even if the FaderStatus was "fader closed" before. (This is for the Digimedia function "ChannelOn on FaderClose".)

5.4.6.2 FADERSTATUS is LevelProducer Driven

If a Logic Assignment is defined for a certain source, the FADERSTATUS is reported spontaneously by the On-Air 3000/2500/1500 on every change of the specified LevelProducer.

FaderNr: 0x01: channel 1
|
0x30: channel 48

FaderStatus: 0x02: if the output level of the specified LevelProducer's is high
0x01: not supported
0x00: if the output level of the specified LevelProducer's is low

A LogicAssignment is defined in the *cab_interfaces.ini* by adding the following line:

`LogicAssignment: FADERSTATUS "Input Index" LevelProducer`

where

`Input Index`: the index of the of the LogicalInput: 1..255

`LevelProducer`: any local GPIO- or Custom Logic Level Producer like:
GPInput1..n
GPOutputFunction1..n
AND1..n
OR1..n
XOR1..n
NOT1..n

5.4.7 SET_FADER_DISPLAY2

SET_FADER_DISPLAY2	BCA->CONS	0x12	FaderNr, Text

Set the text to be displayed above the fader. This text will remain until it's overwritten or reset (e.g. on routing changes). The display element can show 8 characters at a time.

FaderNr: 0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Text: char[var]: variable literal according to [MONPROT]. Text longer than 8 will be cut to 8 characters.

Note: If Text has length 0, the display text is reset to its default value (BasicLabel).

5.4.8 SET_FADER_INPUT_GAIN

SET_FADER_INPUT_GAIN	BCA->CONS	0x0B	FaderNr, Gain

The SET_FADER_INPUT_GAIN telegram controls the DSP parameter “cal” (for mic and line inputs).

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Gain: signed: 0xEE ... 0x12 = -18dB ... 18dB for all inputs
< -18dB = -18dB
> 18dB = 18dB

5.4.9 GET_FADER_INPUT_GAIN

GET_FADER_INPUT_GAIN	BCA->CONS	0x2B	FaderNr

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

5.4.10 FADER_INPUT_GAIN

FADER_INPUT_GAIN	CONS->BCA	0x2C	FaderNr, Gain

The FADER_INPUT_GAIN telegram reports the value of the DSP parameter “cal” (for mic and line inputs). It is only reported to the BCA on request.

FaderNr:
0x01: channel 1
|
0x30: channel 48

Gain: signed: 0xEE ... 0x12 = -18dB ... 18dB for all inputs

Note: If the real value of the cal parameter is not an integer, it is rounded updwards to the next integer (e.g. if cal is –9.5 dB, the returned FADER_LEVEL will be –9 dB, +1.5 dB will be rounded to + 2dB)

5.4.11 SET_PRELISTEN_ON

SET_PRELISTEN_ON	BCA->CONS	0x16	FaderNr

FaderNr:
0x01: activate PFL of channel 1
|
0x30: activate PFL of channel 48
0x31: ignored
|
0xFD: ignored
0xFF: activate EXT PFL 1
0xFE: activate EXT PFL 2

The PFL bus on which the channel or EXT PFL is assigned to depends on the *location* specified in the *cab_interfaces.ini*. It is either “ControlRoom” or “Studio”.

SET_PRELISTEN_ON	CONS->BCA	0x16	FaderNr

The SET_PRELISTEN_ON telegram is sent to the BCA spontaneously by the On-Air 3000/2500/1500, if the PFL/CUE key of the corresponding channel is pressed while PFL/CUE function is OFF.

FaderNr:
0x01: channel 1
|
0x30: channel 48

5.4.12 SET_PRELISTEN_OFF

SET_PRELISTEN_OFF	BCA->CONS	0x17	FaderNr

FaderNr:
0x01: deactivate PFL of channel 1
|
0x30: deactivate PFL of channel 48
0x31: ignored
|
0xFD: ignored
0xFF: deactivate EXT PFL 1
0xFE: deactivate EXT PFL 2

The PFL bus from which the channel or EXT PFL is removed depends on the *location* specified in the *cab_interfaces.ini*. It is either “ControlRoom” or “Studio”.

SET_PRELISTEN_OFF	CONS->BCA	0x17	FaderNr

The SET_PRELISTEN_OFF telegram is sent to the BCA spontaneously by the On-Air 3000/2500/1500, if the PFL/CUE key of the corresponding channel is pressed while PFL/CUE function is ON.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0xFF: EXT PFL 1
0xFE: EXT PFL 2

5.4.13 SET_NEXT_BUTTONLIGHT

SET_NEXT_BUTTONLIGHT	BCA->CONS	0x26	FaderNr, Status

The SET_NEXT_BUTTONLIGHT telegram is used to indicate the next take from schedule. The most recent FaderNr overwrites previous, as only one channel can be the next.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Status:
0x00: clear next indication of the channel defined by FaderNr
0x01: set next indication of the channel defined by FaderNr
|
0xFF

5.4.14 SET_FADER_START

SET_FADER_START	BCA->CONS	0x2D	FaderNr, Status

The SET_FADER_START telegram is used to indicate a channel as ready for playback. More then one channel can be ready.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Status:
0x00: not ready for playback indication
0x01: ready for playback indication (READY LED illuminated)
|
0xFF

5.4.15 SET_FADER_READY

SET_FADER_READY	BCA->CONS	0x15	FaderNr

The SET_FADER_READY telegram is used to indicate a channel as ready for playback. The READY LED is illuminated.

More then one channel can be ready.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

5.4.16 RESET_FADER_READY

RESET_FADER_READY	BCA->CONS	0x20	FaderNr

The RESET_FADER_READY telegram is used to indicate a channel as not ready for playback. The READY LED is switched off.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

5.4.17 SET_CHANNEL_BUTTONLIGHT

SET_CHANNEL_BUTTONLIGHT	BCA->CONS	0x1A	FaderNr, ButtonNr, Status

The SET_CHANNEL_BUTTONLIGHT telegram controls the button light of the specified fader. The button illumination may be Yellow, Light Red (orange) or Dark Red.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

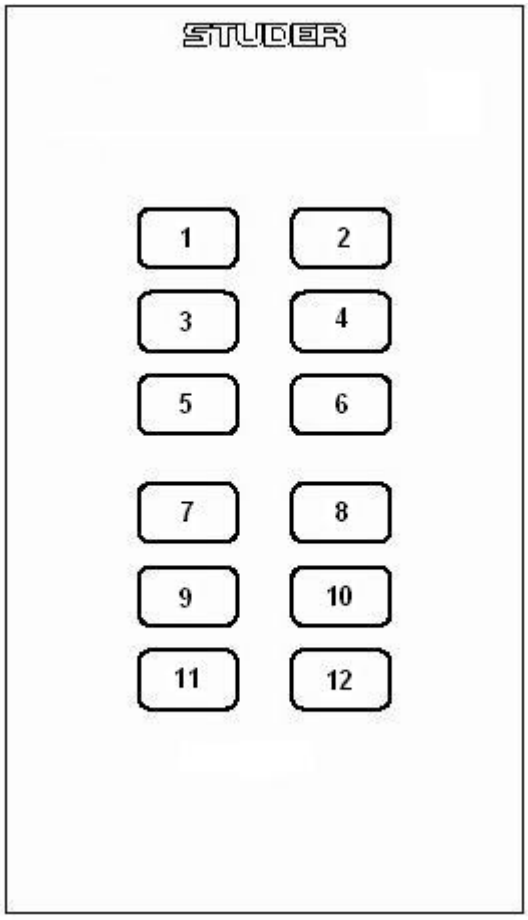
ButtonNr:
0x01: CABChannelButtonLight 1
|
0x02: CABChannelButtonLight 2
0x03: ignored
|
0xFF: ignored

Status:
0x00: turns OFF the specified button light
0x01: ignored
0x02: ignored
0x03: Yellow
0x04: Light Red
0x05: Dark Red
0x06: ignored
|
0xFF ignored

5.5 Remote Control

Up to 48 buttons on the desk surface can be used to control the BCA or their LEDs can reflect any state of the BCA.

By default, button numbers 1..12 are assigned to the CART box as follows :



5.5.1 BUTTON_PUSHED

BUTTON_PUSHED	CONS->BCA	0x0C	ButtonNr

The BUTTON_PUSHED telegram is sent spontaneously to indicate that the corresponding button was pressed on the desk.

ButtonNr:
0x01: button 1
|
0x30: button 48
0x31: not used
|
0xFF: not used

5.5.2 BUTTON_RELEASED

BUTTON_RELEASED	CONS->BCA	0x0D	ButtonNr

The BUTTON_ RELEASED telegram is sent spontaneously to indicate that the corresponding button was released on the desk.

ButtonNr:
- 0x01: button 1
- |
- 0x30: button 48
- 0x31: not used
- |
- 0xFF: not used

5.5.3 SET_BUTTON_LIGHT

SET_BUTTON_LIGHT	BCA->CONS	0x14	ButtonNr, Status

Using the SET_BUTTON_LIGHT telegram, the BCA is able to control the illumination up to 48 buttons on the desk surface.

ButtonNr:
- 0x01: button 1
- |
- 0x30: button 48
- 0x31: ignored
- |
- 0xFF: ignored

Status:
- 0x00: LED OFF
- 0x01: LED illuminated
- |
- 0xFF LED illuminated

5.6 Billing

5.6.1 SET_PROTOCOL

SET_PROTOCOL	BCA->CONS	0x23	Status

As soon as SET_PROTOCOL is activated, the On-Air 3000/2500/1500 sends spontaneously a SOURCE_STATUS telegram for each LogicalInput once. In the following, it reports the SOURCE_STATUS spontaneously on change.

Status: 0x00: OFF, the On-Air 3000/2500/1500 doesn't send any SOURCE_STATUS telegram
0x01: ON, the On-Air 3000/2500/1500 sends SOURCE_STATUS telegrams
| spontaneously on change of source status.
0xFF:

5.6.2 SOURCE_STATUS

SOURCE_STATUS	CONS->BCA	0x24	Name, Status

The SOURCE_STATUS telegram can be driven by two different causes

- The status of the source, it's bus assignment and on-air conditions
- The output level of a predefined GPIO- or Custom Logic LevelProducer

By default, the SOURCE_STATUS telegram is source driven. It is the behaviour as defined in [MONPROT]. The user can add Logic Assignments to the *cab_interfaces.ini* file for each source in order to drive the SOURCE_STATUS telegram by the result of any GPIO- or Custom Logic LevelProducer.

5.6.2.1 SOURCE_STATUS is Source Driven

If no Logic Assignment is defined for a certain source (default), its SOURCE_STATUS is reported spontaneously by the On-Air 3000/2500/1500, if SET_PROTOCOL is enabled, on every change of:

- audio level
- channel ON
- channel assignment to program bus A , B, 5.1A or 5.1B
- channel assignment to record bus
- sum fader of the program bus
- sum fader of the record bus
- on-air input signal
- on-air relevant of prog bus A / B or record bus
- billing is enabled

Name:	char[8]:	The BasicLabel of the LogicalInput representing the source. If a *sourceMapping* is defined in the *cab_interfaces.ini* – file, the Label used in the *sourceMapping* is indicated here.
Status:	0x02:	ON-AIR, audio level >-128dB (fader op en), channel ON, channel assigned to program/record bus[1], corresponding sum fader open and on-air input signal active
	0x01:	ON, same condition, but no on-air signal active
	0x00:	OFF, otherwise

5.6.2.2 SOURCE_STATUS is LevelProducer driven

If a Logic Assignment is defined for a certain source, its SOURCE_STATUS is reported spontaneously by the On-Air 3000/2500/1500 on every change of the specified LevelProducer, if SET_PROTOCOL is enabled.

Name:	char[8]:	The BasicLabel of the LogicalInput representing the source. If a *sourceMapping* is defined in the *cab_interfaces.ini* – file, the Label used in the *sourceMapping* is indicated here.
Status:	0x02:	ON-AIR, if the output level of the specified LevelProducer's is high
	0x01:	not supported
	0x00:	OFF, if the output level of the specified LevelProducer's is low

A LogicAssignment is defined in the *cab_interfaces.ini* by adding the following line:

`LogicAssignment: SOURCE_STATUS "Input Index" LevelProducer`
where

`Input Index`:	the index of the of the LogicalInput: 1..255
`LevelProducer`:	any local GPIO- or Custom Logic Level Producer like: GPInput1..n GPOutputFunction1..n AND1..n OR1..n XOR1..n NOT1..n

[1] program bus A/B/5.1A/5.1B or record bus must be OnAirRelevant

5.7 Extended Commands

5.7.1 SET_TIME

SET_TIME	BCA->CONS	0x8000	Hours, Minutes, Seconds

Used to set the local time of the OnAir3000/2500/1500's watch.

Successful external time synchronization over MONITORA is indicated on the OnAir3000/2500/1500 Main Screen, if at least every n seconds a SET_TIME message is received.
"n" is the *timeSyncTimeout* defined in the *cab_interfaces.ini* – file.

Hours: byte: 0x00 ... 0x17 = 00:mm:ss ... 23:mm:ss
0x18 ... 0xFF = 23:mm:ss

Minutes: byte: 0x00 ... 0x3B = hh:00:ss ... hh:59:ss
0x3C ... 0xFF = hh:59:ss

Seconds: byte: 0x00 ... 0x3B = hh:mm:00 ... hh:mm:59
0x3C ... 0xFF = hh:59:ss

Note: The time to be set should be the local time of the BCA (don't worry about your timezone).

5.7.2 SET_DATE

SET_DATE	BCA->CONS	0x8001	Day, Month, Year

Day:
0x00: 1. day of month
0x01: 1. day of month
|
0x1F: 31. day of month
0x20: 31. day of month
|
0xFF

Month:
0x00: January
0x01: January
|
0x0C: December
0x0D: December
|
0xFF

Year: byte[2]: 0x0000 ... 0x07CB = undefined
0x07CC ... 0x0830 = 1996 ... 2037
0x0831 ... 0xFFFF = 2037

Note: The date to be set should be the local date of the BCA (don't worry about your timezone).

5.7.3 SET_CHANNEL_ON

SET_CHANNEL_ON	BCA->CONS	0x8002	FaderNr, Staus

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Status:
0x00: Channel OFF
0x01: Channel ON
|
0xFF:

5.7.4 RESET_FADER_LEVEL

RESET_FADER_LEVEL	BCA->CONS	0x800D	FaderNr, Time

Brings the audio level into line with the physical fader position and leaves the auto take-over mode.

The channel is automatically set to ON (channel ON/OFF status of the On-Air 3000/2500/1500), if the fader is opened.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Time: ignored

5.7.5 SET_FADER_LEVEL_ONLY

SET_FADER_LEVEL_ONLY	BCA->CONS	0x800E	FaderNr, Level, Time

The command is ignored, in case of an OnAir3000/2500/1500 equipped with motorized faders, as long as the fader is touched.

FaderNr: 0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Level: signed: 0xA6 ... 0x0A = -90dB ... +10dB
<-90dB = -90dB->fader closed
> +10dB = +10dB

Time: unsigned short:
0x0000 ... 0xFFFF, 1 unit is 40ms

5.7.6 RESET_FADER_LEVEL_ONLY

RESET_FADER_LEVEL_ONLY	BCA->CONS	0x800F	FaderNr, Time

Brings the audio level into line with the physical fader position and leaves the auto take-over mode.

FaderNr: 0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Time: ignored:

5.7.7 GET_CHANNEL_ON

GET_CHANNEL_ON	BCA->CONS	0x8012	FaderNr

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

5.7.8 CHANNEL_ON

CHANNEL_ON	CONS->BCA	0x8013	FaderNr, Staus

The CHANNEL_ON telegram is only reported to the BCA on request.

FaderNr:
0x01: channel 1
|
0x30: channel 48
0x31: ignored
|
0xFF: ignored

Status:
0x00: Channel OFF
0x01: Channel ON

5.7.9 RESET_SUM_FADER_LEVEL

RESET_SUM_FADER_LEVEL	BCA->CONS	0x801D	SumBusNr, Time

Brings the audio level of the corresponding sum bus into line with its physical fader position and leaves the auto take-over mode.

SumBusNr:
- 0x01: Aux 1[1]
- 0x02: Aux 2[1]
- 0x03: Aux 3[2]
- 0x04: Aux 4[2]
- 0x10: N-X 1
- |
- 0x13: N-X 4
- 0x14: N-X 5[1]
- |
- 0x17: N-X 8[1]
- 0x18: N-X 9[2]
- |
- 0x1F: N-X 16[2]
- 0x30: reserved for Audition
- 0x40: sum program A
- 0x41: sum program B[2]
- 0x42: sum program 5.1A[2]
- 0x43: sum program 5.1B[2]
- 0x50: sum record
- 0x60: N-X 17[2]
- |
- 0x7F: N-X 48[2]
- 0x80: ignored
- |
- 0xFF: ignored
- 0x00: ignored

(and all SumBusNr between are also ignored)

Time: ignored

Note: The SumBusNr is a relative number considering the desk resource definition of the *desk_assignment* defined in the *cab_interfaces.ini* – file.
E.g. sum program A on the secondary desk may be mapped sum program B within the core.

[1] Ignored for OnAir1500
[2] Ignored for OnAir1500 and OnAir2500

5.7.10 SET_SUM_FADER_LEVEL

SET_SUM_FADER_LEVEL	BCA->CONS	0x801E	SumBusNr, Level, Time

The command is ignored, in case of an OnAir3000/2500/1500 equipped with motorized faders, as long as the correpsonding ∑-fader is touched.

Sets the audio level of the corresponding sum bus.

SumBusNr:
- 0x01: Aux 1[1]
- 0x02: Aux 2[1]
- 0x03: Aux 3[2]
- 0x04: Aux 4[2]
- 0x10: N-X 1
- |
- 0x13: N-X 4
- 0x14: N-X 5[1]
- |
- 0x17: N-X 8[1]
- 0x18: N-X 9[2]
- |
- 0x1F: N-X 16[2]
- 0x30: reserved for Audition
- 0x40: sum program A
- 0x41: sum program B[2]
- 0x42: sum program 5.1A[2]
- 0x43: sum program 5.1B[2]
- 0x50: sum record
- 0x60: N-X 17[2]
- |
- 0x7F: N-X 48[2]
- 0x80: ignored
- |
- 0xFF: ignored
- 0x00: ignored

(and all SumBusNr between are also ignored)

Level: signed: 0xA6 ... 0x0A = -90dB ... +10dB
<-90dB = -90dB->fader closed
> +10dB = +10dB

Time: unsigned short:
0x0000 ... 0xFFFF, 1 unit is 40ms

Note: The SumBusNr is a relative number considering the desk resource definition of the *desk_assignment* defined in the *cab_interfaces.ini* – file.
E.g. sum program A on the secondary desk may be mapped sum program B within the core.

[1] Ignored for OnAir1500
[2] Ignored for OnAir1500 and OnAir2500

5.7.11 GET_SUM_FADER_LEVEL

GET_SUM_FADER_LEVEL	BCA->CONS	0x802E	SumBusNr

SumBusNr:
0x01: Aux 1[1]
0x02: Aux 2[1]
0x03: Aux 3[2]
0x04: Aux 4[2]
0x10: N-X 1
|
0x13: N-X 4
0x14: N-X 5[1]
|
0x17: N-X 8[1]
0x18: N-X 9[2]
|
0x1F: N-X 16[2]
0x30: reserved for Audition
0x40: sum program A
0x41: sum program B[2]
0x42: sum program 5.1A[2]
0x43: sum program 5.1B[2]
0x50: sum record
0x60: N-X 17[2]
|
0x7F: N-X 48[2]
0x80: ignored
|
0xFF: ignored
0x00: ignored
(and all SumBusNr between are also ignored)

Note: The SumBusNr is a relative number considering the desk resource definition of the *desk_assignment* defined in the *cab_interfaces.ini* – file.
E.g. sum program A on the secondary desk may be mapped sum program B within the core.

[1] Ignored for OnAir1500
[2] Ignored for OnAir1500 and OnAir2500

5.7.12 SUM_FADER_LEVEL

SUM_FADER_LEVEL	CONS->BCA	0x802F	SumBusNr, Level

The SUM_FADER_LEVEL telegram is only reported to the BCA on request. It reports the audio level (DSP level) of the desired sum bus. This could be another level than the physical fader position (auto take-over mode).

SumBusNr:
- 0x01: Aux 1[1]
- 0x02: Aux 2[1]
- 0x03: Aux 3[2]
- 0x04: Aux 4[2]
- 0x10: N-X 1
- |
- 0x13: N-X 4
- 0x14: N-X 5[1]
- |
- 0x17: N-X 8[1]
- 0x18: N-X 9[2]
- |
- 0x1F: N-X 16[2]
- 0x30: reserved for Audition
- 0x40: sum program A
- 0x41: sum program B[2]
- 0x42: sum program 5.1A[2]
- 0x43: sum program 5.1B[2]
- 0x50: sum record
- 0x60: N-X 17[2]
- |
- 0x7F: N-X 48[2]

Level: signed: 0xA6 ... 0x0A = -90dB ... 10dB
0xA6 = fader closed

Note: The SumBusNr is a relative number considering the desk resource definition of the *desk_assignment* defined in the *cab_interfaces.ini* – file.
E.g. sum program A on the secondary desk may be mapped sum program B within the core.

: If the real fader level is not an integer, it is rounded updwards to the next integer (e.g. if the level is –9.9 dB, the returned FADER_LEVEL will be –9 dB, +1.1 dB will be rounded to + 2dB)

[1] Ignored for OnAir1500
[2] Ignored for OnAir 1500 and OnAir2500

6 PROTOCOL CHANGES

6.1 Compatible changes to On-Air 2000 protocol

The following table shows the difference in parameter ranges between the MONITORA implementation in the three different products: OnAir3000, OnAir2500, OnAir1500 and OnAir2000.

Parameter Value Ranges	OnAir3000	Onair2500	Onair1500	OnAir2000
Max. FaderNr	6/12/18/24/ 30/36/42/48[1]	6/12/18/24[1]	6/12[1]	24
AuxNr	Aux 1 Aux 2 Aux 3 Aux 4	Aux 1 Aux 2	-	Aux 1 Aux 2
SumBusNr	Aux 1 Aux 2 Aux 3 Aux 4 N-X 1 | N-X 48[2] sum program A sum program B sum program 5.1A[2] sum program 5.1B[2] sum program record	Aux 1 Aux 2 N-X 1 | N-X 8 sum program A sum program record	N-X 1 | N-X 4 sum program A sum program record	Aux 1 Aux 2 N-X A | N-X F sum program sum program record
Min./Max. Fader Level	-90 dB / +10 dB	-90 dB / +10 dB	-90 dB / +10 dB	-70 dB / +9 dB
Min./Max. Fader InputGain Line:	-18 dB / + 18 dB	-18 dB / + 18 dB	-18 dB / + 18 dB	-15dB / +15dB
Min./Max. Fader InputGain Mic:	-9 dB / + 75 dB	-9 dB / + 75 dB	-9 dB / + 75 dB	-5 dB / + 75 dB
Max. Year	2037	2037	2037	2095

[1] Depends on the confiiguration of the OnAir3000/2500/1500
[2] Depends on the DSP configuration and/or License Key

6.2 Incompatible changes to between OnAir3000/2500 and On-Air 2000 protocol

- SET_PRELISTEN_ON / SET_PRELISTEN_OFF
  Due to larger No. of Faders, the EXT_PFL (0x19) is still a valid fader.
  Additionally, we have two Extern PFLs. The new codes are:
  EXT PFL 1: 0xFF
  EXT PFL 2: 0xFE
  To ensure compatibility with possible extension to more Extern PFL inputs, the codes are counted backwards.
- SET_SUM_FADER_LEVEL / RESET_SUM_FADER_LEVEL / GET_SUM_FADER_LEVEL / SUM_FADER_LEVEL:
  New codes for SumBusNr:

SumBusNr	OnAir2000	OnAir3000/2500	OnAir1500
N-X A / N-X 1	0x03	0x10	0x10
N-X B / N-X 2	0x04	0x11	0x11
N-X C / N-X 3	0x05	0x12	0x12
N-X D / N-X 4	0x06	0x13	0x13
N-X E / N-X 5	0x07	0x14	-
N-X F / N-X 6	0x08	0x15	-
Sum program / Sum program A	0x0A	0x40	0x40
Sum record	0x0B	0x50	0x50

- SET_SAS_INPUTROUTING / GET_SAS_INPUTROUTING / SAS_INPUTROUTING:
  Up to 254 HD Link inputs can be addressed.
- FADER_LEVEL: The special Level value 0x80 (-128 dB) that has been used to indicate ‘fader closed’ will not be used anymore. Instead, the smallest possible Level of the On-Air 3000/2500/1500 (-90 dB = 0xA6) represents the ‘fader closed’ state.