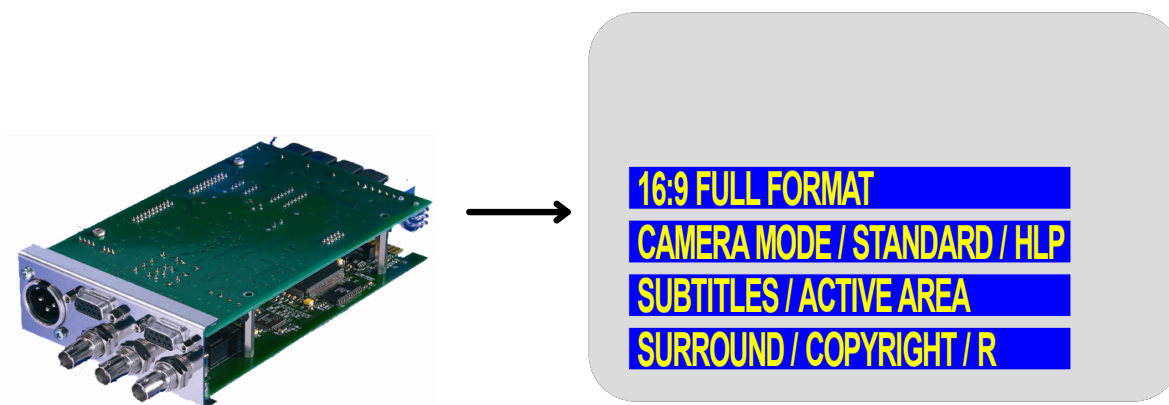


WSS Decoder

Visible Insertion of WSS Data
Programmable GPI Functions
for a RUBIDIUM Module (AI, DI, XI) with Option "W"



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A1 Revision History

No.	Date	Subject
0.n		Preliminary documents, changes without notice.
1.0	November 12, 2009	First released document.
1.1	October 26, 2010	Revised.
2.0	December 09, 2011	Available now for XI modules as well.

A2 Copyright

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A3 General Remarks

This manual is a supplement to the "Installation & Systems Manual RUBIDIUM SERIES". It describes a special operating mode of an AI or DI or XI module realized by the appropriate firmware. Please read the below listed chapters of the "Installation & Systems Manual RUBIDIUM SERIES", as these chapters are necessary for the safe and proper use of Rubidium module **AI** or **DI** or **XI**.

- A3 Warranty,
- A4 Unpacking/Shipping/Repackaging Information,
- A5 Safety Instructions,
- A6 Certifications & Compliances,
- Plug-In a Module,
- Remove a Module.

1 Functional Description

1.1 Overview



WSS: Wide Screen Signalling. A RUBIDIUM module AI/DI/XI with option W decodes these data of line 23 according to the European Standard **EN 300 294** (version: V1.4.1, 2003-04). The decoded data can visibly be displayed on a video window. Choose the Rubidium module according to the video system:

RUB AI: CVBS analogue video 625/50 (PAL).

RUB DI: Digital video channel (SD).

RUB XI: Digital video channel (3G, HD, SD).

RUB XI additionally can decode WSS data out of an Ancillary Data Packet according to **SMPTE 2031** in conjunction with **ETSI EN 301 775**.

These are the key features of the system:

- Decoding of the WSS data. The 14 data bits are grouped in 4 data groups:
 - Group 1 Aspect ratio: Full format or letterbox, position.
 - Group 2 Enhanced services: Camera or film mode, colour code, helper signal.
 - Group 3 Subtitles: Yes/no and mode.
 - Group 4 Others: Surround sound, copyright.
- Four windows are available to display the decoded data in a bit or text format. Each video window can be positioned over the entire screen. Size, brightness, background mask, ... , can be adjusted.

Example for a text format (data group 1): 4:3 FULL FORMAT

Example for a bit format (data group 1): GROUP 1: 0001

A description of each individual bit is given in the next chapter. The first bit displayed in the video window corresponds to the LSB, so this example shows b0 b1 b2 b3.

- GPI outputs are available signalling the state of selected bits.

If decoding of WSS data out of line 23 is required, it is recommended to adjust the WSS decoder to your video signal during first installation. Please once perform an **Auto Adjust** (see chapter "Configuration of the RUBIDIUM Module", item 3: WSS Parameter).

1.2 Information Content of WSS Data Bits

Group 1 Aspect Ratio, bits b0 b1 b2 (b3 = odd parity bit):

b0 b1 b2	Aspect ratio label	Full format/ Letterbox	Position	No. of active lines	Text display
000	4:3	Full format	-	576	4:3 FULL FORMAT
100	14:9	Letterbox	Centre	504	14:9 LETTERBOX CENTRE
010	14:9	Letterbox	Top	504	14:9 LETTERBOX TOP
110	16:9	Letterbox	Centre	430	16:9 LETTERBOX CENTRE
001	16:9	Letterbox	Top	430	16:9 LETTERBOX TOP
101	>16:9	Letterbox	Centre	-	+16:9 LETTERBOX CENTRE
011	14:9	Full format	Centre	576	14:9 FULL FORMAT CENTRE
111	16:9	Full format	-	576	16:9 FULL FORMAT

Group 2 Enhanced Services, bits b4 b5 b6 (b7 = reserved):

b4	Film Bit	Text display	b5	Colour coding	Text display	b6	Helper Bit	Text display
0	Camera mode	CAMERA MODE	0	Standard	STANDARD	0	No helper	-
1	Film mode	FILM MODE	1	Motion Adaptive Colour Plus	COLOUR+	1	Modulated helper	HLP

Example for a text format: **CAMERA MODE / STANDARD / -**

Group 3 Subtitles, bits b8 b9 b10:

b8	Subtitles within Teletext bit	Text display	b9 - b10	Subtitling mode	Text display
0	No subtitles	NO SUBTITLES	0 0	No open subtitles	NO OPEN SUB
1	Subtitles within teletext	SUBTITLES	1 0	Subtitles in active image area	ACTIVE AREA
			0 1	Sub. out of active image area	OUT OF AREA
			1 1	rReserved	?

Example for a text format: **SUBTITLES / ACTIVE AREA**

Group 4 Others, bits b11 b12 b13:

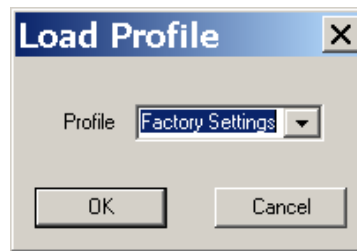
b11	Surround sound	Text display	b12	Copyright bit	Text display	b13	Gener-ation Bit	Text display
0	No surround sound information	NO SURROUND	0	No copyright asserted or status unknown	NO COPYR	0	Copying not restricted	-
1	Surround sound mode	SURROUND	1	Copyright asserted	COPYRIGHT	1	Copying restricted	R

Example for a text format **SURROUND / NO COPYR / -**

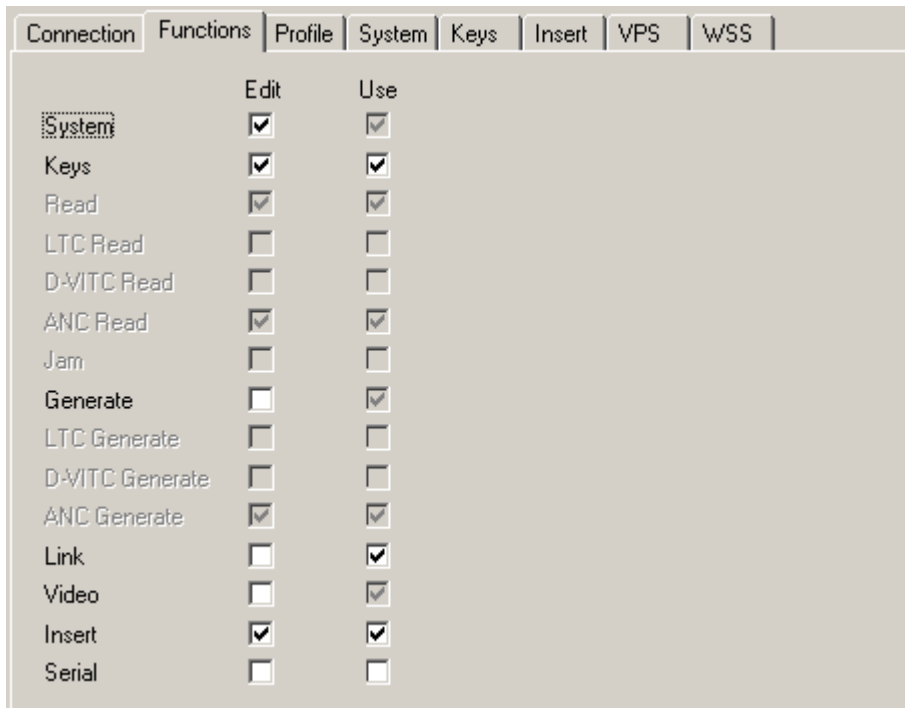
1.3 Configuration of the RUBIDIUM Module

Upon delivery, the RUBIDIUM module has got a setup to a basic configuration. The following guide describes the setups and enables you to find the configuration for your special environment. This example shows screen shots of the PC program tabs configuring a DI module.

1. "Factory Settings": Start the configuration after a "Reset" of the module.
Activate the "Profile" tap and select: Profile: **Factory Settings**
Click on the **OK** button.

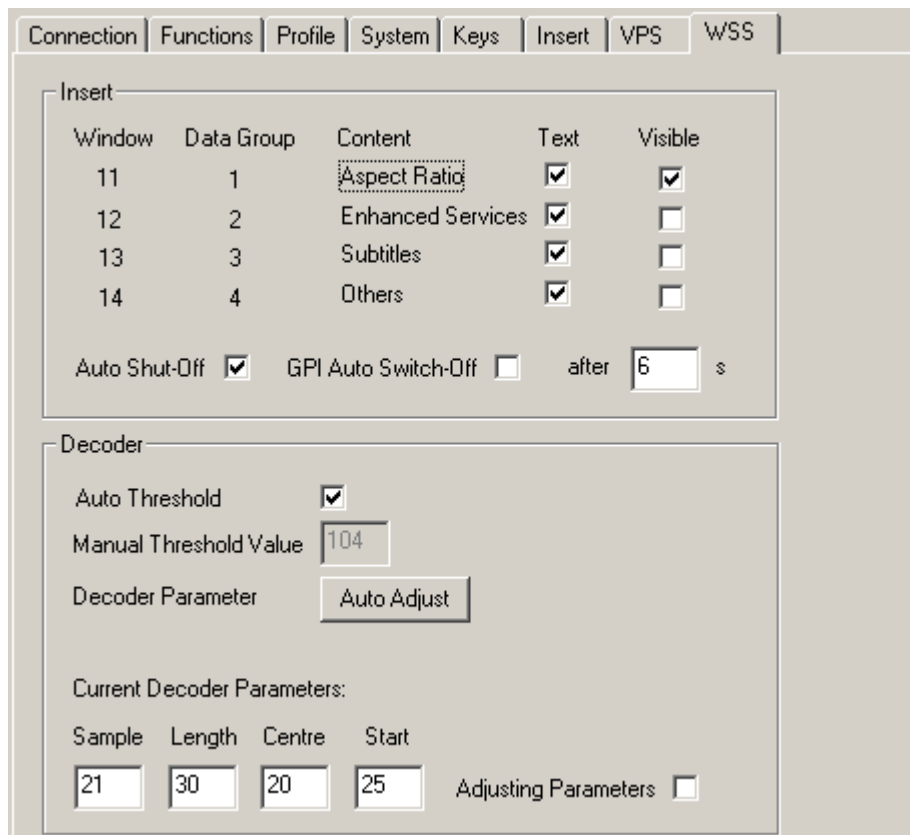


2. Select **Functions**:
If "Factory Settings" has been applied, the following functions now are activated or deactivated ("VPS" tab appears only if option **V** has been installed as well):



To enable further functions click on the applicable **Edit** and/or **Use** check boxes.

3. WSS Parameter:



Insert

The WSS data are grouped in 4 data groups. Each group has its own window. The columns "Window" and "Data Group" indicate which group belongs to which window of the video inserter (please also refer to the "Insert" function). Click on the "Text" checkbox to switch between text format and bit format. Use the "Visible" checkbox to switch the window on or off.

Auto Shut-Off In case no valid WSS data can be received, the display can be switched off automatically after a delay. In this case, a message appears instead of the text or bit format:

Gruppe	Meldung
1	WSS ASPECT RATIO: ?
2	WSS ENHANCED SERVICES: ?
3	WSS SUBTITLES: ?
4	WSS OTHERS: ?

The delay can be selected in the range of **2 – 10** seconds. This auto switch-off can be deactivated.

GPI Auto Switch-Off In case no valid WSS data can be received the GPI signal outputs can be switched to inactive state with the selected delay.

Option "W" WSS Decoder

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Decoder

It is possible to adjust some parameters of the WSS decoder if decoding of WSS data out of line 23 is required. This set-up has no relevance if WSS data will be decoded out of an Ancillary Data Packet.

Auto Threshold The WSS data threshold can be adapted automatically to the video and data level.

Manual Threshold Value While "Auto Threshold" has been deactivated, the threshold value can be adjusted manually. This way it is possible to find out the limits of the threshold.

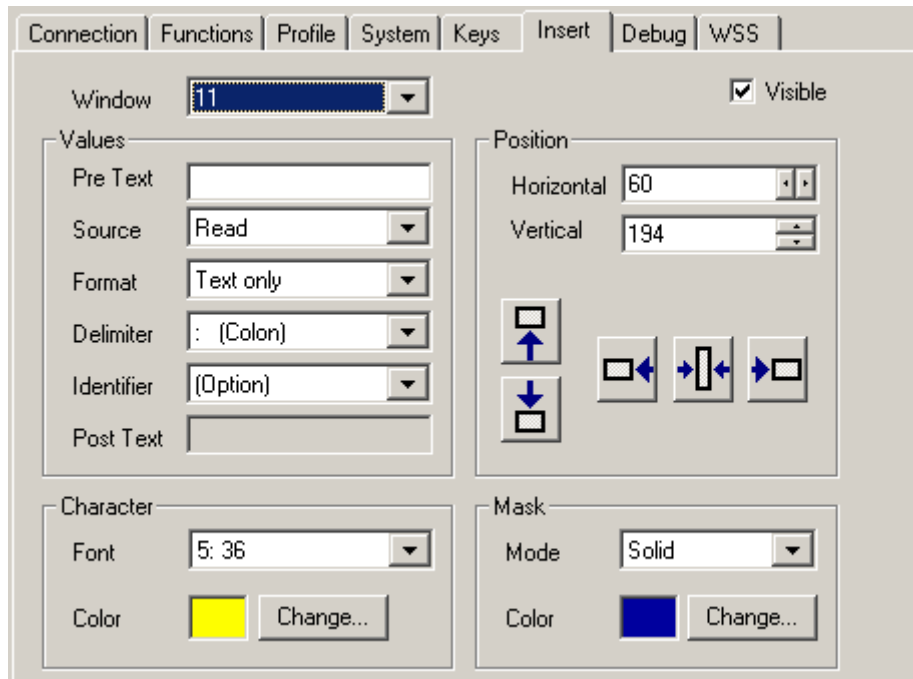
Decoder Parameter The current values of four additional parameters are shown in the "Sample", "Length", "Centre" and "Start" windows. These parameters should be adjusted once automatically.

*Click the **Auto Adjust** button to start the auto-adjust procedure. The procedure will last about 14 minutes. A click on the **Reload Page** button (beneath the tab) refreshes all parameters on this tab; this enables to monitor the changes at the parameters. The **Adjusting Parameters** checkbox as well as the **WSS ADJUST** lamp indicate the run status of the procedure. The procedure will be finished automatically, the best parameters has then been found and stored.*

4. Adjust the **Video Windows**:

The video window can be adjusted according to your needs.

The windows 11 to 14 have been reserved for the four WSS data groups.



XI modules have a digital video channel for SD and HD video formats. XI adjusts position and size of all visible windows automatically according to the applied video format. All calculations will be referenced to that video format which is present during last set-up at **Insert** tab.

It is recommended to choose the video format with least number of lines during set-up.

Examples: If you are working with SD and HD video formats, apply SD video during set-up.

If you only switch between an HD 720 format and an HD 1080 video format, apply HD 720 format during set-up.

Option "W" WSS Decoder

5. LEDs, Lamps and GPI:

The following functions for the **LEDs** are provided:

- WSS Signal LED lights up as long as valid WSS data can be received.
- WSS Data Received LED lights up as soon as valid WSS data could have been decoded once after power-on.

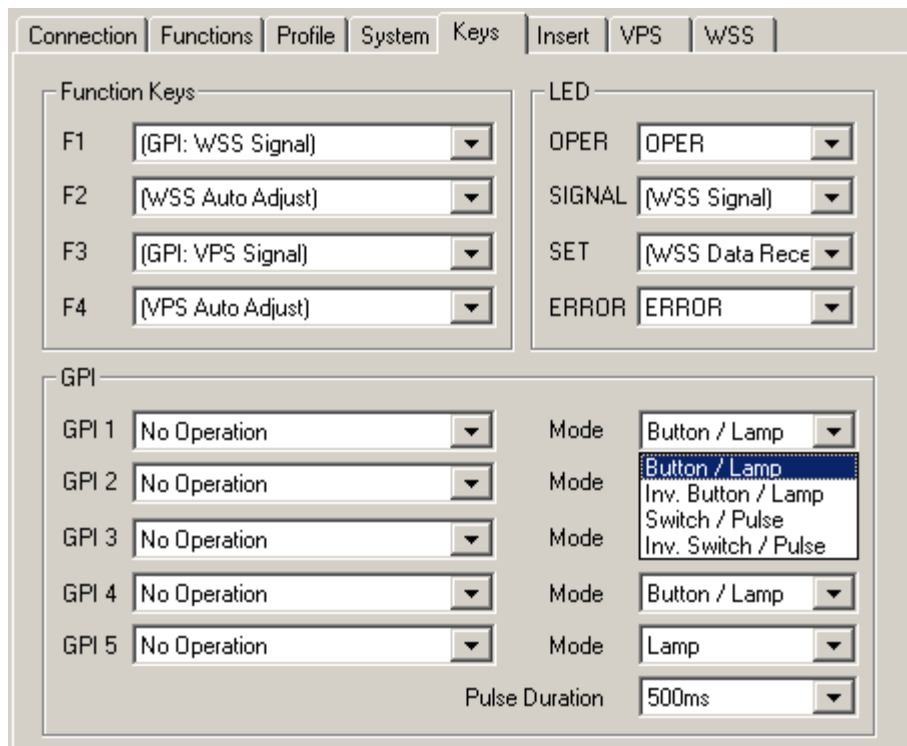
The following functions for the **lamps** are provided:

- WSS Signal Lamp lights up as long as valid WSS data can be received.
- WSS Auto Adjust Lamp lights up indicating that the auto-adjust procedure is running.

The following functions for the **GPI outputs** are provided:

- WSS Aspect Ratio bit 0 WSS 4:3
- WSS Aspect Ratio bit 1 WSS 14:9
- WSS Aspect Ratio bit 2 WSS 16:9
- WSS Letterbox
- WSS Subtitles WSS Surround Sound

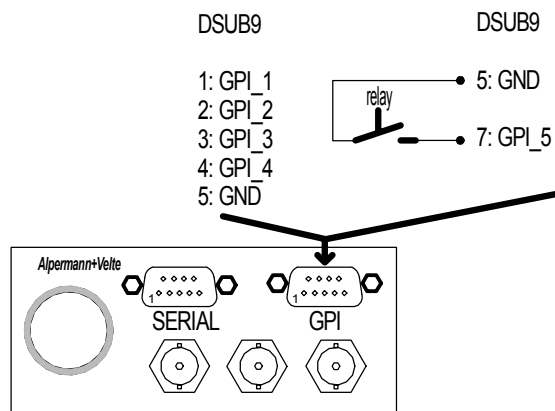
Please refer to the chapter "GPI Signal Outputs: Programmable Functions".



1.4 GPI Signal Outputs: Connection

There are four GPIs (General Purpose Interfaces) located at DSUB9 female connector GPI/LTC IN at the rear panel of the module. Basically each GPI (GPI_1 to GPI_4) can be an input or an output.

Further a relay contact (GPI_5) can be assigned for an output feature. The relay connects to GND on its active state.



1.5 GPI Signal Outputs: Programmable Functions

The following functions for the **GPI outputs** are provided. A description of each individual WSS bit is given in the chapter “Information Content of WSS Data Bits”.

WSS Aspect Ratio bit 0 WSS Aspect Ratio bit 1 WSS Aspect Ratio bit 2	Direct output of the bit values of b0, b1 and b2 (group 1). The aspect ratio can then be decoded according to the table in the chapter “Information Content of WSS Data Bits”.
WSS 4:3	Aspect ratio 4:3 detected. Bits b0, b1 and b2 (group 1) will be evaluated. GPI becomes active if the bit combination equals to 000.
WSS 14:9	Aspect ratio 14:9 detected. Bits b0, b1 and b2 (group 1) will be evaluated. GPI becomes active if the bit combination equals to 100 or 010 or 011.
WSS 16:9	Aspect ratio 16:9 detected. Bits b0, b1 and b2 (group 1) will be evaluated. GPI becomes active if the bit combination equals to 110 or 001 or 101 or 111.
WSS Letterbox	Letterbox format detected. Bits b0, b1 and b2 (group 1) will be evaluated. GPI becomes active if the bit combination equals to 100 or 010 or 110 or 001 or 101.
WSS Subtitles	Bit 8 (group 3): GPI becomes active if bit 8 = 1.
WSS Surround Sound	Bit 11 (group 4): GPI becomes active if Bit 11 = 1.

After power-on, the GPI outputs remain inactive until valid WSS data can be decoded. Having “GPI Auto Switch-Off” enabled, the GPI outputs become inactive again if the WSS data input fails – except the GPI output directly reflects the state of a bit. Having “GPI Auto Switch-Off” disabled, the GPI output will remain its last state until a new state can be decoded.