

INSTRUCTION MANUAL

**Configuration and Transmission  
of RadioText Plus (RT+)  
with  
SmartGen RDS/RBDS Encoders**



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# Contents

|  |           |
|--|-----------|
| <b>What Is RadioText Plus ?</b> .....                    | <b>4</b>  |
| <i>RT+ tag</i> .....                                     | 5         |
| <b>How to configure SmartGen to broadcast RT+?</b> ..... | <b>6</b>  |
| <i>Setup as RDS ODA with UECP commands</i> .....         | 6         |
| <i>Setup with ASCII commands</i> .....                   | 8         |
| <b>References</b> .....                                  | <b>10</b> |

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## What Is RadioText Plus ?

RadioText Plus or RT+ allows the RDS feature RadioText (RT) to be understood by FM RDS receivers. RT+ is based on RDS RT messages and is backwards compatible with standard RT. It enables FM RDS receivers to recognize designated elements of RadioText messages. Such an element can, for example, be programme-associated metadata such as the Title and the Artist of the currently playing song, or it can be news headlines. This provides the listener with an “mp3-player feeling” while listening to analogue FM radio. The elements can also carry additional service messages or information about the Radio Station such as the telephone number or the web address of the Radio Station’s hotline.

RT+ is based on RDS RT messages and is completely backwards compatible to the RT. All additional information necessary for implementing the RT+ service is carried in the RDS group 3A and in an appropriate RDS ODA group (see table below).

| <b>RT+ information elements</b> |                    |                  |
|---------------------------------|--------------------|------------------|
| RT Message                      | RT+ identification | RT+ tags         |
| RDS group 2A/B                  | RDS group 3A       | RDS ODA group xA |

## RT+ TAG

When an RT message like “You are listening to “House of the rising sun“ by Eric Burdon” is sent out, the RT+ information elements Title and Artist are marked by two RT+ tags.

An RT+ tag consists of three elements:

- RT Content Type
- Start Marker pointing to the position (inside the RT message) of the first character of that RT+ information element
- Length Marker indicating the additional length (in addition to the character at the start position) of that RT+ information element

The Content Type is taken from a list with 64 entries. For the example given above the two tags are as follows:

|                 |            |
|-----------------|------------|
| RT Content Type | ITEM.TITLE |
| Start Marker    | 22         |
| Length Marker   | 22         |

|                 |             |
|-----------------|-------------|
| RT Content Type | ITEM.ARTIST |
| Start Marker    | 50          |
| Length Marker   | 10          |

Start Marker and Length Marker can be derived from the following scheme below:

```

You are listening to "House of the rising sun" by Eric Burdon
0----0----1----1----2----2----3----3----4----4----5----5----6----
0----5----0----5----0----5----0----5----0----5----0----5----0----
  
```

**NOTE:** The addresses of the RT characters range from 0 to 63, so the start marker can take the same values.

The length marker is ranging from 0 to 63 and from 0 to 31 respectively. If two RT+ elements are contained in the RT, they shall not overlap. The tag information sent out shall not change during the lifetime of the associated RT. More details you can find in “[1] [RadioText Plus Specifications](#)”.

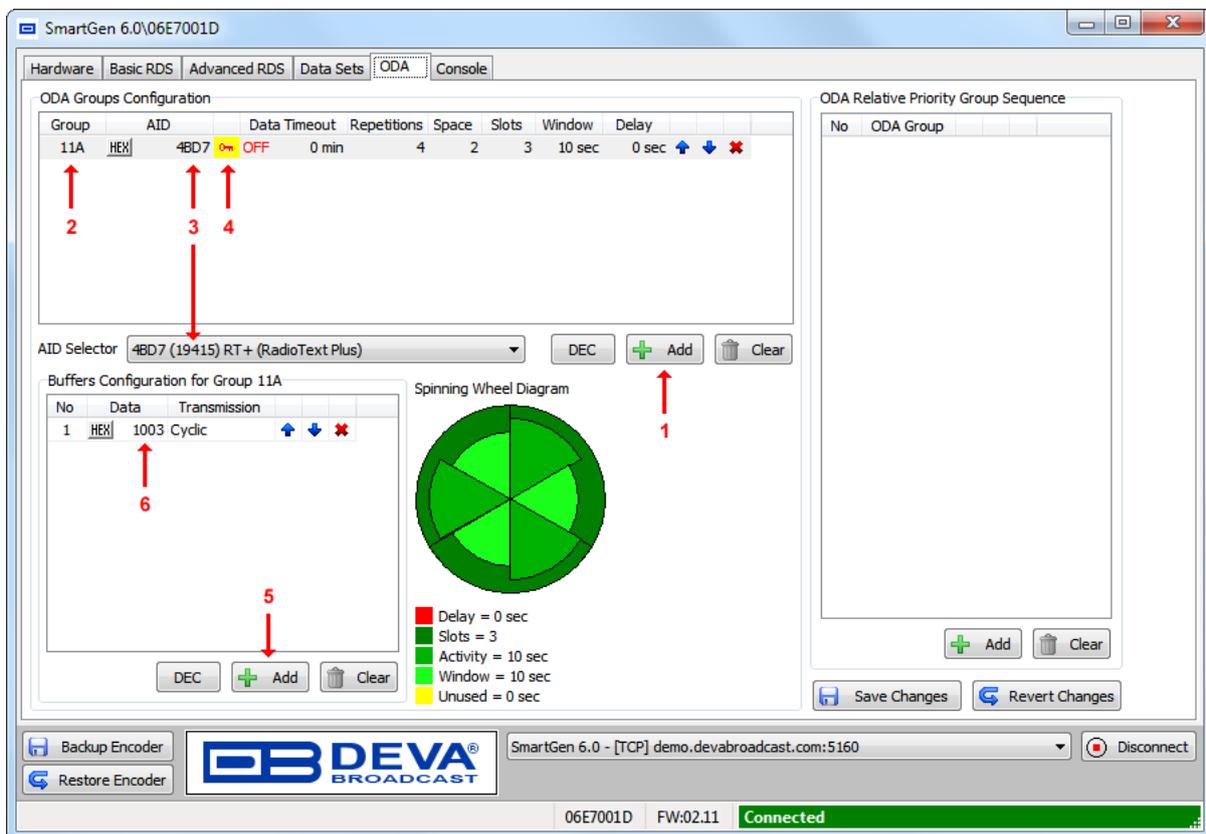
# How to configure SmartGen to broadcast RT+?

## SETUP AS RDS ODA WITH UECP COMMANDS.

Since RT+ is an ODA application and SmartGen have full UECP support this way of configuring and feeding of RT+ data is strongly recommended. Thus you can take an advantage of the great flexibility provided by the UECP protocol. The SmartGen Encoders Manager application software has very intuitive and user friendly graphical interface so you can make this kind of setup very easy and quick. To do this start the SmartGen Encoders Manager and then connect to the device. Click on Advanced RDS tab and then click on ODA tab.

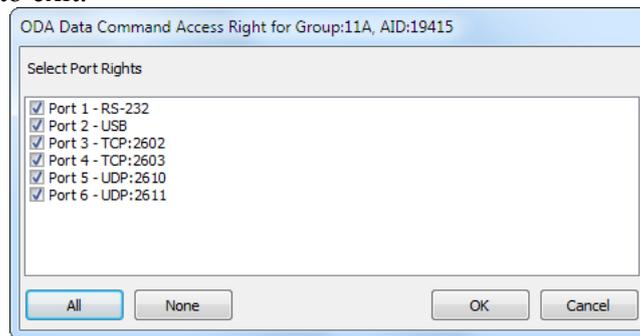
Click the “Add” button to add new ODA application to ODA list as is shown on the Picture 1.

The RT+ can be sent with groups 5A, 6A, 7A, 8A, 9A, 11A, 12A and 13A. In this example we will use group 11A. In the field ODA enter 11A, for AID choose 4BD7 (hexadecimal), which is ODA AID for RadioText+. You can leave the rest of the fields unchanged since they configure more sophisticated methods of transition of ODA, which is not an object of this article.



Picture 1

Note the red key picture next to AID field. Click on that key to see the dialog with ODA data Command Access Rights. Choose Port(s) on which ODA data should be accepted (see the Picture 2). Click OK to exit.

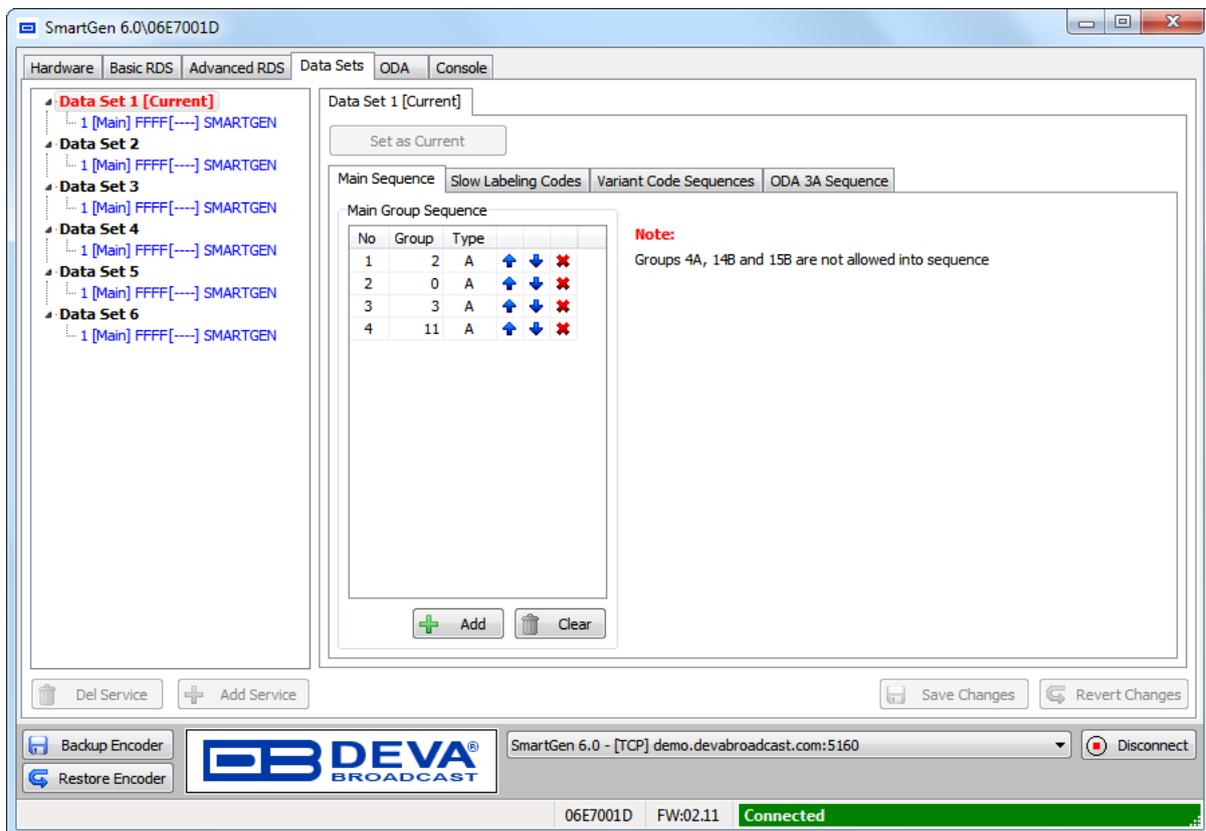


Picture 2

In the ODA Buffers Configuration you can add a set of messages to be carried by RDS group 3A along with ODA signaling. The additional information consists by fields CB flag and Server Control Bits (SCB) and Template number (see also “[1] RadioText Plus Specifications”). Setting value for this field is not obligatory for the encoder to start transmission of this ODA.

The next step is to go to Data Sets tab and select the red colored Current Data Set. Add the ODA signaling group type 3A and selected group type for RT+ data (11A in this example) in the Main group Sequence. Group 2A contains RT itself.

**NOTE:** You can add every group type more than once in the group sequence and thus provide the desired ratio between transmitted RDS groups.



After this setup is done the encoder is ready to accept and transmit RadioText+ as ODA with UECP commands ODA data (MEC 46h) and ODA free-format group (MEC 42h). More details on UECP protocol you can find at “[2] RDS Universal Encoder Communication Protocol Version 7.05”.

## SETUP WITH ASCII COMMANDS

In the new firmware revisions (02.03 and above) of SmartGen RDS/RBDS Encoders was introduced a direct ASCII support for configuring and providing a “live” data for RadioText+. There are several ASCII commands to do this. First we must choose the RDS group to carry the RadioText+ data.

In this example we choose RDS group 11A. As we mention earlier the suitable groups for RT+ are 5A, 6A, 7A, 8A, 9A, 11A, 12A and 13A.

First step in configuration process is to establish connection to your SmartGen by terminal program or by Console tab of SmartGen Encoders Manager. Type `SQC?` in console window to see the current group sequence. The group 11A, and group 3A (used for RT+ signaling) must be added to the group sequence. Simply type:

```
SQC=0A, 2A, 3A, 11A
```

and the new group sequence will contain RDS groups 3A and 11A. Group 2A contains RT itself and group 0A – PS. These two group types (2A and 0A) are obligatory for the group sequence.

The next step is to set the chosen RDS group (11A) as RT+ data group. Type:

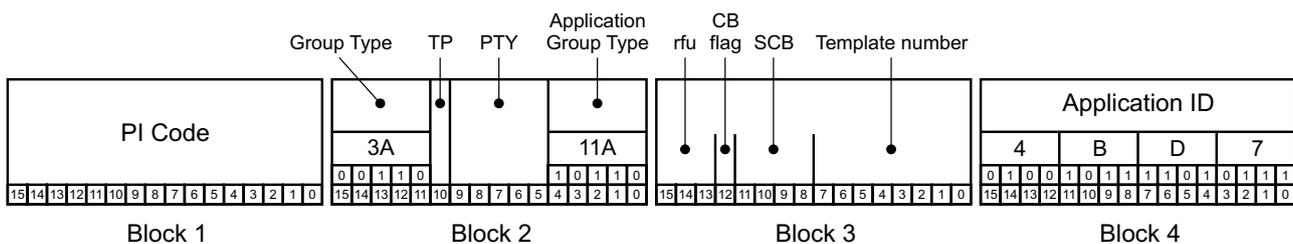
```
RT+GROUP=11A
```

By issuing this command the RT+ will be linked with RDS group 11A. Note that RT+ data will be accepted only on port, on which this command is received. This setting can be changed with SmartGen Encoder Manager (ODA tab, see Picture 1 and Picture 2). Although it is possible to configure more than one port to feed RT+ data to the encoder this will result to inconsistency of RT+ data.

To add additional message data to be carried in block 3 of RDS group 3A such as CB flag and Server Control Bits (SCB) and Template number, type the following:

```
RT+TPL=XXXXX
```

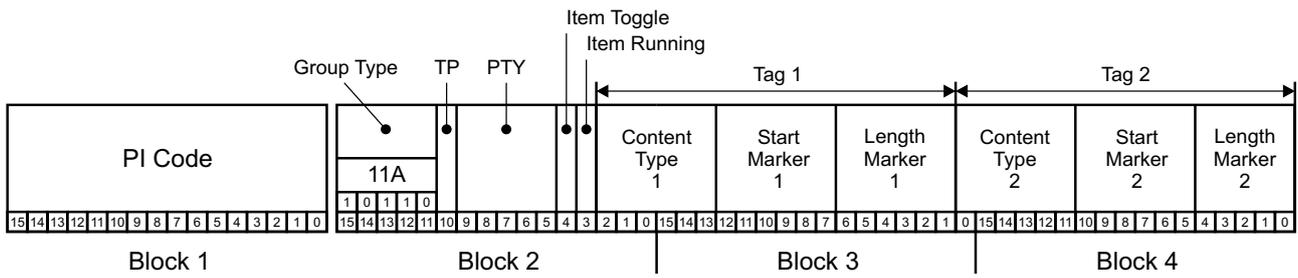
Here XXXXX is decimal number between 0 and 65535, and represents the data in block 3. The data encoding is in RT+ specification. This information is not mandatory for encoder to start RadioText+ transmission. If this command is not used the Message bits in RDS group 3A will remain zero.



After accomplish these settings the SmartGen is ready to accept and transmit RadioText+ data. Type:

```
RT+TAG=04, 22, 22, 01, 50, 10, 0, 0
```

Here are eight comma delimited decimal numbers with RT+ tagging data in following order: tag 1 type, tag 1 start, tag 1 length, tag 2 type, tag 2 start, tag 2 length, item running bit value and data timeout (0=NO TIMEOUT, 1-255 timeout in minutes). The accepted values for each field is as follows (00-63, 00-63, 00-63, 00-63, 00-63, 00-31, 0-1, 0-255). After setting the tagging with this command the SmartGen will start to transmit group 11A according to the specified group sequence. If no timeout has been set transmission of this data will continue to the moment of new data arrival or power loss (the RT+ tagging data are volatile, but RT+ configuration remains). If timeout is set then in case of timeout elapsing the transmission of RDS group 11A (in this example) will stop. In the picture below is shown coding of RT+ tagging data in given application group (11A in our case).



**NOTE:** The Item Toggle bit could not be set manually, because it is toggled every time the RT+TAG= command is issued.

## References

[1] RadioText Plus Specifications

- [http://tech.ebu.ch/docs/techreview/trev\\_307-radiotext.pdf](http://tech.ebu.ch/docs/techreview/trev_307-radiotext.pdf)

[2] RDS Universal Encoder Communication Protocol Version 7.05

- [http://www.rds.org.uk/2010/pdf/UECP\\_7\\_05\\_100224\\_pw53.pdf](http://www.rds.org.uk/2010/pdf/UECP_7_05_100224_pw53.pdf)