AUTOMATING RDS WITH THE MP-532 AUDIO PROCESSOR

Part of the "connected car" experience is delivering the title and artist of the current song from the automation system directly to the dashboard via RDS. Stations will also use their automation system to send promotional and sponsor messages using this feature.

For a full explanation of RDS, including **critical settings** such as **PI codes** and **injection levels**, refer to the MP-532 manual.

GETTING THE DATA TO THE MP-532

The MP-532 receives its text data from the automation system via Ethernet using UDP packets. Any valid UDP port will work so long as the port numbers match on both the automation PC and MP-532.

Tip: In multi-station environments, you should make sure to use a unique UDP port for each automation PC so you don't send the wrong artist/title to the wrong station!

If you have an older automation system that only transmits serial data you will need to turn the RS-232 data into UDP. There are software packages and devices capable of doing this. Converting serial to UDP is outside the scope of this document and outside the scope of Wheatstone Technical Support.
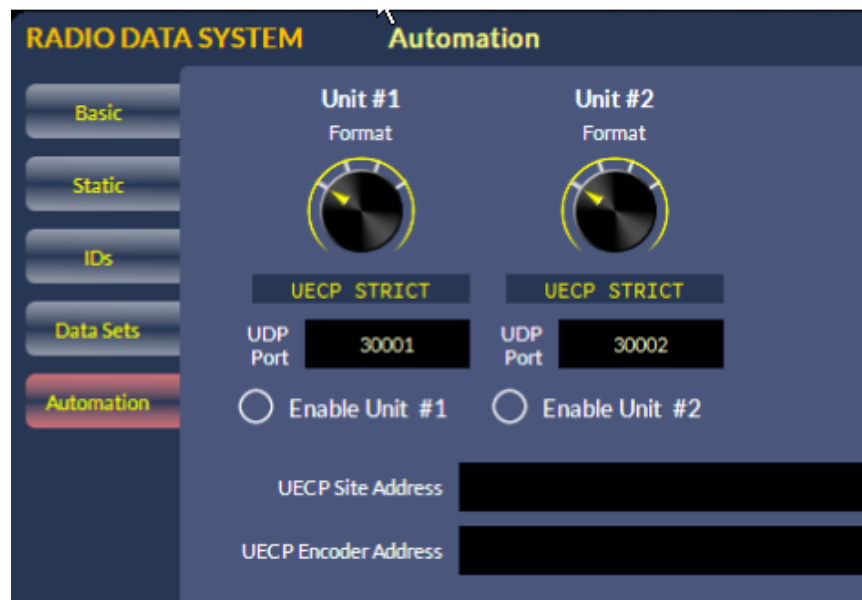
SET UP THE UNITS IN THE MP-532

The Automation tab on the MP-532 has two *units*. One data source (automation computer) connects to one unit. While most stations will only use one unit, having a second data source available gives you the ability to update different data sets at the same time.

Use the knob to select the data format that matches what your automation system is sending:

- UCEP Strict
- UCEP Unpacked
- Plain Text PS
- Plain Text RT

UCEP STRICT

UCEP, the Universal Encoder Communication Protocol, is the message format of the RDS Forum Technical Specification SPB 490 (2010). Each message is bounded by special start and stop bits and includes a checksum and other requirements. If the strict requirements aren't met, then the message is rejected – which is why we call it "UECP Strict." If your automation system sends a full UECP message exactly to spec, choose this option.

UECP UNPACKED

When a Unit receives a Strict message, it has to "unpack" it – in other words, we strip away the start and stop bits, calculate and remove the checksum (CRC), and translate the escape characters before passing it on to the listener's radio.

Many automation systems will send us this "unpacked" end result instead of the full strict message. If that's what your automation system sends, choose UECP Unpacked.

IMPORTANT UECP NOTES

Incoming UECP messages have a four-tiered addressing scheme. The top level is the UECP Site Address, which is a number in range 1-1023. This corresponds to a transmitter location or broadcast facility. The next level is the UECP Encoder address, which differentiates multiple encoders at the same site. Valid entries in the spec are 1-63. Next is the Data Set Number, ranging from 1-253, that corresponds to the 253 data sets available for storing metadata. Finally, there is the Program Service Number (PSN), which can be from 1 to 255.

In an incoming UECP message, each of these addresses may be set to the special value of zero. In the Site Address, it means "all sites." In the Encoder Address, it means "all encoders." In the DSN field, it means "current data set." For most installations zero is sufficient.

The PSN field MUST be set to zero, otherwise the MP-532 will ignore the message.

On the MP-532, if you have a UECP site address, set it in the Automation Settings panel. If you don't have a site address, enter zero. The same goes for the UECP Encoder Address.

The MP-532 implements the following UECP commands, and will pass them if sent via your automation system via either the strict or unpacked setting

01	PI	Set Program ID code
02	PS	Set Program Service Name
03	TA/TP	Set Traffic Advisory/Program flags
04	DI/PTYI	Set values for Dynamic PTY, Stereo/Mono and Compressed flags

05	MS	Set Music/Speech flag
06	PIN	Set Program Item Number, the start time of the current program
07	PTY	Set Program Type code
13	AF	Set Alternate Frequencies
1C	DataSetSelect	Set current Data Set
3E	PTYN	Set Program Type Name, an 8-character string which extends PTY
24	FreeFormat	Transmit arbitrary RDS message using raw data blocks passed in
25	IH	Transmit In-House RDS message
2B	EWS	Transmit Emergency Warning System message
30	TMC	Transmit Traffic Message Channel ODA message
40	ODA	Configure Transmit ODA configuration message, transmit short ODA
42	ODA	FreeFormat Transmit free format ODA message
46	ODA	Data Transmit ODA message

PLAIN TEXT PS

Text received in this format setting will be transmitted to the radio's Program Service display. This is an 8 character field (including spaces) that is traditionally used to show call letters or brand name. (ie "KZZP-FM" "104.7 FM" "The Buzz") A PS text string longer than 8 characters will be displayed in scrolling fashion in 8 character chunks. This text is displayed verbatim. Whatever you send will show up on the radio. This value isn't saved, so if you switch to a different data set after the message is received, the value is lost.

PLAIN TEXT RT

Text received in this format setting will be transmitted to the tuner's Radio Text display. This is a 64 character field and is commonly used for sending artist and title date. This text is displayed verbatim. Whatever you send will show up on the radio. This value isn't saved, so if you switch to a different data set after the message is received, the value is lost.

SETTINGS FOR COMMON AUTOMATION SYSTEMS

While Wheatstone Technical Support cannot provide an exhaustive list of all automation systems that the MP-532 is compatible with, we have obtained settings from many popular vendors, and offer these examples to help you get up and running.

BROADCAST ELECTRONICS "THE RADIO EXPERIENCE"

The Radio Experience is a software package from BE that interfaces to Audio Vault and other automation systems to send now playing data to RDS encoders like the one in the MP-532, HD Radio importers/exporters, and streaming providers.

In the *TRE* application, select **Add UDP Port**. Enter the IP address of the MP-532, the UDP port number that both devices will use, and check the "Use UECP" box.
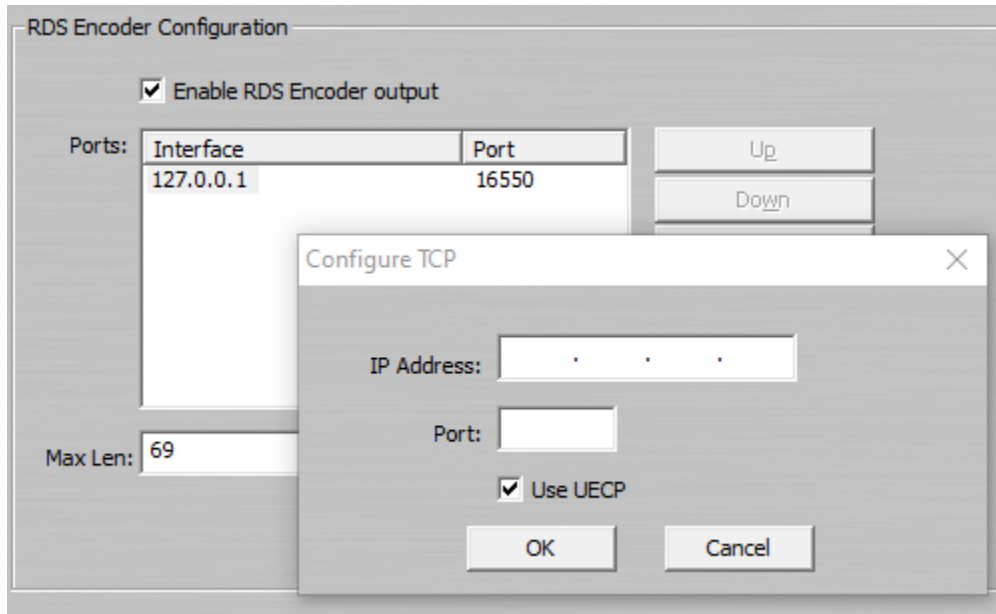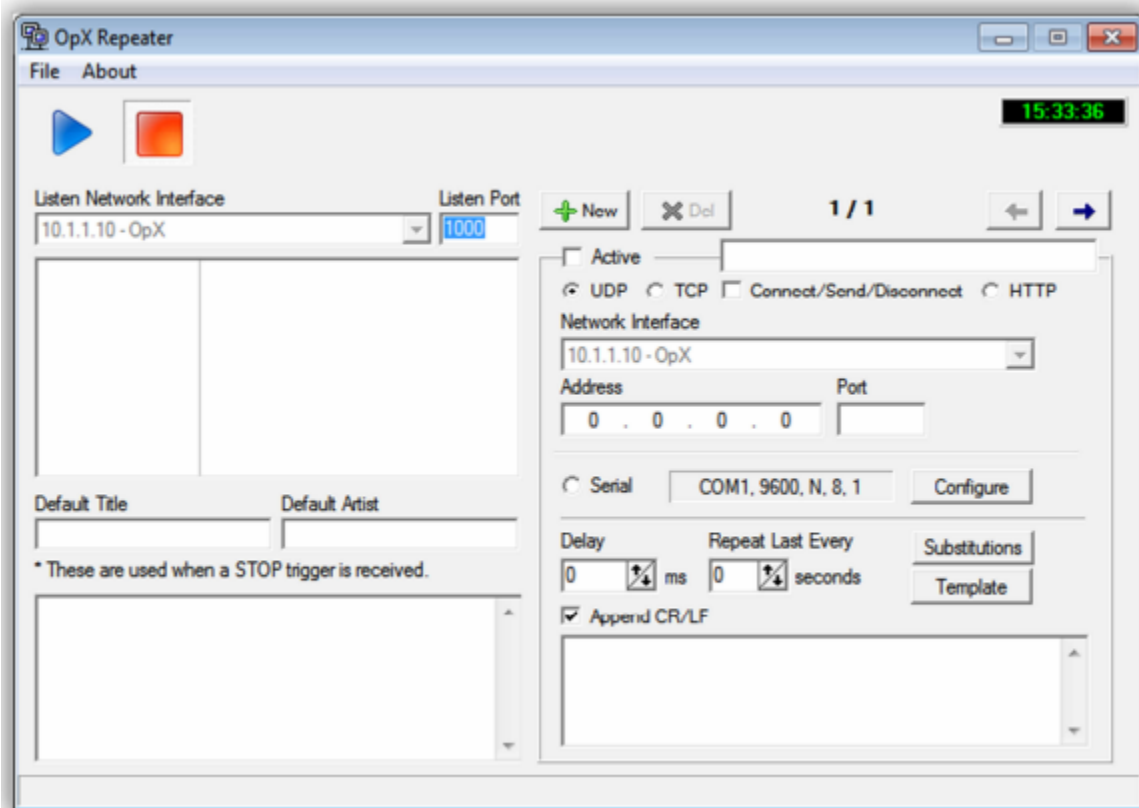

FIGURE 1 TRE SETUP SCREEN

On the MP-532, select the **UECP Unpacked** format option and enter the same UDP port number that the TRE software is using.

BSI (BROADCAST SOFTWARE INTERNATIONAL) OP-X ONE

The Data Repeater function of BSI's OP-X One sends artist/title date to RDS and streaming eoncders.

Refer to pages 301-330 of the Op-X One manual for more information.

When setting up a Data Repeater in Op-X for the MP-532:

- The Data Repeater module must be stopped before editing.
- On the left side you will set the network interface and port of your OpX File Server. (Contact BSI if you don't know what port your file server is set for.)
- On the right side of the screen, select UDP and from the drop-down choose the network interface to transmit this data on that matches the subnet where your MP-532 is located. (This may be the same or different from where OpX's file server is located depending upon how you have configured your facility. If on a different subnet you will have more than one NIC in the PC.)
- Enter the IP address and UDP port as configured in the MP-532

- Click the Template button.
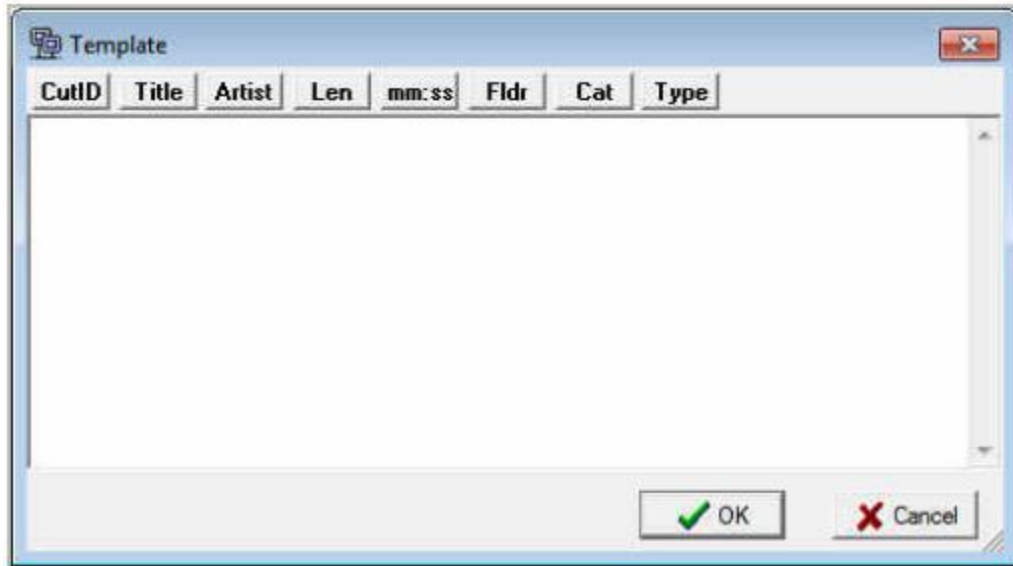
Here you will set up the template of what will get sent to the RDS encoder. Click the Title button to insert the title variable. Click the Artist button to insert the artist variable. You could then type something like [Title] by [Artist] on Q105 (where the [Title] and [Artist] are the variables inserted by clicking the button.) Click OK when you are finished.
- Turn on the Data Repeater module when you are finished editing.

This will set up the text feed coming from Op-X.

Now, in the MP-532, enter the UDP port you set up in the Op-X Data Repeater and choose the **Plain Text RT** function.

When Op-X sends us the text over specified UDP port we will send it to the radio using the Radio Text function.

Tip: You can also set up a second Data Repeater and a second Unit in the MP-532 to send the same text to the PS (Program Service) field. Just use a different UDP port and choose the Plain Text PS function on the MP-532. Why do this? Some older radios only display the PS field. Your text will scroll 8 characters at a time, but you'll get your metadata to all of the radios that support some flavor of RDS.

BSI (BROADCAST SOFTWARE INTERNATIONAL) OP-X
See above; the setup is identical to Op-X One.

ENCO SYSTEMS PADAPULT

ENCO Systems' *PADapult* software will send artist and title information to RDS encoders like the one in the MP-532, HD Radio Importer/Exporters, and web stream hosts.

In *PADapult*, enter the IP address and UDP port that you have assigned to the MP-532.

The screen shot below will show you how to format the RT message to show artist, title, and station information. This will be sent to the MP-532 as plain text.

In the MP-532, set the format to **Plain Text RT**.

PADapult can send other text messages during commercial breaks that will also be sent to the MP-532 as plain text. Consult the *PADapult* manual for more information.

ENCO will need to periodically ping the MP-532 to ensure that the connection is live, so make sure to allow ping requests through your firewall (or disable the Windows firewall on the ENCO workstation) as detailed in their manual.

TIP: You can send the artist and title to both the RT and PS fields if you set up a second unit in the MP-532 set to **Plain Text PS** and then set up a second PADapult output formatted as a PS message as shown in the above screen shot (substituting PS= for RS=). Why do this? Some older car radios only show the PS field, so if you send the artist/title data to both PS and RT you will cover the widest number of radios out there. The PS field will scroll in 8 character chunks automatically on the radio.

RCS ZETTA & NEXGEN
The RDS metadata output is built into Zetta and an optional module for NexGen. Enter the IP address and UDP port number you have entered into the MP-532 into your RCS system.

Select the **UECP Unpacked** option on the MP-532.