

User's Manual

AutoConfig ARINC

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Introduction

1.1 What is AutoConfig ARINC?

AutoConfig ARINC is an application that provides the capability to create XML and text-based files for file-based channel configuration and scheduled message definition with the CEI-x30 product application programmer's interface.

AutoConfig ARINC's channel configuration feature can create transmit/receive channel configuration files for all ARINC 429 channels residing on a CEI-x30 ARINC 429 board. AutoConfig ARINC's scheduled message definition feature can create scheduled message definition files for all ARINC 429 transmit channels residing on a CEI-x30 ARINC 429 board.

1.2 System Requirements

Make sure that your PC (or compatible) and its software conforms to the following requirements and recommendations.

- A VGA (or better) graphics card and display is required. The recommended screen resolution is 1280x1024 (the minimum required screen resolution is 1024x768).
- Support Operating Systems: 32-bit and 64-bit Windows 10, 8.1, 8, 7, Vista, XP and Server 2012.

1.3 Starting the Program

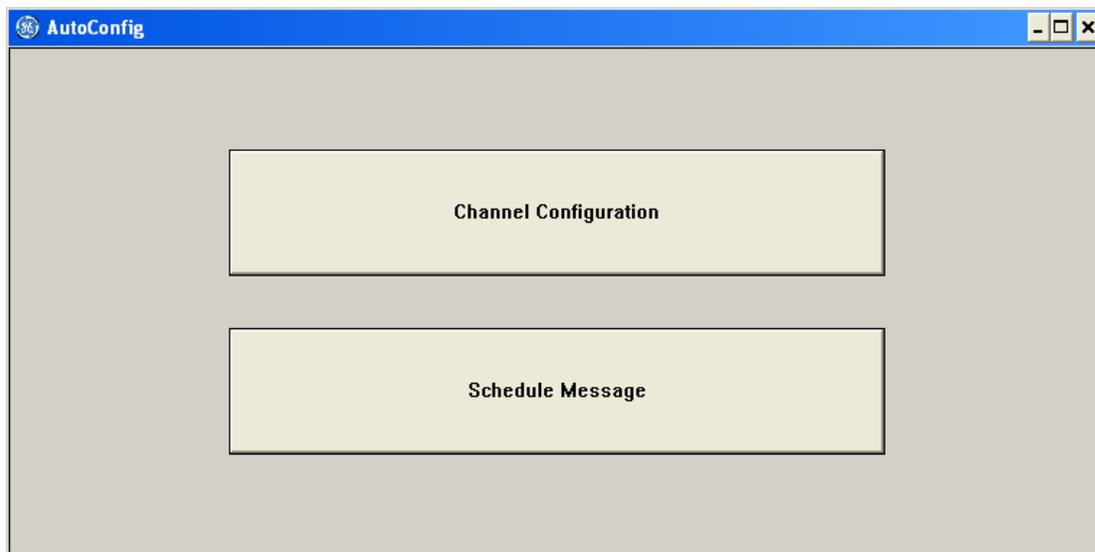
After installing LV-x30, you can start the AutoConfig ARINC program via the Start -> Programs -> LV-x30 -> AutoConfig shortcut.

AutoConfig ARINC Introduction

2.1 Overview

This chapter describes the program entry window, and shows how to enter the channel configuration page or/and schedule message page from the entry window.

When AutoConfig ARINC is launched, the entry window appears:



Click Channel Configuration enter the Channel Configuration panel.

File Operation (Channel Configuration)

Read From File Save To File Switch To Schedule Message

Board Information (Channel Configuration)

Board Index: Receive Channel Count: Transmit Channel Count: Set Board Information

Receive Channels Information (Channel Configuration)

Channel Index: <input type="text" value="0"/>	Bit Rate: <input type="text" value="100000"/>	Enable: <input type="text" value="ENABLED"/>	Parity Check: <input type="text" value="ENABLED"/>	Buffer Mode: <input type="text" value="INDIVIDUAL"/>	Internal Wrap: <input type="text" value="DISABLED"/>
Channel Index: <input type="text" value="1"/>	Bit Rate: <input type="text" value="100000"/>	Enable: <input type="text" value="ENABLED"/>	Parity Check: <input type="text" value="ENABLED"/>	Buffer Mode: <input type="text" value="INDIVIDUAL"/>	Internal Wrap: <input type="text" value="DISABLED"/>

Transmit Channels Information (Channel Configuration)

Channel Index: <input type="text" value="0"/>	Bit Rate: <input type="text" value="100000"/>	Enable: <input type="text" value="ENABLED"/>	Parity Injection: <input type="text" value="ODD"/>	Protocol Error: <input type="text" value="NONE"/>
Channel Index: <input type="text" value="1"/>	Bit Rate: <input type="text" value="100000"/>	Enable: <input type="text" value="ENABLED"/>	Parity Injection: <input type="text" value="ODD"/>	Protocol Error: <input type="text" value="NONE"/>

Click Schedule Message to enter the schedule message setup panel.

The screenshot shows a software window titled "AutoConfig(Schedule Message)". It is divided into several sections:

- File Operation [Schedule Message]:** Contains three buttons: "Read From File", "Save To File", and "Switch To Channel Configuration".
- Add Message [Schedule Message]:** Contains input fields for:
 - Equipment Type: "Undefined-ID : 0"
 - Parameter Name: (empty)
 - Message Content: (empty)
 - Board Index: "0"
 - Channel Index: "0"
 - Rate(ms): "100"
 - Start Offset (ms): "0"
 - Transmit Count: "-1"And an "Add Message" button.
- Message List [Schedule Message]:** A table with the following columns: Index, Equipment Type, Equipment ID, Parameter Name, Label Value(Octal), Message Content, Units, Board Index, Channel Index, Rate(ms), Start Offset(ms), and Transmit Count. The table is currently empty.
- Bottom Control:** An "Index:" label followed by an input field, and three buttons: "Modify", "Delete", and "Delete All".

Channel Configuration

3.1 Overview

The Channel Configuration display allows you to configure one or more ARINC 429 receive and/or transmit channels. The following channel configuration functions are described in this chapter:

Board Information Setup

Define Board Index, Receive and Transmit channel count (up to 16 transmit and 32 receive channels total).

Receive Channels Setup

This section defines Receive channel setup.

Transmit Channels Setup

This section defines Transmit channel setup.

File Operation

Read an existing configuration file, or save the current configuration to a file.

Switch to Schedule Message

This button allows you to switch to the Schedule Message panel.

3.2 Board Information Setup

Board Information (Channel Configuration)

Board Index : Receive Channel Count : Transmit Channel Count :

1. Define Board Index: Input a board index, the valid range is 0-15.
2. Define Receive and Transmit channel count. The valid Transmit Channel Count range is 0-16, while the valid Receive Channel Count range is 0-32.
3. Click "Set board Information".

3.3 Receive Channels Setup

The Receive Channels Information table allows you to set the following attributes on individual receive channels:

Channel Index	Valid range is 0 to the number of receivers -1 installed on the device.
Bit Rate	Bus Speed in Hertz, with a valid range from 200 to 150,000.
Buffer Enable	Receive Buffer Enable, with valid options of ENABLED or DISABLED.
Parity Check	Parity checking state for the receiver, with valid options of ENABLED or DISABLED.

Buffer Mode Receiver buffering mode, with valid options being INDIVIDUAL or MERGED.
 Internal Wrap Receiver internal wrap mode, with valid options of ENABLED or DISABLED.

Board Information (Channel Configuration)											
Board Index :	<input type="text" value="0"/>	Receive Channel Count :	<input type="text" value="8"/>	Transmit Channel Count :	<input type="text" value="2"/>	<input type="button" value="Set Board Information"/>					
Receive Channels Information (Channel Configuration)											
Channel Index :	<input type="text" value="0"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Check :	<input type="text" value="ENABLED"/>	Buffer Mode :	<input type="text" value="INDIVIDUAL"/>	Internal Wraps :	<input type="text" value="DISABLED"/>
Channel Index :	<input type="text" value="1"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Check :	<input type="text" value="ENABLED"/>	Buffer Mode :	<input type="text" value="INDIVIDUAL"/>	Internal Wraps :	<input type="text" value="DISABLED"/>
Channel Index :	<input type="text" value="2"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Check :	<input type="text" value="ENABLED"/>	Buffer Mode :	<input type="text" value="INDIVIDUAL"/>	Internal Wraps :	<input type="text" value="DISABLED"/>
Channel Index :	<input type="text" value="3"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Check :	<input type="text" value="ENABLED"/>	Buffer Mode :	<input type="text" value="INDIVIDUAL"/>	Internal Wraps :	<input type="text" value="DISABLED"/>
Channel Index :	<input type="text" value="4"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Check :	<input type="text" value="ENABLED"/>	Buffer Mode :	<input type="text" value="INDIVIDUAL"/>	Internal Wraps :	<input type="text" value="DISABLED"/>

1. If the receive channel count is defined as N (2 to 32), the default channel index will increment from 0 to N-1. You can set the channel index to any value you need, and click “Set board information” to save the modified information.

Note: The Channel Index value range is 0 to 31, and should not be repeated.

2. Set Bit Rate, while typical ARINC 429 bit rates are 12500 or 100000, the valid range is 200-150000.
3. Set Channel Enable to either ENABLED or DISABLED, indicating the resulting operational state of this channel’s buffering mechanism. Active message logging only occurs when the channel is ENABLED.
4. Set Parity Check to either ENABLED or DISABLED, indicating the resulting operational state of receiver parity checking. When ENABLED, the parity of the received message will be checked and indicated as valid in B31 of the 32-bit ARINC 429 message value with a bit state of ‘0’. A message detected as having an invalid parity bit will be indicated with a bit state of ‘1’.
5. Set Buffer Mode to INDIVIDUAL or MERGED, indicating the active buffer mode for this channel. When set to MERGED, received messages are logged to a separate merged receive buffer with all other channels set for merged buffer mode, in an as-received order.
6. Set Internal Wrap selection to ENABLED or DISABLED, indicating the resulting self-test wrap state applied to this receive channel.
7. Click “Set Board Information” to save the information internally for the duration of this program’s execution.

3.4 Transmit Channels Setup

The Transmit Channels information table allows you to set the following attributes on individual transmit channels:

Channel Index	Valid range is zero to the number of transmitters - 1 installed on the device.
Bit Rate	Bus Speed in Hertz, with a valid range from 200 to 150,000.
Buffer Enable	Transmit Buffer Enable, with valid options of ENABLED or DISABLED.
Parity Check	Parity assignment for the transmitter, with valid options of ODD, EVEN or NONE.
Protocol Error	Transmitter error injection selection, with valid options of NONE, BIT COUNT HIGH, BIT COUNT LOW, and GAP ERROR

Transmit Channels Information (Channel Configuration)									
Channel Index :	<input type="text" value="0"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Injection :	<input type="text" value="ODD"/>	Protocol Error :	<input type="text" value="NONE"/>
Channel Index :	<input type="text" value="1"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Injection :	<input type="text" value="ODD"/>	Protocol Error :	<input type="text" value="NONE"/>
Channel Index :	<input type="text" value="2"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Injection :	<input type="text" value="ODD"/>	Protocol Error :	<input type="text" value="NONE"/>
Channel Index :	<input type="text" value="3"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Injection :	<input type="text" value="ODD"/>	Protocol Error :	<input type="text" value="NONE"/>
Channel Index :	<input type="text" value="4"/>	Bit Rate :	<input type="text" value="100000"/>	Enable :	<input type="text" value="ENABLED"/>	Parity Injection :	<input type="text" value="ODD"/>	Protocol Error :	<input type="text" value="NONE"/>

1. If the transmit channel count is defined as N (2 to 16), the default channel index will increment from 0 to N-1. You can set the channel index to any value you need, and click “Set board information” to save the modified information.

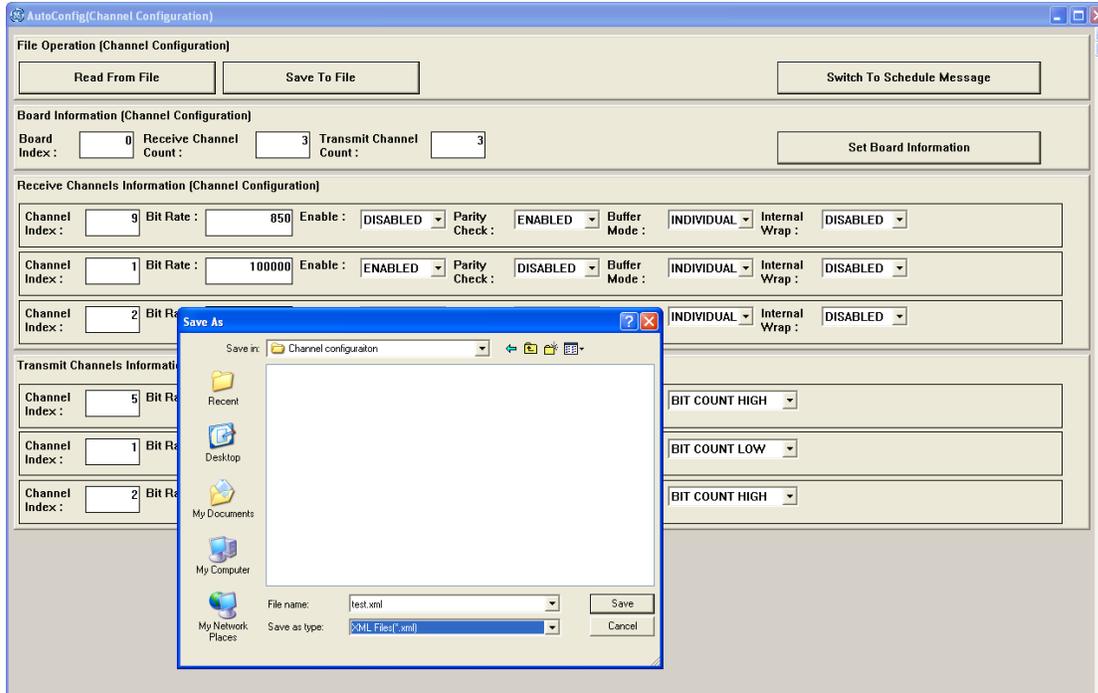
Note: The Channel Index value range is 0 to 15, and should not be repeated.

2. Set Bit Rate, while typical ARINC 429 bit rates are 12500 or 100000, the valid range is 200-150000.
3. Set Channel Enable to either ENABLED or DISABLED, indicating the resulting operational state of this channel’s transmit mechanism. Active message transmission only occurs when the channel is ENABLED.
4. Set Parity Injection to ODD, EVEN, NONE, indicating the type of parity to be assigned to each ARINC 429 message by the transmitter.
5. Set Protocol Error to NONE, BIT COUNT HIGH, BIT COUNT LOW or SHORT GAP, indicating the state and format of the ARINC 429 protocol error injection inserted with each message transmitted on this channel. A selection of NONE will transmit ARINC 429 normally; BIT COUNT HIGH will result in messages transmitted with a bit count of 33 bits; BIT COUNT LOW will result in messages transmitted with a bit count of 31 bits; SHORT GAP will result in an insertion of only 3 bits between subsequent messages inserted into the transmit buffer.
6. Click “Set Board Information” to save the information internally for the duration of this program’s execution.

3.5 File Operation

1. Save current configuration information to a file (xml or text): Click “Save To File” →input a file name→select a save type (txt or xml) →Click “Save.

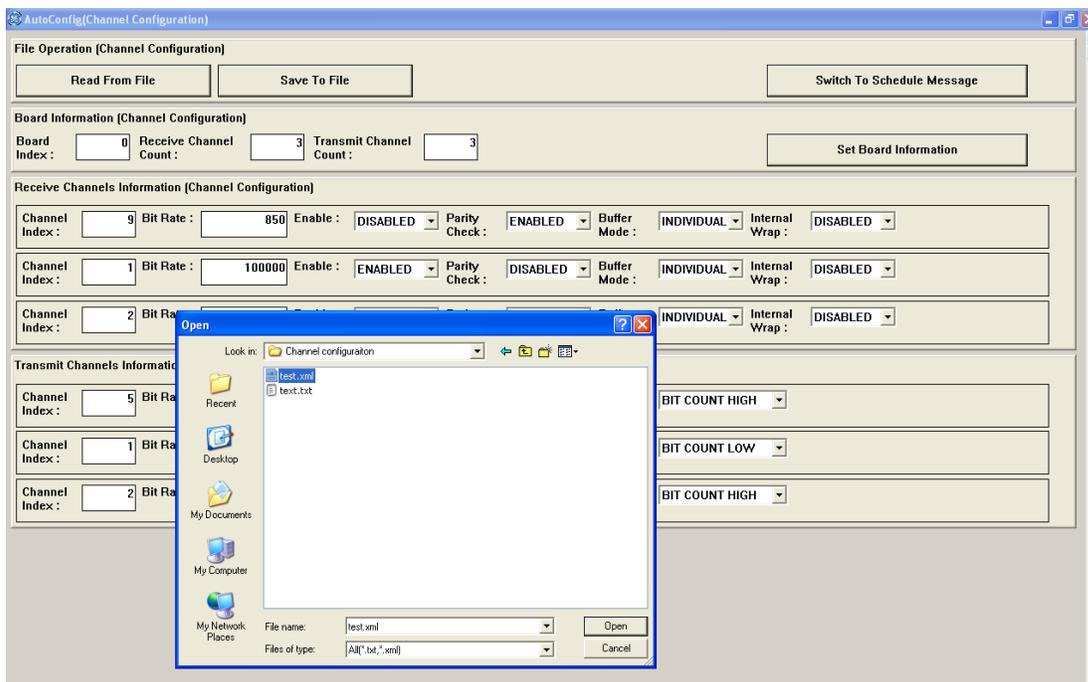
Note: a. If you do not choose a specific file type, the configuration file will be saved as a text file.
b. If a warning window displayed, the file cannot be saved successfully. First modify the setting according to warning feedback, then save the file again.



2. Read an existing file:

Click “Read from file” → choose a txt or xml file you desire to open → Click “Open”. The file information will be loaded successfully. You can then modify the configuration using tool bars.

Note: If a warning window is displayed, the file cannot be read successfully. First modify the errors according to warning feedback, and then read the file again



3.6 Switch to Schedule Message

To switch to the schedule message panel from the channel configuration panel, Click “Switch to Schedule Message”.



Managing Scheduled Messages

4.1 Overview

The Schedule Message feature allows you to define one or more ARINC 429 messages for one or more transmit channels. The following message schedule definition functions are described in this chapter:

Create Messages

To define how to add one or more scheduled messages for transmit channels.

Modify a Message

This section allows you to modify the message in the message list.

Delete One or All Messages

This section allows you to delete one or all messages from the message list.

File Operation

Read an existing scheduled message file, or save the current schedule message definition to a file.

Switch to Channel Configuration

This button allows you to switch to the Channel Configuration window

4.2 Create Messages

This function allows you to add messages with either an undefined message type or defined message type for defined transmit channels.

Add Message [Schedule Message]											
Equipment Type:	Undefined-ID : 0			Parameter Name :				Message Content :	0x [] []		
Board Index :	[0]	Channel Index :	[0]	Rate(ms):	[100]	Start Offset (ms) :	[0]	Transmit Count :	[-1]	Add Message	
Message List [Schedule Message]											
Index	Equipment Type	Equipment ID	Parameter Name	Label Value	Message Content	Units	Board Index	Channel Index	Rate(ms)	Start Offset(ms)	Transmit Count

1. Select a defined or undefined Equipment Type.

Message List [Schedule Message]

Index	Equipment Type	Equipment ID	Parameter Name	Label Value(Octal)	Message Content	Units	Board Index	Channel Index	Rate(ms)	Start Offset(ms)	Transmit Count
0	Flight Managemen...	2	Distance to go	1	55.0	N.M.	0	0	100	0	-1
1	Flight Managemen...	2	Cross track distance	3	4.0	N.M.	0	0	100	0	-1
2	Flight Managemen...	2	Wind Speed	15	8	Knots	0	0	100	0	-1
3	Flight Managemen...	2	DME Frequency	35	8.0	MHZ	0	0	100	0	-1
4	Flight Managemen...	2	DME Frequency	35	8.0	MHZ	0	0	100	0	-1
5	Flight Managemen...	2	DME Frequency	35	8.0	MHZ	0	0	100	0	-1
6	Flight Managemen...	2	DME Frequency	35	8.0	MHZ	0	0	100	0	-1
7	Flight Managemen...	2	DME Frequency	35	8.0	MHZ	0	0	100	0	-1
8	Flight Managemen...	2	DME Frequency	35	8.0	MHZ	0	0	100	0	-1
9	Flight Managemen...	2	DME Frequency	35	8.0	MHZ	0	0	100	0	-1
10	Flight Managemen...	2	Estimated Time of ...	56	46.0	Hr:Min	0	0	100	0	-1
11	Flight Managemen...	2	Estimated Time of ...	56	46.0	Hr:Min	0	0	100	0	-1
12	Flight Managemen...	2	Estimated Time of ...	56	46.0	Hr:Min	0	0	100	0	-1

Message Modification

Equipment Type: Flight Management Computer [702]-ID : 2 Parameter Name : Estimated Time of Arrival-Lbl[Oct] : 56 Message Content : Hr:Min

Board Index : Channel Index : Rate(ms) : Start Offset (ms) : Transmit Count :

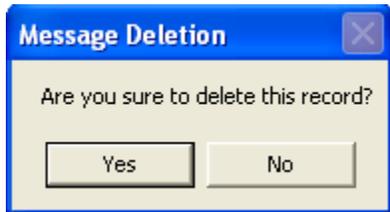
Index :

Input a desired message index in Index table, click "Modify", or select a record line and double click using the left mouse button.

4.4 Delete One or All Messages

1. To delete a signal scheduled message:

Input a desired message index in Index table, click "Delete". Or select a record line and double click using the right mouse button → click "Yes" for message deletion window.

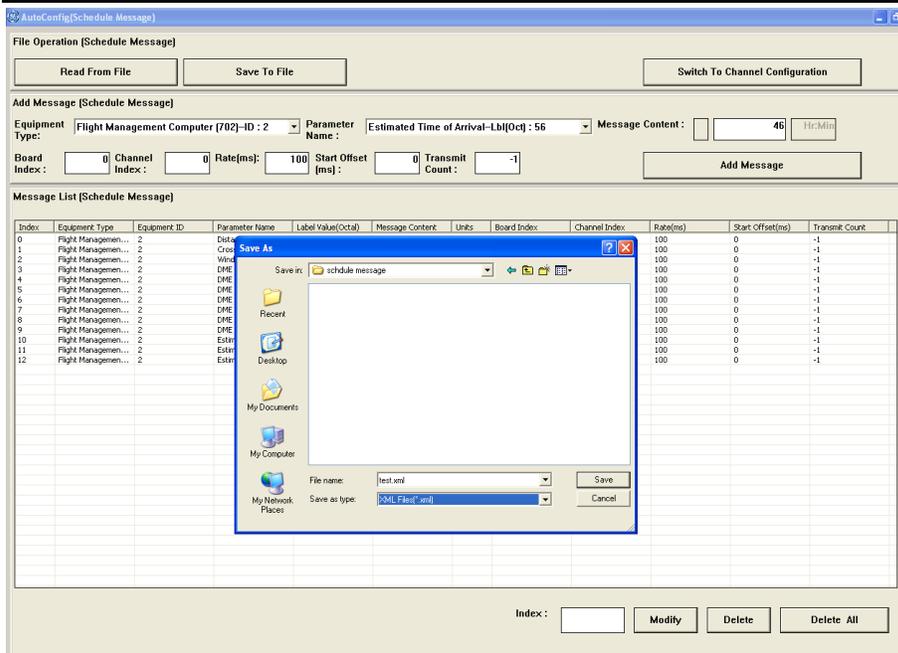


2. To delete all scheduled message entries, click "Delete All".

4.5 File Operation

1. Save current scheduled message information to a file (xml or text): Click “Save To File” →input a file name→select a save type (txt or xml) →Click “Save”.

Note: a. If you do not choose a specific file type, the message file will be saved as a text file.
b. If a warning window displayed, the file cannot be saved successfully. First modify the setting according to warning feedback, then save the file again.

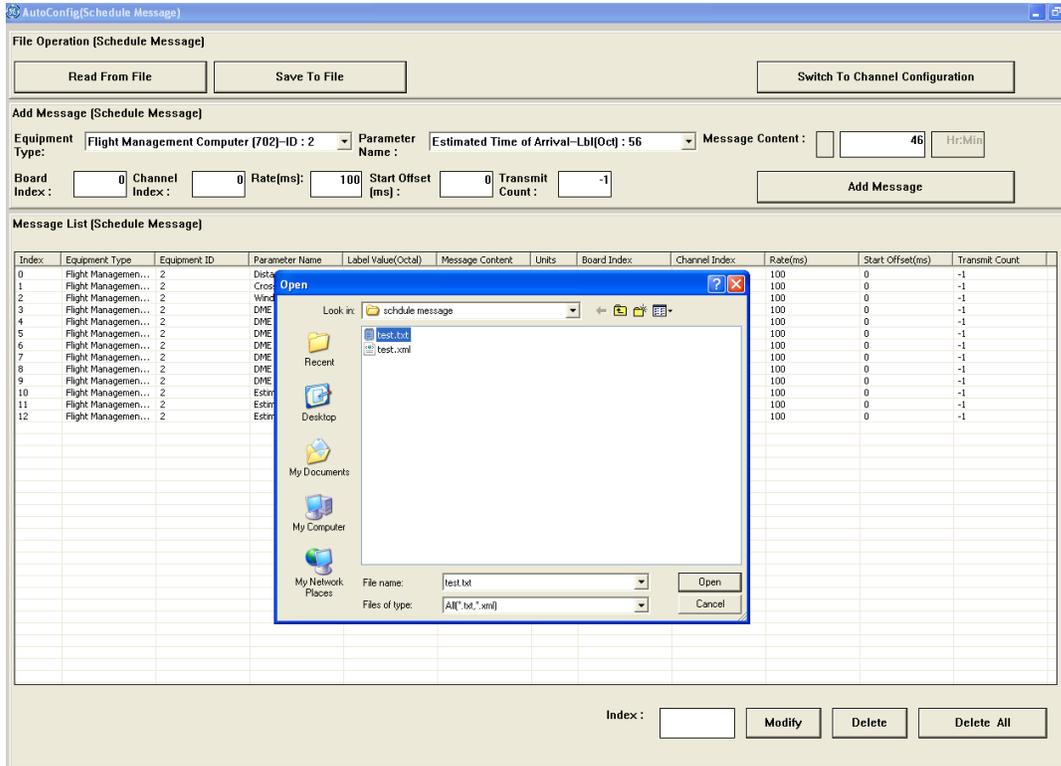


2. Load an existing scheduled message file:

Click “Read From File” →choose a txt or xml file you desire to open →Click “Open”.

The messages defined in the file are loaded in the message list as current scheduled messages; you can add more messages or modify current messages using the tool bars.

Note: If warning window is displayed, the file cannot be read successfully. First modify the errors according to warning feedback, and then read the file again



4.6 Switch to Channel Configuration

To switch to the channel configuration panel from the schedule message panel, Click “Switch to Channel Configuration”.



Configuration File Formats

5.1 Overview

The output file formats supported by AutoConfig ARINC are standard ASCII character based files using proprietary text or XML formatting. The supported file extensions are .txt for text configuration files and .xml for XML configuration files. The format of these files is provided in the following paragraphs.

5.2 Channel Configuration Text File Format

The format of the Channel Configuration text file is described in the following paragraphs. A sample Channel Configuration Text File is shown below:

```
Board Index:1
RxChannel Number:16
TxChannel Number:16
<RxChannel
ChannelIndex:0__Enable:ENABLED__BitRate:100000__ParityCheck:DISABLED__BufferMode:MERGED__InternalWrap:ENABLED
ChannelIndex:1__Enable:ENABLED__BitRate:12500__ParityCheck:ENABLED__BufferMode:INDIVIDUAL__InternalWrap:ENABLED
ChannelIndex:2__Enable:ENABLED__BitRate:12500__ParityCheck:ENABLED__BufferMode:INDIVIDUAL__InternalWrap:DISABLED
ChannelIndex:3__Enable:DISABLED__BitRate:100000__ParityCheck:ENABLED__BufferMode:INDIVIDUAL__InternalWrap:DISABLED
ChannelIndex:4__Enable:DISABLED__BitRate:100000__ParityCheck:ENABLED__BufferMode:INDIVIDUAL__InternalWrap:DISABLED
RxChannel>
<TxChannel
ChannelIndex:0__Enable:ENABLED__BitRate:100000__ParityCheck:NONE__ProtocolError:NONE
ChannelIndex:1__Enable:ENABLED__BitRate:12500__ParityCheck:ODD__ProtocolError:NONE
ChannelIndex:2__Enable:ENABLED__BitRate:12500__ParityCheck:ODD__ProtocolError:NONE
ChannelIndex:3__Enable:DISABLED__BitRate:100000__ParityCheck:EVEN__ProtocolError:BIT COUNT HIGH
ChannelIndex:4__Enable:DISABLED__BitRate:100000__ParityCheck:ODD__ProtocolError:BIT COUNT LOW
TxChannel>
```

5.2.1 Board Index

The Board Index entry indicates the Board Index selected when AutoConfig ARINC saved the respective Channel Configuration text file, for reference only by the AutoConfig ARINC program. The value is not used

when programming a board from the configuration file, as it is superseded by the board index parameter passed into the API routine. The format of this first line in the text configuration file is:

Board Index:N

where N has a valid range of 0 to 15.

5.2.2 Receive Channel Entry Count

The receive channel entry count indicates the number of receive channel attribute entries to actually program on the board, regardless of how many receive channel attribute entries are defined in the configuration file. The token format for Receive Channel Count entry occupies a single line as follows:

RXChannel Number:N

where N has a valid range of 0 to the total number of receive channels installed on the board.

5.2.3 Transmit Channel Entry Count

The transmit channel entry count indicates the number of transmit channel attribute entries to actually program on the board, regardless of how many transmit channel attribute entries are defined in the configuration file. The token format for Transmit Channel Count entry occupies a single line as follows:

TXChannel Number:N

where N has a valid range of 0 to the total number of transmit channels installed on the board.

5.2.4 Receive Channel Attribute Entry

The start of the Receive Channel Attribute Entry section is designated by the following token placed on a single line:

<RxChannel

Each subsequent Receive Channel Attribute Entry following the start token uses the following configuration field and value formats, with channel attribute entries delimited by at least one underscore character '_':

Attribute	Entry Format	Definition and Options
CHANNEL NUMBER	ChannelIndex:0	Valid range is 0 to 'number of receivers' – 1 Does not have to be in an increasing order, but should not repeat channel index values.
CHANNEL ENABLE	Enable:ENABLED	Valid options are ENABLED or DISABLED Determines the active state of the channel.
CHANNEL BUS SPEED	BitRate:100000	Valid range is 200 to 150000 Specifies the channel bus speed in Hertz.

CHANNEL PARITY	ParityCheck:ENABLED	Valid options are ENABLED or DISABLED Specifies the state of receiver parity checking.
RECEIVER BUFFER MODE	BufferMode:INDIVIDUAL	Valid options are INDIVIDUAL or MERGED Specifies whether messages are logged in the individual buffer or the merged buffer.
RECEIVER INTERNAL WRAP	InternalWrap:ENABLED	Valid options are ENABLED or DISABLED Specifies whether or not internal wrap is applied.

The end of the Receive Channel Attribute Entry section is designated by the following token placed on a single line:

RxChannel>

5.2.5 Transmit Channel Attribute Entry

The start of the Transmit Channel Attribute Entry section is designated by the following token placed on a single line:

<TxChannel

Each subsequent Transmit Channel Attribute Entry following the start token uses the following configuration field and value formats, with channel attribute entries delimited by at least one underscore character ‘_’:

Attribute	Entry Format	Definition and Options
CHANNEL NUMBER	ChannelIndex:0	Valid range is 0 to ‘number of transmitters’ – 1 Does not have to be in an increasing order, but should not repeat channel index values.
CHANNEL ENABLE	Enable:ENABLED	Valid options are ENABLED or DISABLED Determines the active state of the channel.
CHANNEL BUS SPEED	BitRate:100000	Valid range is 200 to 150000 Specifies the channel bus speed in Hertz.
CHANNEL PARITY	ParityCheck:ODD	Valid options are ODD, EVEN, or NONE Specifies the state of the transmitter parity override and the value assigned to Bit 32 of each ARINC 429 message transmitted on this channel.
ERROR INJECTION	ProtocolError:NONE	Valid options are NONE, BIT COUNT HIGH, BIT COUNT LOW, or SHORT GAP. Specifies whether or not a protocol error is applied, and what type is applied, to each ARINC 429 message transmitted on this channel.

The end of the Transmit Channel Attribute Entry section is designated by the following token placed on a single line:

TxChannel>

5.3 Channel Configuration XML File Format

The format of the Channel Configuration XML file is described in the following paragraphs. The entirety of the entries inserted in the XML file is encapsulated between the file header lines:

```
<?xml version="1.0" encoding="utf-16" ?>  
<x30boardconfig xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation  
    ="channelconfig.xsd">
```

and the file terminating line:

```
</x30boardconfig>
```

5.3.1 Board Index

The Board Index entry indicates the Board Index selected when AutoConfig ARINC saved the respective Channel Configuration text file, for reference only by the AutoConfig ARINC program. The value is not used when programming a board from the configuration file, as it is superseded by the board index parameter passed into the API routine. The format of this first line in the text configuration file is:

```
<boardindex>N</boardindex>
```

where N has a valid range of 0 to 15.

5.3.2 Receive Channel Entry Count

The receive channel entry count indicates the number of receive channel attribute entries to actually program on the board, regardless of how many receive channel attribute entries are defined in the configuration file. The token format for Receive Channel Count entry occupies a single line as follows:

```
<rxchannelnum>N</rxchannelnum>
```

where N has a valid range of 0 to the total number of receive channels installed on the board.

5.3.3 Transmit Channel Entry Count

The transmit channel entry count indicates the number of transmit channel attribute entries to actually program on the board, regardless of how many transmit channel attribute entries are defined in the configuration file. The token format for Transmit Channel Count entry occupies a single line as follows:

`<txchannelnum>N</txchannelnum>`

where N has a valid range of 0 to the total number of transmit channels installed on the board.

5.3.4 Receive Channel Attribute Entry

The start of the Receive Channel Attribute Entry section is designated by the following token placed on a single line:

`<rxchannelgroup>`

Each subsequent Receive Channel Attribute Entry following the start token uses the following configuration field and value formats, with channel attribute entries organized beneath the ENTRY INDEX (rxchannel index) group token:

Attribute	Entry Format	Definition and Options
ENTRY INDEX	<code><rxchannel index="0"></code>	Valid range is 0 to 1 less than the value supplied for Receive Channel Entry Count
CHANNEL NUMBER	<code><channelindex>0</channelindex></code>	Valid range is 0 to 'number of receivers' – 1. Does not have to be in an increasing order, but should not repeat channel index values.
CHANNEL ENABLE	<code><enable>ENABLED</enable></code>	Valid options are ENABLED or DISABLED. Determines the active state of the channel.
CHANNEL BUS SPEED	<code><bitrate>100000</bitrate></code>	Valid range is 200 – 150000. Specifies the channel bus speed in Hertz.
CHANNEL PARITY	<code><rxparity>ENABLED</rxparity></code>	Valid options are ENABLED or DISABLED. Specifies the state of receiver parity checking.
RECEIVER BUFFER MODE	<code><buffermode>INDIVIDUAL</buffermode></code>	Valid options are INDIVIDUAL or MERGED.

RECEIVER INTERNAL WRAP	<code><internalwrap>ENABLED</internalwrap></code>	Specifies whether messages are logged in the individual buffer or the merged buffer. Valid options are ENABLED or DISABLED.
END OF ENTRY	<code></rxchannel></code>	Specifies whether or not internal wrap is applied. Designates end of this entry.

The end of the Receive Channel Attribute Entry section is designated by the following token placed on a single line:

`</rxchannelgroup>`

5.3.5 Transmit Channel Attribute Entry

The start of the Transmit Channel Attribute Entry section is designated by the following token placed on a single line:

`<txchannelgroup>`

Each subsequent Transmit Channel Attribute Entry following the start token uses the following configuration field and value formats, with channel attribute entries placed on individual lines:

Attribute	Entry Format	Definition and Options
ENTRY INDEX	<code><txchannel index="0"></code>	Valid range is 0 to 1 less than the value supplied for Transmit Channel Entry Count.
CHANNEL NUMBER	<code><channelindex>0</channelindex></code>	Valid range is 0 to 'number of transmitters' - 1. Does not have to be in an increasing order, but should not repeat channel index values.
CHANNEL ENABLE	<code><enable>ENABLED</enable></code>	Valid options are ENABLED or DISABLED. Determines the active state of the channel.
CHANNEL BUS SPEED	<code><bitrate>100000</bitrate></code>	Valid range is 200 - 150000. Specifies the channel bus speed in Hertz.
CHANNEL PARITY	<code><rxparity>ODD</rxparity></code>	Valid options are ODD,

ERROR INJECTION	<code><protocolerror>NONE</protocolerror></code>	Valid options are NONE, BIT COUNT HIGH, BIT COUNT LOW, or SHORT GAP. Specifies whether or not a protocol error is applied, and what type is applied, to each ARINC 429 message transmitted on this channel.
END OF ENTRY	<code></txchannel></code>	Designates end of this entry.

The end of the Transmit Channel Attribute Entry section is designated by the following token placed on a single line:

`</txchannelgroup>`

5.4 Scheduled Message Definition Text File Format

The format of the Scheduled Message Definition text file is described in the following paragraphs. A sample Scheduled Message Definition Text File is shown below:

```

MessageNumber:4
<MessageGroup
MessageIndex:0__BoardIndex:0__ChannelIndex:0__MessageContext:0x4099999__Rate:200__StartOffset:0__TransmitCount:-1__EquipmentID:0
MessageIndex:1__BoardIndex:0__ChannelIndex:1__MessageContext:0X4801c__Rate:10__StartOffset:0__TransmitCount:-1__EquipmentID:6
MessageIndex:2__BoardIndex:0__ChannelIndex:2__MessageContext:0X84000d__Rate:100__StartOffset:0__TransmitCount:-1__EquipmentID:4
MessageIndex:3__BoardIndex:0__ChannelIndex:3__MessageContext:0X6000b83d__Rate:100__StartOffset:0__TransmitCount:-1__EquipmentID:11
MessageGroup>

```

5.4.1 Message Definition File Entry Count

The message definition entry count indicates the number of scheduled message entries to actually program on the board, regardless of how many message definition entries are defined in the file. The token format for Message Definition File Entry Count entry occupies a single line as follows:

MessageNumber:N

where N has a valid range of 0 to 999.

5.4.2 Message Definition Entry

The start of the Message Definition Entry section is designated by the following token placed on a single line:

<MessageGroup

Each subsequent Message Definition Attribute Entry following the start token uses the following token field and value formats, with each token entry delimited by at least one underscore character ‘_’:

Attribute	Entry Format	Definition and Options
MESSAGE INDEX	MessageIndex:0	Valid range is 0 to ‘message definition entry count’ - 1, should be in an increasing order, and should not repeat values.
BOARD INDEX	BoardIndex:0	Valid range is 0 to 15, limited by the number of CEI-x30 boards installed in the system.
CHANNEL INDEX	ChannellIndex:0	Valid range is 0 to 1 less than the number of transmitters installed on the board referenced by the value of for the BoardIndex token.
MESSAGE VALUE	MessageContext:0X6000403c	Defines the initial value of the ARINC 429 message to be transmitted, limited to a 32-bit number in hex representation, not case sensitive.
RETRANSMIT RATE	Rate:100	Valid range is 1 to 9999999, having a resolution of 1 millisecond. Specifies the periodic retransmission rate of the ARINC 429 message.
START OFFSET	StartOffset:0	Valid range is 1 to 9999999, having a resolution of 1 millisecond. Specifies the offset from the point in which the board is enabled when periodic retransmission of the ARINC 429 message begins.
TRANSMIT COUNT	TransmitCount:-1	Valid range is -1 to 9999999. This count defines the number of instances this message is transmitted on the bus. A value of -1 assigns the message to be transmitted infinitely while the board is enabled.
EQUIPMENT ID	EquipmentID:2	The equipment ID is only used by the AutoConfig ARINC program to present the ARINC 429 MESSAGE VALUE in terms of engineering value based on the

message label. This value is unused by the CEI-x30 API and board.

The end of the Message Definition Entry section is designated by the following token placed on a single line:

MessageGroup>

5.5 Scheduled Message Definition XML File Format

The format of the Channel Configuration XML file is described in the following paragraphs. The entirety of the entries inserted in the XML file is encapsulated between the file header lines:

```
<?xml version="1.0" encoding="utf-16" ?>  
<x30schedulemessage xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
    xsi:schemaLocation ="schedulemessage.xsd">
```

and the file terminating line:

```
</x30schedulemessage>
```

5.5.1 Message Definition File Entry Count

The message definition entry count indicates the number of scheduled message entries to actually program on the board, regardless of how many message definition entries are defined in the file. The token format for Message Definition File Entry Count entry occupies a single line as follows:

```
<messagenumber>8</messagenumber>
```

where N has a valid range of 0 to 999.

5.5.2 Message Definition Entry

The start of the Message Definition Entry section is designated by the following token placed on a single line:

```
<messagegroup>
```

Each subsequent Message Definition Attribute Entry following the start token uses the following token field and value formats, with message definition entries organized beneath the MESSAGE INDEX (message index) group token:

Attribute	Entry Format	Definition and Options
MESSAGE INDEX	<code><message index="0"></code>	Valid range is 0 to 'message definition entry count' - 1, should be in an increasing order, and should not repeat values.
BOARD INDEX	<code><boardindex>0</boardindex></code>	Valid range is 0 to 15, limited by the number of CEI-x30 boards installed in the system.
CHANNEL INDEX	<code><channelindex>0</channelindex></code>	Valid range is 0 to 1 less than the number of transmitters installed on the board referenced by the value of for the BoardIndex token.
MESSAGE VALUE	<code><messagecontent>0X6000b83d</messagecontent></code>	Defines the initial value of the ARINC 429 message to be transmitted, limited to a 32-bit number in hex representation, not case sensitive.
RETRANSMIT RATE	<code><rate>200</rate></code>	Valid range is 1 to 9999999, having a resolution of 1 millisecond. Specifies the periodic retransmission rate of the ARINC 429 message.
START OFFSET	<code><startoffset>0</startoffset></code>	Valid range is 1 to 9999999, having a resolution of 1 millisecond. Specifies the offset from the point in which the board is enabled when periodic retransmission of the ARINC 429 message begins.
TRANSMIT COUNT	<code><transmitcount>-1</transmitcount></code>	Valid range is -1 to 9999999. This count defines the number of instances this message is transmitted on the bus. A value of -1 assigns the message to be transmitted infinitely while the board is enabled.
EQUIPMENT ID	<code><equipementid>6</equipementid></code>	The equipment ID is only used by the AutoConfig ARINC program to present the ARINC 429 MESSAGE VALUE in terms of engineering value based on the message label. This value is unused by the CEI-x30 API and board.

The end of the Receive Channel Attribute Entry section is designated by the following token placed on a single line:

`</message>`