

Partner: L-Acoustics
Model: LA7.16i
Device Type: Amplified Controller 16ch (Advanced)



GENERAL INFORMATION

SIMPLWINDOWS NAME:	L-Acoustics Amplified Controller 16ch Advanced
CATEGORY:	MULTI-CHANNEL AUDIO AMPLIFIER
VERSION:	V3.5.0
SUMMARY:	The module provides the major control and preset functions via TCP/IP.
GENERAL NOTES:	<p>This module is for the control of LA7.16i Amplified Controllers.</p> <p>Each Amplifier to be connected and controlled will require one complete module assigned to it. Each module should therefore use unique digital, analog and serial joins. The simplest way of achieving this is to use a unique prefix which identifies the amplifier such as AMP1_MUTE and AMP2_MUTE.</p> <p>The module features error/status messaging that is designed to comply with the regulations regarding fault monitoring set in EN 60849.</p>
CRESTRON HARDWARE REQUIRED:	C3ENET, 3-Series Processor, 4-Series Processor
SETUP OF CRESTRON HARDWARE:	<p>The Crestron Control Processor's IP address usually is in the same subnet as the Amplified Controllers (typically 192.168.1.x/255.255.255.0, but other classes are possible, see amplified controller user manual).</p> <p>It is possible to use IP routing between the Crestron Control Processor and the Amplified Controllers, provided that the IP gateway parameter is correctly set on the Amplified Controllers.</p>
VENDOR FIRMWARE:	LA7.16i minimum firmware version: 2.12.0 Maximum firmware version: 2.14.x
VENDOR SETUP:	Amplified Controller connected to the Ethernet Network

SUPPORT CONTACT

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RELEASE NOTES

- **Version 3.5.0** (October 2024)

New features/Improvements

CRES-42	Support of firmware 2.14.x
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Fixed issues

n/a

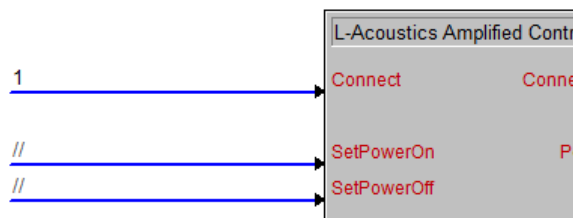
Versions History

- **Version 3.4.2** (February 2024)
 - Support firmware 2.13.x
 - New configurations slot 9 and 10
- **Version 3.4.1** (Hotfix – January 2023)
- **Version 3.4.0** (January 2023)
 - Improved performance and stability
- **Version 3.3.0** (July 2022)

Initial release

GENERAL INFORMATION

- Standard signals "1" and "0"



It is possible to use the standard "1" signal on all digital inputs of the module, especially on the **Connect** input. This will have the effect of instantly connect the module at program startup (for **Connect** input), or send the associated command as soon as the module connection is established (for other digital inputs).

This is also true for analog initialized signals.

However, the stand signal "0" cannot be used to automatically trigger the falling edge of a command. Using "0" on an input has the same effect as commenting "//" the input.

- Configurations

Configurations are a concept that was designed for fixed installations situations to be able to load multiple tunings of a system when LA Network Manager is not used and not connected. Each amplified controller contains 8 memory slots for Configurations.

Procedure to store a configuration:

- 1) connect the CRESTRON L-Acoustics module to the amplified controller(s),
- 2) using LA Network Manager, load the desired Session file to the amplified controller(s),
- 3) using the CRESTRON L-Acoustics module:
 - o select the desired Configuration memory slot index,
 - o enter the desired name for the Configuration (optional),
 - o store the Configuration,
- 4) repeat steps 2) and 3) for each LA Network Manager Session file to save as a Configuration.

Important note

User Layouts and Configuration memory slots are **erased when updating the amplified controller's firmware**. Make sure the LA Network Manager reference Session files used for storing Configurations are properly archived and available in case Configurations need to be stored again into the amplified controller's memory.

Also, prevent the program end-users from overwriting the Configurations by mistake

CONTROL	
Connect	<p>The Connect signal is used to activate the functions of the module.</p> <p>D As soon as this signal is HIGH, the module tries to connect to the amplified controller over TCP/IP. When the connection is successful, all other input signals are effective. When the signal is LOW, the TCP/IP connection gets closed, and input signals become ineffective.</p>
SetPowerOn SetPowerOff	<p>SetPowerOn and SetPowerOff react to rising edges.</p> <p>D Setting these signals HIGH respectively turns the amplified controller into either Online state or Standby state. Of course, it cannot be in both states at the same time, so the latest rising edge will prevail. The current power state is exposed through the Power digital output signal.</p>
LockDisplay UnlockDisplay	<p>LockDisplay and UnlockDisplay react to rising edges.</p> <p>D Setting these signals HIGH respectively locks and unlocks the front panel buttons and touch screen gestures of the amplified controller. The current state of display lock is exposed by the DisplayLocked digital output signal.</p>
SelectUserLayoutNumber#	<p>SelectUserLayoutNumber# accepts values between 1 and 10.</p> <p>When changing this value, if a user layout is available in the corresponding layout slot, it is then pre-selected for loading it using the LoadSelectedUserLayout digital input signal. When a user layout is selected, its number and name are written to the SelectedLayoutOrConfigName\$ serial output signal.</p> <p>Setting this signal to 0 clears the user layout selection.</p>
SelectConfigNumber#	<p>SelectConfigNumber# accepts values between 1 and 8.</p> <p>When changing this value, if a valid configuration is available in the corresponding configuration slot, it is then pre-selected for loading it using the LoadSelectedLayoutOrConfig digital input signal. When a valid configuration is selected, its number and name are written to the SelectedLayoutOrConfigName\$ serial output signal.</p> <p>It is also allowed to select an existing or empty configuration slot in order to save a new configuration using the SaveSelectedConfig digital input signal.</p> <p>Setting this signal to 0 clears the configuration selection.</p>

LoadSelectedLayoutOrConfig	D	<p>LoadSelectedLayoutOrConfig reacts to rising edges.</p> <p>If a valid user layout or configuration has been selected using the SelectUserLayoutNumber# or the SelectConfigNumber# digital input signals, then setting this signal HIGH loads the selected user layout or configuration onto the amplified controller. The selected user layout or configuration then becomes the current layout, and its number and name are written to the CurrentLayoutName\$ serial output signal.</p> <p>This signal has no effect if the amplified controller is currently controlled by LA Network Manager.</p>
SetConfigNameToSave\$	S	<p>SetConfigNameToSave\$ allows to enter a custom name for the target Configuration memory slot before storing it using the SaveSelectedConfig digital input signal.</p> <p><u>Notes</u></p> <ul style="list-style-type: none"> - If this field is not entered (empty value), an automatic configuration name is generated using the memory slot index. - Use only ASCII characters. - The name is truncated to the 16 first characters.
SaveSelectedConfig	D	<p>SaveSelectedConfig reacts to rising edges.</p> <p>The current layout (enclosures, mute, gain, delay, polarity) and group parameters (EQ, Array Morphing) of the amplified controller are stored in the configuration slot number exposed by the SelectedConfigNumber# digital output signal. The new configuration name is determined by the last value sent to the SetConfigNameToSave\$ serial input signal.</p>
SetMasterMuteOn SetMasterMuteOff	D	<p>SetMasterMuteOn and SetMasterMuteOff react to rising edges.</p> <p>These signals have a different behavior than MuteAll and UnmuteAll because they don't act on channels that are already muted.</p> <p>SetMasterMuteOn is muting all the unmuted channels. SetMasterMuteOff is unmuting only the channels that were muted by SetMasterMuteOn.</p> <p>The current state of Master Mute is exposed by the MasterMute digital output signal and remains HIGH until pushing SetMasterMuteOff or at least one output channel is unmuted.</p>
MuteAll UnmuteAll	D	<p>MuteAll and UnmuteAll react to rising edges.</p> <p>Setting MuteAll HIGH mutes all output channels. Setting UnmuteAll HIGH unmutes all output channels.</p>
SetMute_Output01 SetMute_Output02 ... SetMute_Output16	D	<p>SetMute_Output[XX] react to rising and falling edges.</p> <p>Setting SetMute_Output[XX] HIGH mutes the output channel n°XX. Setting SetMute_Output[XX] LOW unmutes the output channel n°XX.</p>

<p>SetGain_Output01# SetGain_Output02# ... SetGain_Output16#</p>	<p>A</p>	<p>SetGain_Output[XX]# control the gain value of the associated output channels.</p> <p>The full analog signal range (0d ~ 65535d) is used to represent the full gain range (-60.0 ~ +15.0dB) of the output channels, which means that:</p> <ul style="list-style-type: none"> - SetGain_Output[XX]# = 0d ⇒ gain = -60.0dB (minimum) - SetGain_Output[XX]# = 65535d ⇒ gain = +15.0dB (maximum) - SetGain_Output[XX]# = 52428d ⇒ gain = 0.0dB (unity) <p>The analog signal value is immediately applied to the associated output channel.</p> <p>If multiple output channels pertain to the same enclosure set, then only the gain value of the first channel of the enclosure set is considered and copied to other channels. The values SetGain_Output[XX] for other channels of the enclosure set are ignored.</p>
<p>SetDspInputModes_DtoA#</p>	<p>A</p>	<p>SetDspInputModes_DtoA# sets the input mode for each of the 16 DSP inputs. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Digital to Analog symbol to convert 16 digital signals to SetDspInputModes_DtoA#, bit1 (lsb) for DSP input 1 and bit16 (msb) for DSP input 16.</p> <p>Set a bit value to LOW for AVB input mode. Set a bit value to HIGH for AUX input mode (Analog or AES/EBU).</p>
<p>SetAuxInputChannels_DtoA#</p>	<p>A</p>	<p>SetAuxInputChannels_DtoA# sets the Aux input channel for each of the 16 DSP inputs. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Digital to Analog symbol to convert 16 digital signals to SetAuxInputChannels_DtoA#, bit1 (lsb) for DSP input 1 and bit16 (msb) for DSP input 16.</p> <p>Set a bit value to LOW for AUX Left/A channel. Set a bit value to HIGH for AUX Right/B channel.</p>
<p>EnableAvbFallbacks_DtoA#</p>	<p>A</p>	<p>EnableAvbFallbacks_DtoA# enables or disables AVB fallback to AUX for each of the 16 DSP inputs. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Digital to Analog symbol to convert 16 digital signals to EnableAvbFallbacks_DtoA#, bit1 (lsb) for DSP input 1 and bit16 (msb) for DSP input 16.</p> <p>Set a bit value to LOW for disabling AVB fallback to AUX. Set a bit value to HIGH for enabling AVB fallback to AUX.</p>
<p>ClearAvbFallbacks</p>	<p>D</p>	<p>ClearAvbFallbacks reacts to rising edges.</p> <p>Push this signal when AVB fallback to AUX is enabled and active on at least one DSP input, to switch back from AUX input to AVB input stream.</p> <p>This will have no effect if the AVB listener is still in a failing status, the DSP input would then remain switched to AUX.</p>

<p>SetState_Gpo1 SetState_Gpo2 SetState_Gpo3</p>	<p>SetState_Gpo[X] control the GPO relay's state manually.</p> <p>This signal has an effect only on GPIOs which are configured in GPO mode (and not in GPI mode) and for which the GPO function is set to Manual State.</p> <p>D Refer to the documentation of LA Network Manager for how to configure GPIO with LA7.16i.</p> <p>Set SetState_GPO[X] to LOW for opening the GPO relay. Set SetState_GPO[X] to HIGH for closing the GPO relay.</p>
<p>BypassPavaSpeakerMonitoring</p>	<p>BypassPavaSpeakerMonitoring is used to temporarily disable the PA/VA Speaker Monitoring generator, in order to prevent disturbing the Load Checker (LA Network Manager) or Enclosure Check processes.</p> <p>D When this signal is HIGH, the PA/VA Speaker Monitoring option is turned down. When this signal is LOW, the PA/VA Speaker Monitoring option is restored to its original state.</p>

FEEDBACK		
Connected	D	This signal is HIGH when the TCP/IP connection to the amplified controller is established, and the remote device is compatible with the module.
UnitType\$	S	This signal represents the amplified controller type connected by the module.
FirmwareVersion\$	S	This signal represents the amplified controller's current version of firmware. Example: '2.12.1.1'
Error	D	This signal is HIGH when at least one error is currently detected or happening with the device. The detail of the errors is printed to the ErrorMessage\$ serial output signal.
ErrorMessage\$	S	ErrorMessage\$ gives textual information on the current errors occurring with the device or the module.
Power	D	HIGH = the amplified controller is Online (operating). LOW = the amplified controller is in Standby mode (sleeping).
DisplayLocked	D	HIGH = the front panel display and buttons are locked. LOW = the front panel display and buttons are unlocked. <i>(Not applicable to LA7.16i which does not have a front panel)</i>
SelectedLayoutOrConfigName\$	S	Represents the type, number and name of the currently selected User Layout or Configuration. The string is empty if no User Layout or no Configuration is selected. String format: [TYPE : number] Name Examples: [USER : 1] Layout 01 [CONFIG : 3] Config 03
SelectedConfigNumber#	A	Represents the currently selected configuration slot number. Possible values: from 1d to 8d. Value when no configuration is selected: 0d
CurrentLayoutName\$	S	Represents the type, number and name of the layout or configuration currently loaded and in action inside the amplified controller. String format: [TYPE : number] Name Examples: [USER : 1] Layout 01 [FACTORY : 1] K2 70 [CONFIG : 3] Config 03
LANM_Connected	D	LOW = LA Network Manager is not connected to the device HIGH = LA Network Manager is connected to the device Layouts and Configurations cannot be loaded from the Crestron module while LA Network Manager is connected to the device.

<p>MasterMute</p>	<p>Represent the current state of the Master Mute.</p> <p>D HIGH = Master Mute is ON and all outputs are muted. LOW = Master Mute is OFF.</p>
<p>Output01_CurrentMute Output02_CurrentMute ... Output16_CurrentMute</p>	<p>Output[XX]_CurrentMute represents the current mute state of output channel XX.</p> <p>D HIGH = output channel XX is muted. LOW = output channel XX is unmuted.</p>
<p>Output01_CurrentGain# Output02_CurrentGain# ... Output16_CurrentGain#</p>	<p>These analog signals represent the current gain value of the output channels. The full analog signal range (0d ~ 65535d) is used to represent the full gain range (-60.0 ~ +15.0dB) of the output channels, which means that:</p> <p>A</p> <ul style="list-style-type: none"> - Output[XX]_CurrentGain# = 0d ⇒ gain = -60.0dB (minimum) - Output[XX]_CurrentGain# = 65535d ⇒ gain = +15.0dB (maximum) - Output[XX]_CurrentGain# = 52428d ⇒ gain = 0.0dB (unity)
<p>Output01_CurrentName\$ Output02_CurrentName\$... Output16_CurrentName\$</p>	<p>These signals represent the enclosure family and type of speaker section connected to each output channel, according to the currently loaded layout or configuration.</p> <p>S Examples: KIVA II – PA K2 – MF X15 – HF KS21 – SB</p>
<p>CurrentDspInputModes_AtoD#</p>	<p>CurrentDspInputModes_AtoD# represents the input mode of each of the 16 DSP inputs. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>A Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for DSP input 1 and bit16 (msb) for DSP input 16.</p> <p>LOW = input mode is AVB HIGH = input mode is AUX (Analog or AES/EBU).</p>
<p>CurrentAuxInputChannels_AtoD#</p>	<p>CurrentAuxInputChannels_AtoD# represents the Aux input channel selection of each of the 16 DSP inputs. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>A Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for DSP input 1 and bit16 (msb) for DSP input 16.</p> <p>LOW = selected channel is AUX Left/A. HIGH = selected channel is AUX Right/B.</p>

AvbFallbacksEnabled_AtoD#	A	<p>AvbFallbacksEnabled_AtoD# represents the AVB fallback to AUX enablement/disablement of each of the 16 DSP inputs. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for DSP input 1 and bit16 (msb) for DSP input 16.</p> <p>LOW = AVB fallback to AUX is disabled. HIGH = AVB fallback to AUX is enabled.</p>
AvbFallbacksActive_AtoD#	A	<p>AvbFallbacksActive_AtoD# represents the AVB fallback to AUX active state of each of the 16 DSP inputs. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for DSP input 1 and bit16 (msb) for DSP input 16.</p> <p>LOW = AVB fallback to AUX is inactive, AVB source is used. HIGH = AVB fallback to AUX is active, fallback AUX source is used.</p>
AvbStreamsLocked_AtoD#	A	<p>AvbStreamsLocked_AtoD# represents the locked state of each of the 16 AVB input streams of the amplified controller. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for AVB input stream 1 and bit16 (msb) for AVB input stream 16.</p> <p>LOW = AVB input streams is not locked. HIGH = AVB input stream is locked.</p>
AesLocked	D	<p>HIGH = AES/EBU input is locked LOW = AES/EBU input is not locked, or AUX input mode is set to Analog.</p>
InputAudioSignals_AtoD#	A	<p>InputAudioSignals_AtoD# tells which DSP inputs are currently receiving audio modulation. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for DSP input 1 and bit16 (msb) for DSP input 16.</p> <p>HIGH = the DSP input digital level is > -60.0dBFS. LOW = the DSP input digital level is ≤ -60.0dBFS.</p>
OutputAudioSignals_AtoD#	A	<p>OutputAudioSignals_AtoD# tells which output channels are currently producing audio modulation. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for output channel 1 and bit16 (msb) for output channel 16.</p> <p>HIGH = the output channel digital level is > -60.0dBFS. LOW = the output channel digital level is ≤ -60.0dBFS.</p>

<p>OutputLimiting_AtoD#</p>	<p>A</p> <p>OutputAudioSignals_AtoD# tells the current state of the L-Drive limiter on each output channel. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for output channel 1 and bit16 (msb) for output channel 16.</p> <p>HIGH = L-Drive is currently limiting with more than 3dB of gain reduction on the output channel. LOW = L-Drive is not engaged on the output channel (or with less than 3dB of gain reduction).</p>
<p>OutputClipping_AtoD#</p>	<p>A</p> <p>OutputClipping_AtoD# tells which output channels are currently clipping. It is a 16bit field represented by an analog value (0 ~ 65535).</p> <p>Use the Analog To Digital symbol to convert this signal to 16 digital signals, bit1 (lsb) for output channel 1 and bit16 (msb) for output channel 16.</p> <p>HIGH = the output digital level is reaching 0dBFS. Audio is clipping on the channel. LOW = the output digital level is below 0dBFS.</p>
<p>Gpio1_CurrentState Gpio2_CurrentState Gpio3_CurrentState</p>	<p>D</p> <p>Gpio[X]_CurrentState represent the current GPI digital input or GPO relay output state.</p> <p>The behavior depends on the GPIO direction setting (GPI or GPO):</p> <p><u>GPI mode</u> HIGH = the digital input state is HIGH. LOW = the digital input state is LOW. <u>GPO mode</u> HIGH = the output relay is closed. LOW = the output relay is open.</p>
<p>Backup24V</p>	<p>D</p> <p>The 24VDC input pins of the amplified controller permits the DSP card to stay alive during a mains power outage, maintaining network connectivity and reducing the booting time when mains power returns.</p> <p>HIGH = a valid 24V backup power supply is detected. LOW = no valid 24V backup power supply is detected.</p>
<p>PavaEnabled</p>	<p>D</p> <p>This signal indicates if Public Address/Voice Alarm features are enabled on the amplified controller.</p> <p>HIGH = PAVA features are enabled LOW = PAVA features are disabled</p> <p>PAVA settings are established by an L-Acoustics engineer and stored on the Crestron processor's internal hard drive.</p>
<p>PavaError</p>	<p>D</p> <p>HIGH = at least one PAVA error is detected. The details of these errors are written to the PavaErrorMessage\$ serial output signal. LOW = no PAVA error is occurring.</p>
<p>PavaErrorMessage\$</p>	<p>S</p> <p>PavaErrorMessage\$ gives textual information on the current PAVA errors occurring on the connected amplified controller.</p>

PARAMETERS

IpAddress	S	<p>IP address of the Amplified Controller, for example "192.168.1.100".</p> <p>The IP address must be in the following ranges:</p> <ul style="list-style-type: none">- 10.0.0.1 – 10.255.255.254 (Class A)- 172.16.0.1 – 172.31.255.254 (Class B)- 192.168.0.1 – 192.168.255.254 (Class C)- 100.64.0.1 – 100.127.255.254 (SAS)- 169.254.0.1 – 169.254.255.254 (APIPA)
EnableAudioSignals	A	<p>This parameter is used to enable audio levels monitoring.</p> <ul style="list-style-type: none">- 0d = audio levels monitoring is disabled. InputAudioSignals_AtoD# and OutputAudioSignals_AtoD# are set to 0d.- 1d = audio levels monitoring is enabled. InputAudioSignals_AtoD# and OutputAudioSignals_AtoD# can be different from 0d if associated audio levels exceed –60.0dBFS. <p>Important note</p> <p>Enabling audio levels can be CPU-consuming for the CRESTRON processor, especially when multiple modules are inserted in the programs.</p> <p>They are disabled by default, and we recommend that they remain disabled unless this feature is absolutely necessary, or when the number of modules is less than 10.</p> <p>Alternatively, audio levels can be enabled only on a limited selection of modules, for example one amplified controller per line source.</p> <p>Please test your program first with audio levels disabled, and if CPU has good headroom when running the full programs, then try to enable signals and send normal audio to all unmuted amplified controllers to check that CPU load is not going over 90%.</p>

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TESTING	
OPS USED FOR TESTING:	RMC3 v1.8001.4788.22932
SIMPL WINDOWS USED FOR TESTING:	4.1900.00
CRESTRON DB USED FOR TESTING:	211.0000.002.00
DEVICE DB USED FOR TESTING:	200.16000.001.00
SAMPLE PROGRAM:	Demo Program (16ch Amp)