Wattstopper®

LMDI-100 Interface Host Commands

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BAA and TAA compliant (Product produced in the U.S.)

The LMDI-100 Serial Data Input/Output Device allows seamless integration of 3rd party devices to the Wattstopper Digital Lighting Management Local Network (DLM) via RS-232 signaling and the Wattstopper defined protocol.

This document contains commands to be used for communicating with the LMDI-100. Refer to the LMDI-100 Installation Instructions for connecting to DLM and proper wiring to 3rd party devices before proceeding.

PHYSICAL LAYER PARAMETERS (SERIAL COMMUNICATION PORT SETTINGS)

In order to communicate with the LMDI-100 interface in client mode (where it is to be connected to a Third Party Host controller), use the following Communication Port setting:

19200 bps, 8 data bits, No parity, 1 Stop bit.

RULES OF ENGAGEMENT

- The LMDI-100 communicates in a similar way as HyperTerminal and other RS-232 serial consoles.
- The LMDI-100 interface does not issue a Prompt.
- Commands sent to the LMDI-100 interface are NOT case sensitive, so for instance “Help” is the same as “HELP”. However, for readability and ease of troubleshooting it is recommended to use UPPERCASE.
- Commands sent to the LMDI-100 interface must end in a [CR], [LF] or [NULL].
- [CR] is a carriage return (ASCII 0D hex, 13 decimal), [LF] is a line feed (ASCII 0A hex or 10 decimal), [NULL] is an (ASCII 0).
- The LMDI-100 interface will accept a command that ends with a [CR], [LF], [CR][LF], or a [NULL]. This may not be changed or configured.
- The LMDI-100 interface will send back a response that ends in a [CR][LF] unless the DELIMITER is changed. Note that changing the delimiter is required every time power is cycled to the unit as this parameter is kept in volatile memory in order to avoid issues should the unit be installed in a different application.
- On Power Up, the LMDI-100 interface will send a S:ONLINE[CR][LF] indicating that the Host command session is now active.
- Type “HELP” at any time will print a summary of the available commands.
- All responses to queries/commands begin with”R:”
- All status updates start with “S:”

NOTE: For more information on DLM room functionality such as Load ID assignments and scene creation, see the DLM System Guide and DLM Dimming Addendum.

ECHO <text>		
Purpose	Troubleshooting tool. The LMDI-100 interface will simply send back to the Host whatever text it receives.	
Parameters	**<text>**	Most printable text (no special characters allowed)
Example	**Command**	ECHO are you there [CR]
	Response	R: ECHO are you there [CR]

VERSION		
Purpose	Get the Version of the LMDI-100 Interface Firmware	
Parameters	**[None]**	
Example	**Command**	VERSION [CR]
	Response	R: VERSION 2.3[CR]

DELIMITER <hex char> [<hex char>]		
Purpose	Set the end of message delimiter that the LMDI-100 interface sends to the Host.	
Parameters	**[None]**	
Example	**Command**	DELIMITER OD[CR]
	Response	R:DELIMITER OD[CR]

LOAD <load_id> <level>		
Purpose	Set a load or a set of loads to a specific level. Note that the Response coming from the LMDI-100 is only an acknowledgement of the request, in order to get the actual current level of a load, use the GETLOAD command.	
Parameters	**<Load_id>** **<level>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below). A value in the 0 to 100 range. Note that if using a decimal number, then the decimal portion will be truncated.
Example 1	**Command**	LOAD 4 100[CR]
	Response	R:LOAD 4 100[CR]
Example 2	**Command**	LOAD 1 25[CR]
	Response	R:LOAD 1 25[CR]
Example 3	**Command**	LOAD 1&3&8 55[CR]
	Response	R:LOAD 1&3&8 55[CR]

FADELOAD <load_id> <level> <fade_time> (equivalent to RAMPLOAD)		
RAMPLOAD <load_id> <level> <fade_time>		
Purpose	Set a load or a set of loads to a specific level using a specific time it should take for the loads to get to that level. This time will be the same regardless of where the load(s) started from. Note that the Response coming from the LMDI-100 is only an acknowledgement of the request, in order to get the actual current level of a load use the GETLOAD command.	
Parameters	**<Load_id>** **<level>** **<fade_time>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below). A value in the 0 to 100 range. Note that if using a decimal number, then the decimal portion will be truncated. Time, in seconds, the affected load(s) should take to get to the desired level. Note that in DLM the resolution that can be used for this parameter varies across the range. In DLM this time delay can be as high as 18 hours, however, there is “seconds” resolution from 1 to 60 seconds, above that there is “minutes” resolution from 1 to 180 minutes (up to 3 hours) and above that there is “hours” resolution from 3 to 18 hours.
Example 1	**Command**	RAMPLOAD 4 100 300[CR]
	Response	R:RAMPLOAD 4 100 300[CR]
Example 2	**Command**	RAMPLOAD 1 25 30[CR]
	Response	R:RAMPLOAD 1 25 30[CR]
Example 3	**Command**	RAMPLOAD 1&3&8 55 10000[CR]
	Response	R:RAMPLOAD 1&3&8 55 10000[CR]
Example 4 (equivalent to Example 1)	**Command**	FADELOAD 4 100 300[CR]
	Response	R:FADELOAD 4 100 300[CR]
Example 5 (equivalent to Example 2)	**Command**	FADELOAD 1 25 30[CR]
	Response	R:FADELOAD 1 25 30[CR]
Example 6 (equivalent to Example 3)	**Command**	FADELOAD 1&3&8 55 10000[CR]
	Response	R:FADELOAD 1&3&8 55 10000[CR]

RAMPUP <load_id> <fade_rate>		
Purpose	Raise the level of a load or a set of loads at a specific rate. Note that in this case the target level is not pre-determined as it gets determined by when the Ramp is stopped (see RAMPSTOP command later in this document). Issuing a RAMPSTOP command to the same load(s) is required to stop the Ramp.	
Parameters	**<Load_id>** **<fade_rate>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below). This parameter determines how fast the level of the load(s) should be changed in percentage (of the full range) per second. This valid range is from 1% to 100% per second, no decimal values are allowed.
Example 1	**Command**	RAMPUP 4 5[CR]
	Response	R:RAMPUP 4 5[CR]
Example 2	**Command**	RAMPUP 1 30[CR]
	Response	R:RAMPUP 1 30[CR]
Example 3	**Command**	RAMPUP 1&3&8 10[CR]
	Response	R:RAMPUP 1&3&8 10[CR]

RAMPDOWN <load_id> <fade_rate>		
Purpose	Lower the level of a load or a set of loads at a specific rate. Note that in this case the target level is not pre-determined as it gets determined by when the Ramp is stopped (see RAMPSTOP command later in this document). Issuing a RAMPSTOP command to the same load(s) is required to stop the Ramp.	
Parameters	**<Load_id>** **<fade_rate>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below). This parameter determines how fast the level of the load(s) should be changed in percentage (of the full range) per second. The valid range is from 1% to 100% per second, no decimal values are allowed.
Example 1	**Command**	RAMPDOWN 4 5[CR]
	Response	R:RAMPDOWN 4 5[CR]
Example 2	**Command**	RAMPDOWN 1 30[CR]
	Response	R:RAMPDOWN 1 30[CR]
Example 3	**Command**	RAMPDOWN 1&3&8 10[CR]
	Response	R:RAMPDOWN 1&3&8 10[CR]

RAMPSTOP <load_id>		
Purpose	Stops an ongoing ramp (UP or DOWN) previously initiated on a load or a set of loads.	
Parameters	**<Load_id>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below).
Example 1	**Command**	RAMPSTOP 4[CR]
	Response	R:RAMPSTOP 4[CR]
Example 2	**Command**	RAMPSTOP 1[CR]
	Response	R:RAMPSTOP 1[CR]
Example 3	**Command**	RAMPSTOP 1&3&8[CR]
	Response	R:RAMPSTOP 1&3&8[CR]

MASTERRAMPUP <load_id> <fade_rate>		
Purpose	Raise the level of all loads at a specific rate. Note that in this case the target level is not pre-determined as it gets determined by when the Ramp is stopped (see MASTERRAMPSTOP command later in this document).	
Parameters	**<fade_rate>**	This parameter determines how fast the level of the load(s) should be changed in percentage (of the full range) per second. The valid range is from 1% to 100% per second, no decimal values are allowed.
Example 1	**Command**	MASTERRAMPUP 5[CR]
	Response	R:MASTERRAMPUP 5[CR]
Example 2	**Command**	MASTERRAMPUP 30[CR]
	Response	R:MASTERRAMPUP 30[CR]

MASTERRAMPDOWN <fade_rate>		
Purpose	Lower the level of all loads at a specific rate.	
Parameters	**<fade_rate>**	This parameter determines how fast the level of the load(s) should be changed in percentage (of the full range) per second. The valid range is from 1% to 100% per second, no decimal values are allowed.
Example 1	**Command**	MASTERRAMPDOWN 5[CR]
	Response	R:MASTERRAMPDOWN 5[CR]
Example 2	**Command**	MASTERRAMPDOWN 30[CR]
	Response	R:MASTERRAMPDOWN 30[CR]

MASTERRAMPSTOP		
Purpose	Stops an ongoing MASTER ramp (UP or DOWN) previously initiated.	
Example	**Command**	MASTERRAMPSTOP [CR]
	Response	R:MASTERRAMPSTOP [CR]

GETLOAD <load_id>		
Purpose	**Gets the level of a load or a set of loads**	
Parameters	**<Load_id>**	**Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the "&" character to separate them (see examples below).** Note that individual responses will be received in the case of multiple loads being requested (one response per load). Also note that if there is a problem with the load preventing its current level from being acquired then the LMDI-100 will report its level as 255. Normal levels returned are in the 0 to 100 range with no decimals.
Example 1	**Command**	**GETLOAD 4[CR]**
	Response	**R:GETLOAD 4 100[CR]**
Example 2	**Command**	**GETLOAD 1 [CR]**
	Response	**R:GETLOAD 1 45[CR]**
Example 3	**Command**	**GETLOAD 1&3&8[CR]**
	Responses	**R:GETLOAD 1 50[CR]** R:GETLOAD 3 100[CR] R:GETLOAD 8 20[CR]

SCENE <scene_id>		
Purpose	Recalls a scene that has been preprogrammed in DLM.	
Parameters	**<scene_id>**	Recall scene 1 to 16. Note that DLM supports the notion of partitioned spaces via the use of Profiles, there are 16 possible scenes per profile.
Example 1	**Command**	SCENE 4[CR]
	Response	R:SCENE 4[CR]
Example 2	**Command**	SCENE 16[CR]
	Response	R:SCENE 16[CR]

SETSCENE <scene_id>		
Purpose	Instructs loads that honor the corresponding scene to save their current level as the level they should go to when the scene is recalled.	
Parameters	**<scene_id>**	Scene being saved, in the 1 to 16 range. Note that DLM supports the notion of partitioned spaces via the use of Profiles; there are 16 possible scenes per profile. The Loads will save the corresponding scene in the currently active Profile.
Example 1	**Command**	SETSCENE 4[CR]
	Response	R:SETSCENE 4[CR]
Example 2	**Command**	SETSCENE 16[CR]
	Response	R:SETSCENE 16[CR]

LOCKBUTTONS <time_delay>		
Purpose	Locks switch buttons on those switches that have been programmed to honor this command. Note that this command works in conjunction with the UNLOCKBUTTONS command (documented later in this document).	
Parameters	**<time_delay>**	Value in minutes in the 0 to 240 minutes range. The Host Controller needs to keep sending the LOCK message every so often (at least two times within the <time delay> period) in order to refresh the locking mechanism. This provides for a fail-safe mechanism in case the Host Controller stops functioning, then the switches will unlock themselves after the <time delay> period has expired. Note that a value of 0 means that the fail-safe mechanism has been disabled and so the only way to unlock the switches is by sending the UNLOCKBUTTONS command. This is not recommended but is made available in case the host controller has limitations in terms of sending the repeated LOCKBUTTONS command at regular intervals.
Example	**Command**	LOCKBUTTONS 10[CR]
	Response	R:LOCKBUTTONS 10[CR]

UNLOCKBUTTONS		
Purpose	Unlocks switch buttons so that their buttons start working normally. Note that this command works in conjunction with the LOCKBUTTONS command.	
Parameters	**[none]**	
Example	**Command**	**UNLOCKBUTTONS[CR]**
	Response	**R:UNLOCKBUTTONS[CR]**

CHANGEPROFILE <profile_id>		
Purpose	Allows the Third Party COntroller to change the currently active profile in the space. Used for spaces that support partitions (moveable walls) and that have been configured as such.	
Parameters	**<profile_id>**	Value in the 1 to 16 range. This is the profile that will be made active.
Example	**Command**	CHANGEPROFILE 5[CR]
	Response	R:CHANGEPROFILE 5[CR]

AFTERHOURS		
Purpose	Allows the Third Party Controller to change the current mode of operation in the room to After Hours. Note that at some point the Third Party Controller should issue the NORMALHOURS command to return the room to the normal operating mode.	
Example	**Command**	AFTERHOURS [CR]
	Response	R:AFTERHOURS [CR]

NORMALHOURS		
Purpose	Allows the Third Party Controller to change the current mode of operation in the room to Normal Hours. See the related AFTERHOURS command.	
Example	**Command**	NORMALHOURS [CR]
	Response	R:NORMALHOURS [CR]

FORCEON <load_id> <level>		
Purpose	Allows the Third Party Controller to force the load(s) ON to a certain level using a higher priority level than local control devices. At some point the FORCEONCANCEL command should be used on the same load(s) to return them to their normal operating condition.	
Parameters	**<Load_id>** **<level>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below). A value in the 1 to 100 range. Note that if using a decimal number, then the decimal portion will be truncated.
Example 1	**Command**	FORCEON 4 100[CR]
	Response	R:FORCEON 4 100[CR]
Example 2	**Command**	FORCEON 1 25[CR]
	Response	R:FORCEON 1 25[CR]
Example 3	**Command**	FORCEON 1&3&8 55[CR]
	Response	R:FORCEON 1&3&8 55[CR]

FORCEONCANCEL <load_id>		
Purpose	Used to cancel a previously initiated FORCEON action. See FORCEON command for details.	
Parameters	**<Load_id>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below).
Example 1	**Command**	FORCEONCANCEL 4[CR]
	Response	R:FORCEONCANCEL 4[CR]
Example 2	**Command**	FORCEONCANCEL 1[CR]
	Response	R:FORCEONCANCEL 1[CR]
Example 3	**Command**	FORCEONCANCEL 1&3&8[CR]
	Response	R:FORCEONCANCEL 1&3&8[CR]

CLEAN <load_id> <level>		
Purpose	Allows the Third Party Controller to set the level of the load(s) using a lower than normal priority level in order to allow for cleaning crews to work on the space, and when leaving it the lights will remain as they were before they came in.	
Parameters	**<Load_id>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below).
	<level>	A value in the 1 to 100 range. Note that if using a decimal number, then the decimal portion will be truncated.
Example 1	**Command**	CLEAN 4 100[CR]
	Response	R:CLEAN 4 100[CR]
Example 2	**Command**	CLEAN 1 25{CR]
	Response	R:CLEAN 1 25[CR]
Example 3	**Command**	CLEAN 1&3&8 55[CR]
	Response	R:CLEAN 1&3&8 55[CR]

CLEANCANCEL <load_id>		
Purpose	Used to cancel a previously initiated CLEAN action. See CLEAN command for details	
Parameters	**<Load_id>**	Set of load identifiers each in the 1 to 64 range. For multiple identifiers use the “&” character to separate them (see examples below).
Example 1	**Command**	CLEANCANCEL 4[CR]
	Response	R:CLEANCANCEL 4[CR]
Example 2	**Command**	CLEANCANCEL 1[CR]
	Response	R:CLEANCANCEL 1[CR]
Example 3	**Command**	CLEANCANCEL 1&3&8[CR]
	Response	R:CLEANCANCEL 1&3&8[CR]

STATUS <type (LOAD/SCENE/PROFILE/BUTTON/BUTTONLOCK/OCCUPANCY/ALL/NONE)>		
Purpose	Request status reporting. The idea here is to avoid the need for the Third Party Controller to have to constantly poll the LMDI-100 interface in order to find out the status of certain elements in the system, more commonly Load Level changes. Once subscribed for a specific type of event, the LMDI-100 interface will send status messages to the Third Party Controller as changes occur in the system, these types of unsolicited Status messages are distinct in that they start with the “S:” suffix.	
Parameters	**<type>**	Here the Third Party Controller tells the LMDI-100 interface what type of status it is subscribing for. The valid values are LOAD, SCENE, PROFILE, BUTTON, BUTTONLOCK, OCCUPANCY, ALL, DAYLIGHTING and NONE. If there is a need to subscribe for multiple types of notifications then the STATUS command should be issued separately for each of those types. Using NONE effectively clears up any prior subscription so no more unsolicited status messages will be received.
Example	**Command**	STATUS LOAD[CR]
	Responses	R:STATUS LOAD[CR]
	Event driven Status messages	S:LOAD <load_id> <level>[CR]
Example of other event driven Status messages		S:SCENE <scene_id> S:PROFILE <profile_id> S:BUTTON <source_address> <btn_id> <action (PRESS/HELDUP/HELDDOWN/RELEASED)> S:BUTTONLOCK <(ACTIVE/INACTIVE)> S:OCCUPANCY <(OCCUPIED/VACANT)> S:DAYLIGHTING

ONLINE		
Purpose	Status feedback from the LMDI-100 to the Host when it boots (power cycle events). This is not status the Host needs to register for, it occurs independently.	
Parameters	**[none]**	
Example	**Unsolicited status message**	S:ONLINE[CR]

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