Panasonic

Laser Marker

Serial Communication Command Guide

(Expanded Command Edition) LP-M/S/Z compatible mode

LP-ZV series

This manual describes the commands that can be used when the optional expansion board LP-AEB10 has been installed. Please read the Serial Communication Command Guide (ME-LPZV-SR-MSZ) together with this manual.

ME-LPZV-SREX-MSZ-2

2024.4 | industry.panasonic.com/

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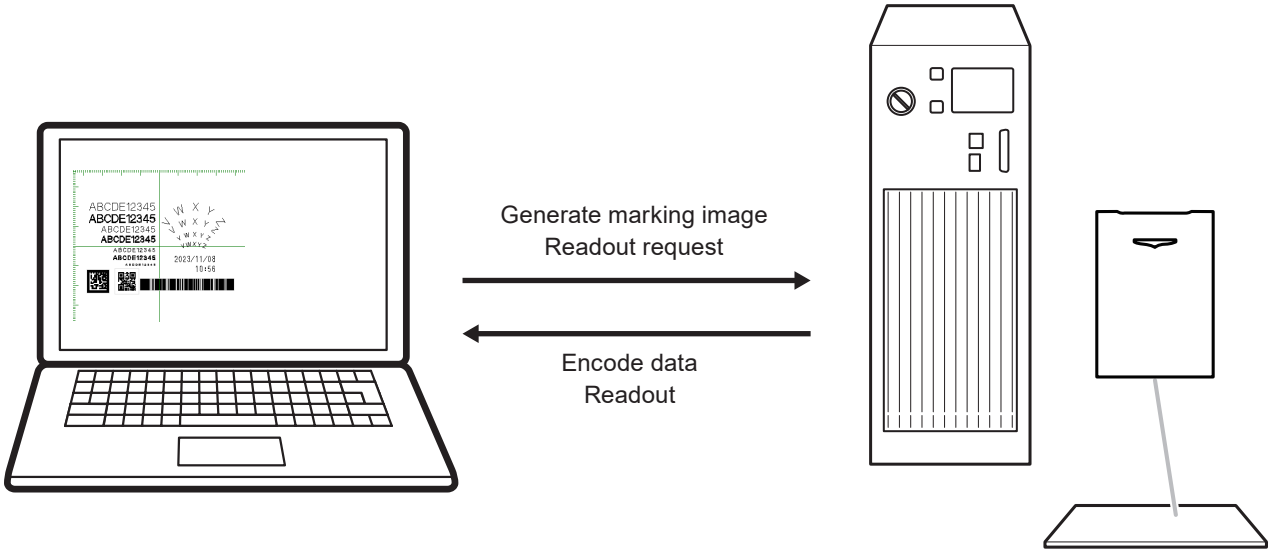
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1 Overview

1-1 IMG/IMC command overview

This function enables the software and external device developed by the user to display the marking image generated in the laser marker.



- Transmission of the IMC command generates an image file (PNG format) of the marking image in the laser marker.
- The image size and PPI in the image data to be generated can be set using the command.
- The generated image file is converted to a Base64-encoded string data.
- Transmission of the IMG command reads out the string data in blocks.
- On the external device side, the received string data is concatenated and decoded using Base64 decoding to provide a PNG image.

Reference

- Base64 features specifications that comply with RFC 4648.
- Maximum block size is 3072-bytes.

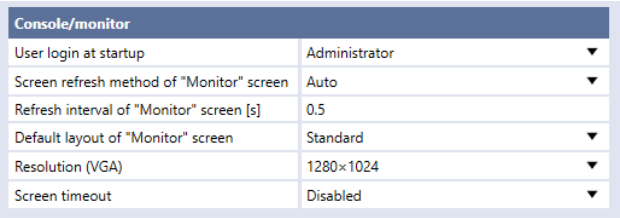
1-2 Restrictions

■ System configuration

The optional function expansion board (LP-AEB10) is required to use this command.

■ Configurations

- This command can be used only in remote mode.
- The console must be in a log-in state to use this command.
  - To automatically log in at a startup of the laser marker, set [User login at startup] in the system setting [Console / monitor] to [Restricted user] or [Administrator].



  - This command cannot be used while Laser Marker NAVI smart (or LmUtil) is connected to the laser marker because the console is in a log-off state during that period.

■ Command execute condition

- Transmission of command reception permission (reception permission ON setting in MKM command) is not necessary for this command even when there is a setting request (when the sub command is “S”).
- This command is accepted even when an alarm or warning occurs.

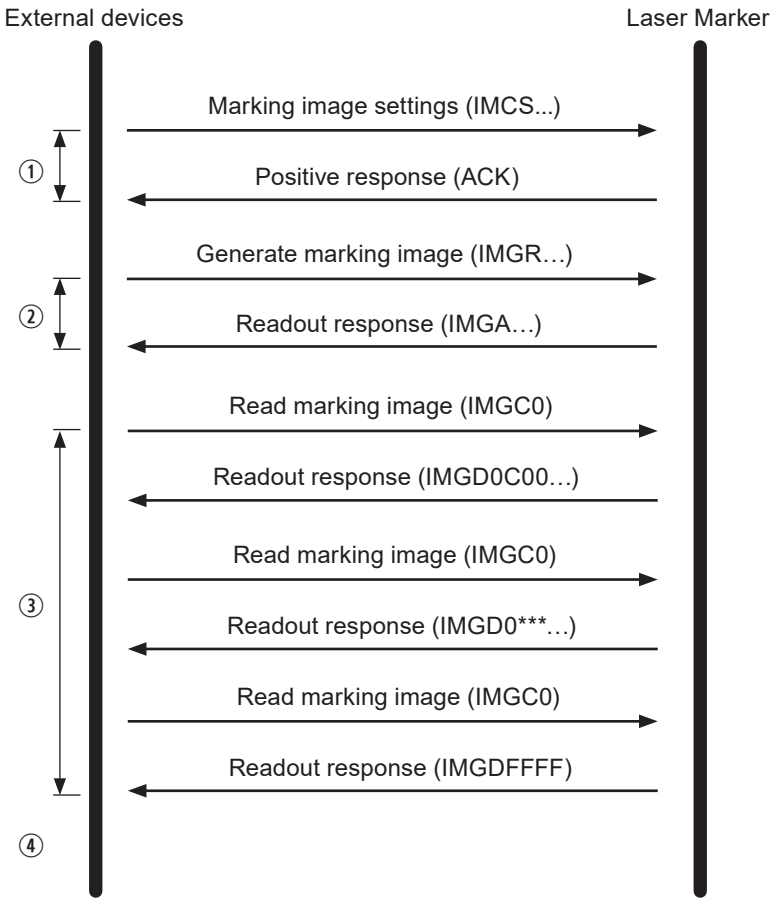
■ Marking image

3D marking image cannot be acquired.

1-3 Example of communication sequence and control

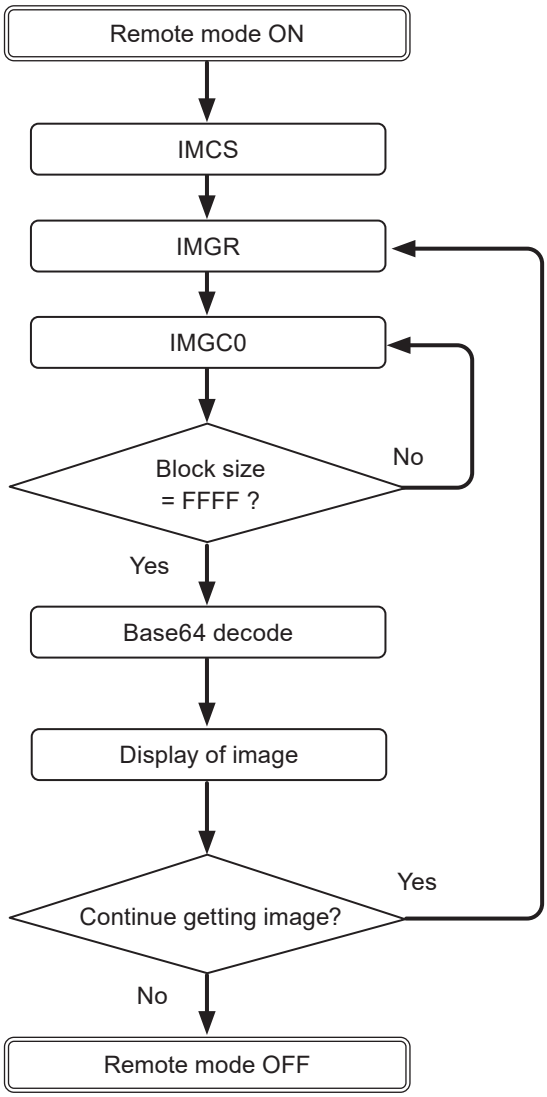
IMG/IMC command provides control according to the following sequence.

■ Communication sequence



No.	Steps	Description
①	Marking image settings	Transmits the IMCS command and specifies the image width, height and PPI in the image file.
②	Generate marking image	Transmission of the IMGR command generates a marking image (png format) in the laser marker. Reads out the file size.
③	Read marking image	Replies the Base64-encoded data in blocks when the IMGC command is transmitted. Reads out repeatedly until “IMGDFFFF” is replied.
④	Display of marking image by external device	Displays the image as a PNG image when the received Base64-encoded data is concatenated by the external device.

■ Example of control



2 Data Format for Each Command

2-1 Command List

Type	Name	Code	Functions	Refer
For embedment in system	Marking image settings	IMC	Sets the width, height, and PPI of the marking image to be generated using the IMGR command.	(P.10)
	Generate marking image	IMGR	Generates the marking image.	(P.12)
	Read marking image	IMGC	Reads out the marking image data generated using the IMGR0 command.	(P.14)

2-2 Command for embedment in system

2-2-1 Marking image settings: IMC

Sets the specifications for the marking image to be read out using the IMGC command.

Reference

- Applies the setting entered by this command to all files.
- Saves the setting entered by this command in the laser marker even if the file is not overwritten.
- Transmission of command reception permission (reception permission ON setting in MKM command) is not necessary for this command even when there is a setting request (when the sub command is “S”).
- This command is accepted even when an alarm or warning occurs.

■ Setting request data / response data at the time of readout

Start code	IMC	Sub command	[Width][Height][PPI] 13-byte	(Check sum)	End code

Sub command is “S” for the setting request data and “A” for the response data for readout.

■ Readout request data

Start code	IMC	R	(Check sum)	End code

■ Data description

Name	Data length [byte]	Data content	Remarks
Width	4	“0064”–“1024” [px]	• Specifies the width and height of the image to be generated. The larger the size is, the longer it takes to generate/read out the image. • Default setting is “0280”.
Height	4		
PPI	5	“010.0”–“999.9” [px/inch]	• When this item is specified according to the resolution of the image display monitor, the displayed image becomes close to the actual size. • Default setting is “096.0”.
Total data length	13	The data length is fixed.	

■ Data format of positive response

Start code [ACK]	Response code “00”	(Check sum)	End code

■ Example of command settings

Condition: Width = 640, Height = 480, PPI = 120

• Setting

Transmission data	[STX]	IMC	S	06400480120.0	[CR]

Receiving data	[STX]	00	Check sum	[CR]

• Readout

Transmission data	[STX]	IMC	R	[CR]

Response data	[STX]	IMC	A	06400480120.0	[CR]

Reference

• Detailes of data format of negative response, refer to “2-3 Data format of negative response” (P.16).

2-2-2 Generate marking image: IMGR

Generates the marking image.

Reference

- The width, height, and resolution of the PNG image to be generated are set using the IMC command.
- The generated image data is read out by the IMGC command.
- The generated image is cleared when it is read out and the state returns to an “image not generated” condition.
- When the remote mode is set to OFF, the generated image is cleared and the state returns to an “image not generated” condition.
- This command is accepted even when an alarm or warning occurs.

■ Readout request data

Start code	IMG	R	[X-position][Y-position][Scaling] 21-byte	(Check sum)	End code

■ Data description: Readout request data

Name	Data length [byte]	Data content	Remarks
X-position	8	Model: LP-ZV200P, LP-ZV500P — Setting range [mm]: “062.500” – “+062.500” Model: LP-ZV205P, LP-ZV505P — Setting range [mm]: “-110.000” – “+110.000” Model: LP-ZV206P, LP-ZV506P — Setting range [mm]: “-165.000” – “+165.000”	When the image display position is specified in the marking area, the marking image is generated with the specified coordinates at the center.
Y-position	8		
Scaling	5	“00015”–“10000” [%]	
Total data length	21	The data length is fixed.	

■ Response data for readout

Start code	IMG	A	[File size] 8-byte	(Check sum)	End code

■ Data description

Name	Data length [byte]	Data content	Remarks
File size	8	“00000000” – “00100000” (HEX) [byte]	The file size of the PNG image (before Base64 encoding) is returned in hexadecimal format.
Total data length	8	The data length is fixed.	

■ Example of command settings

Condition: Generate marking image (X-position=-20, Y-position=30, Scaling=200)

• Readout

Transmission data	[STX]	IMG	R	-020.000+030.00000200	[CR]

Response data	[STX]	IMG	A	00000FBE	[CR]

Reference

• Detailes of data format of negative response, refer to “2-3 Data format of negative response” (P.16).

2-2-3 Read marking image: IMGC

The generated image is read out by the IMGR command.

Reference

- The width, height and resolution of the PNG image to be generated are set using the IMC command.
- The image data to be read out is generated using the IMGR command.
- The marking image data cannot be read out if the marking image has not been generated,
- This command is accepted even when an alarm or warning occurs.

■ Block readout request data

Start code	IMG	C	[Function] 1-byte	(Check sum)	End code

■ Data description

Name	Data length [byte]	Data content	Remarks
Function	1	“0” : Readout next block “1” : Reread previous block “2” : Abort readout	• When “0” is specified, the data is read out from the location following the previously read out location (in the case of first readout operation after the Generation of image: from the beginning of the data). • When “1” is specified, the data that was read out previously based on the setting of “0” is read out again. • When “2” is specified, the generated image is discarded and the state returns to an “image not generated” condition.
Total data length	1	The data length is fixed.	

■ Block response data for readout

Start code	IMG	D	[Block size],[Block data] Min. 4-byte, Max. 3076-byte	(Check sum)	End code

■ Data description: Response data for marking image readout

Name	Data length [byte]	Data content	Remarks
Block size	4	“0000” – “0C00” (HEX) [byte] “FFFF” : Data transfer completed	Indicates the length of the block data after Base64 encoding. “FFFF” indicates that the last block has been transferred. When “FFFF” is read out, the image in the laser marker is cleared and the block cannot be read out anymore.
Block data	Min. 0 Max. 3072	Base64-encoded block data	When the block size is “FFFF”, the block data is 0-byte in size.
Total data length	Min. 4 Max. 3076	The data length varies depending on the length of the block data.	

■ Example of command settings

Condition: Readout next block (Block size=3072)

• Readout

Transmission data	[STX]	IMG	C	0	[CR]

Response data	[STX]	IMG	D	0C00iVBORw0KGg…(Omit)…3c9X1y8ePG	[CR]

Condition: Readout next block (Data transfer completed)

• Readout

Transmission data	[STX]	IMG	C	0	[CR]

Response data	[STX]	IMG	D	FFFF	[CR]

Reference

• Detailes of data format of negative response, refer to “2-3 Data format of negative response” (P.16).

2-3 Data format of negative response

■ Data format of negative response

Start code	Response code “01”–“99”	(Check sum)	End code

Response code	Error cause
“03”	• Marking image cannot be generated because the console is not in a log-in state. (To enable automatic log-in at a startup, set [User login at startup] in the system setting. Note that the console is in a log-out state while NAVI smart is connected.) • An attempt was made to generate a marking image in a condition which disables the Generation of marking image (such as when NAVI smart is on-line connected). (IMG command) • An attempt was made to read out the marking image in a condition in which the marking image has not been generated. (IMG command)
“04”	No applicable command.
“05”	Incorrect check sum.
“06”	Incorrect data length.
“08”	Incorrect sub command.

“09”	• Invalid variable-length or fixed-length data part.
	  • You have specified a value that cannot be combined in that command.
	  • You have specified an invalid character for the character data part.
	  • Unsupported character code other than ASCII code and Shift JIS code is used in the character data part.
	  • Too many number of characters in the character data part.

“14”	The command cannot be used because the optional expansion board is not installed. (IMC command / IMG command)

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April, 2024