LenMark Marking Software Manual

3DS Secondary Development - Network Port Communication

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1、Overview

1. Based on TCP and IP protocols, the data message takes the form of json data packet format string;
2. This interface serves as a tcp server, listening port: 50000;
3. Each function is completed through a Request: and a Return:.

2、Interface Description

2.1 File Operation Class

1、Open File

Function	open file
Parameter	Path; file path
Returned Value	ret 1: Successfully executed 0: Not executed -1: Failed to open -2: File does not exist

Request	{
	“sid”: 0,
	“cmd”: “open_file”,
	“data”: {
	“path”: “./document1.emd”
	}
	}

Return	{
	"sid": 0,
	"cmd": "open_file",
	"ret": 1
	}

2、Close File

Function	Close file without saving
Parameter	none
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	“sid”: 0,
	“cmd”: “close_file”,
	}

Return	{

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	"sid": 0, "cmd": " close_file ", "ret": 1 }

3、Save Document

Function	Save document
Parameter	Path; file path canCover 0: Uncoverable 1: Coverable
Returned Value	ret 1: Saved successfully 0: Not executed -1: The file already exists, the operation is not allowed to overwrite -2: The file name is wrong

Request	{
	"sid": 0,
	"cmd": "save_file",
	"data": {
	"path": "./document1.emd",
	"cover": 0
	}
	}

Return	{
	"sid": 0,
	"cmd": " save_file ",
	"ret": 1
	}

2.2 Scanhead Operation

1、Software Running Status

Function	Get software running status
Parameter	None
Returned Value	ret 0: Waiting 1: Marking 2: Previewing 3: Already working, marking or previewing not started yet

Request	{
	"sid": 0,
	"cmd": "get_working_status"
	}

Return	{
	"sid": 0,
	"cmd": " get_working_status "
	"ret": 1
	}

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2、Start Marking

Function	Start marking
Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	“sid”: 0,
	“cmd”: “start_mark”
	}

Return	{
	"sid": 0,
	"cmd": " start_mark"
	"ret": 1
	}

3、Stop Marking

Function	Stop marking
Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	“sid”: 0,
	“cmd”: “stop_mark”
	}

Return	{
	"sid": 0,
	"cmd": " stop_mark "
	"ret": 1
	}

4、Start Preview

Function	Start preview
Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	“sid”: 0,
	“cmd”: “start_preview”
	}

Return	{ "sid": 0, "cmd": " start_preview " "ret": 1

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	}

5、Stop Preview

Function	Stop preview
Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	“sid”: 0,
	“cmd”: “stop_preview”
	}

Return	{
	"sid": 0,
	"cmd": " stop_preview "
	"ret": 1
	}

2.3 Parameter Operation

1、Get the Marking Parameter Based on the Layer Number

Function	Get the marking Parameter based on the layer number
Parameter	layer_id Layer number
Returned Value	iLayer: Layer index 0 – 254 markSpeed: Marking speed jumpSpeed: Jump speed jumpDelay: Jump delay laserOnDelay: Light on delay polygonDelay: Polygon delay laserOffDelay: Laser off delay polygonKillerTime: Polygon killer time laserFrequency: Laser frequency current: YAG, SPI current (A) IPG energy (%) firstPulseKillerLength: AG first pulse suppression pulse width (us) pulseWidth: Pulse width(us) firstPulseWidth: CO2 first pulse width (%) incrementStep: CO2 first pulse suppression increment step size (%)

Request	{
	"sid": 0,
	"cmd": "get_markParameters_by_layer",
	"data": {

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	"layer_id”:1 } }

Return	{
	"sid": 0,
	"cmd": "get_markParameters_by_layer",
	"ret": 1,
	"data": {
	"layer_id": 1,
	"markSpeed": 3000,
	"jumpSpeed": 5000,
	"jumpDelay": 100,
	"laserOnDelay": 100,
	"polygonDelay": 100,
	"laserOffDelay": 100,
	"polygonKillerTime": 100,
	"laserFrequency": 100,
	"current": 100,
	"firstPulseKillerLength": 100,
	"pulseWidth": 100,
	"firstPulseWidth": 100,
	"incrementStep": 100
	}
	}

2、Modify the Marking Parameter According to the Layer Number

Function	Modify the marking Parameter according to the layer number
Parameter	layer_id layer number
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "set_markParameters_by_layer",
	"data": {
	"layer_id": 1,
	"markSpeed": 3000,
	"jumpSpeed": 5000,
	"jumpDelay": 100,
	"laserOnDelay": 100,
	"polygonDelay": 100,
	"laserOffDelay": 100,
	"polygonKillerTime": 100,
	"laserFrequency": 100,
	"current": 100,

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	"firstPulseKillerLength": 100, "pulseWidth": 100, "firstPulseWidth": 100, "incrementStep": 100 } }

Return	{
	"sid": 0,
	"ret": 1,
	"cmd": "set_markParameters_by_layer"
	}

3、Get the Marking Parameter Based on the Index

Function	Get the marking Parameter based on the index
Parameter	index
Returned Value	

Index	Index
In_index	Internal index: -1 outline, 0 1 2 fill layer
markSpeed	Marking speed
jumpSpeed	Jump speed
jumpDelay	Jump delay
laserOnDelay	Laser on delay
polygonDelay	Polygon delay
laserOffDelay	Laser off delay
polygonKillerTime	Polygon killer time
laserFrequency	Laser frequency
Current	YAG, SPI current (A) IPG energy (%)
firstPulseKillerLength	AG first pulse suppression pulse width (us)
pulseWidth	Pulse width(us)
firstPulseWidth	CO2 first pulse width (%)
incrementStep	CO2 first pulse suppression increment step size (%)

Request	{
	"sid": 0,
	"cmd": "get_markParameters_by_index",
	"data": {
	"index":1,
	"in_index": -1
	}
	}

Return	{ "sid": 0, "ret": 1,

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	"data": {
	"index": 1,
	"in_index": -1,
	"markSpeed": 3000,
	"jumpSpeed": 5000,
	"jumpDelay": 100,
	"laserOnDelay": 100,
	"polygonDelay": 100,
	"laserOffDelay": 100,
	"polygonKillerTime": 100,
	"laserFrequency": 100,
	"current": 100,
	"firstPulseKillerLength": 100,
	"pulseWidth": 100,
	"firstPulseWidth": 100,
	"incrementStep": 100
	}
	}

4、Modify Marking Parameter Based on Index

Function	Modify marking Parameter based on index
Parameter	index
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "set_markParameters_by_index",
	"data": {
	"index": 1,
	"in_index": -1,
	"markSpeed": 3000,
	"jumpSpeed": 5000,
	"jumpDelay": 100,
	"laserOnDelay": 100,
	"polygonDelay": 100,
	"laserOffDelay": 100,
	"polygonKillerTime": 100,
	"laserFrequency": 100,
	"current": 100,
	"firstPulseKillerLength": 100,
	"pulseWidth": 100,
	"firstPulseWidth": 100,
	"incrementStep": 100
	}

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	}

Return	{
	"sid": 0,
	"ret": 1,
	"data": {
	"index": 1,
	"in_index": -1,
	"markSpeed": 3000,
	"jumpSpeed": 5000,
	"jumpDelay": 100,
	"laserOnDelay": 100,
	"polygonDelay": 100,
	"laserOffDelay": 100,
	"polygonKillerTime": 100,
	"laserFrequency": 100,
	"current": 100,
	"firstPulseKillerLength": 100,
	"pulseWidth": 100,
	"firstPulseWidth": 100,
	"incrementStep": 100
	}
	}

5、Download Marking Parameter

Function	Download marking Parameter
Parameter	None
Returned Value	ret 1: Successfully executed 0: Not executed

Request	{
	“sid”: 0,
	“cmd”: “download_Parameters”
	}

Return	{
	"sid": 0,
	"cmd": " download_Parameters"
	"ret": 1
	}

6、Get the Populated Parameter Based on the Index

Function	Get the populated Parameter based on the index	
Parameter	index	object index
	in_index	Internal indexes 0, 1, and 2 are three-layer filling Parameters respectively.
	iFillMode	Fill type 0: No filling

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		1: One-way filling 2: Two-way filling 3: Bow-shaped filling 4: Back-shaped filling
Returned Value	bEqualDistance	Evenly distribute fill lines
	bSecondFill	Whether to enable second padding
	bRotateAngle	Automatic rotation angle
	bFillAsOne	Objects are calculated as a whole
	bMoreIntact	Whether to optimize two-way filling to make the border more complete
	bFill3D	Whether to use triangle fill mode
	loopNum	Number of boundary rings
	iFillMarkTimes	Number of markings for the current angle
	iCurMarkTimes	Current number of markings
	layerId	Fill in pen number
	fillSpace,	//fill line space
	fillAngle,	// fill angle
	fillEdgeOffset,	// Fill edge offset
	fillEdgeOffset,	//Fill edge offset
	fillEndOffset,	//Fill end offset
	fillLineReduction,	//Fill line reduction
	loopSpace,	//Loop space
	secondAngle,	// The fill angle of the second fill
	dRotateAngle	// The angle of each increment

Request	{
	"sid": 0,
	"cmd": "get_entity_fill_property_by_index",
	"data": {
	"index": 1,
	"in_index": 1,
	}
	}	

Return	{
	"sid": 0,
	"cmd": "get_entity_fill_property_by_index",
	"ret": 1,
	"data": {
	"index": 1,
	"in_index": 1,
	"fill_mode": 1,
	" bEqualDistance": false,
	" bSecondFill ": false,	

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```
                " bRotateAngle ": false,
                " bFillAsOne ": false,
                " bMoreIntact ": false,
                " bFill3D ": false,
                " loopNum ": 1,
                " iFillMarkTimes": 1,
                " iCurMarkTimes ": 12,
                " layerId ": 1,
                " fillSpace ": 100,
                " fillAngle ": 100,
                " fillEdgeOffset ": 100,
                " fillStartOffset ": 100" fillEndOffset ": 1,
                " fillLineReduction ": 100,
                " loopSpace ": 100,
                " secondAngle ": 100,
                " dRotateAngle ": 100
            }
}
```


7、Populate Parameter Based on Index Modification

Function	Populate Parameter based on index modification	
Parameter	index	object index
	in_index	Internal indexes 0, 1, and 2 are three-layer filling Parameters respectively.
	iFillMode	Fill type 0: No filling 1: One-way filling 2: Two-way filling 3: Bow-shaped filling 4: Back-shaped filling
	bEqualDistance	Evenly distribute fill lines
	bSecondFill	Whether to enable second padding
	bRotateAngle	Automatic rotation angle
	bFillAsOne	Objects are calculated as a whole
	bMoreIntact	Whether to optimize two-way filling to make the border more complete
	bFill3D	Whether to use triangle fill mode
	loopNum	Number of boundary rings
	iFillMarkTimes	Number of markings for the current angle
	iCurMarkTimes	Current number of markings
	layerId	Fill in pen number
	fillSpace,	//Fill space
	fillAngle,	//Fill angle
	fillEdgeOffset,	//Fill edge offset

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	fillEdgeOffset,	//Fill edge offset
	fillEndOffset,	//Fill end offset
	fillLineReduction,	//Fill line reduction
	loopSpace,	//Loop space
	secondAngle,	// The fill angle of the second fill
	dRotateAngle	// The angle of each increment

Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": set_entity_fill_property_by_index,
	"data": {
	"index": 1,
	"in_index": 1,
	"fill_mode": 1,
	" bEqualDistance": false,
	" bSecondFill ": false,
	" bRotateAngle ": false,
	" bFillAsOne ": false,
	" bMoreIntact ": false,
	" bFill3D ": false,
	" loopNum ": 1,
	" iFillMarkTimes": 1,
	" iCurMarkTimes ": 12,
	" layerId ": 1,
	" fillSpace ": 100,
	" fillAngle ": 100,
	" fillEdgeOffset ": 100,
	" fillStartOffset ": 100" fillEndOffset ": 1,
	" fillLineReduction ": 100,
	" loopSpace ": 100,
	" secondAngle ": 100,
	" dRotateAngle ": 100
	}
	}

Return	{
	"sid": 0,
	"cmd": set_entity_fill_property_by_index,
	"ret": 1
	}

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2.4 Primitive Operation Function

1、Get the Number of Processing Objects

Function	Get the number of objects processed
Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed count The number of objects obtained

Request	{
	"sid": 0,
	"cmd": "get_entity_count",
	}

Return	{
	"sid": 0,
	"cmd": "get_entity_count"
	"ret": 1,
	"data": {"count":1}
	}

2、Pan Template

Function	Translate all objects in the template
Parameter	dx: x offset dy: y offset
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "translate_entity",
	"data": {
	"dx": 0,
	"dy": 0
	}
	}

Return	{
	"sid": 0,
	"cmd": "translate_entity ",
	"ret": 1
	}

3、Rotate Template

Function	Rotate all objects in template
Parameter	cx rotation center point x cy rotation center point y fAngle rotation angle (radians value)

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Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "rotate_entity",
	"data": {
	"cx": 0,
	"cy": 0,
	"fAngle": 0
	}
	}

Return	{
	"sid": 0,
	"cmd": "rotate_entity ",
	"ret": 1
	}

4、Translate Object Based on Index

Function	Translate object based on index
Parameter	index: object index dx: x offset dy: y offset
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "translate_entity_by_index",
	"data": {
	"index": 0,
	"dx": 0,
	"dy": 0
	}
	}

Return	{
	"sid": 0,
	"cmd": "translate_entity_by_index ",
	"ret": 1
	}

5、Rotate Object Based on Index

Function	Rotate object based on index
Parameter	index: object index cx spin center storex cy rotating center store y

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	f Angle rotation angle (radians value)
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "rotate_entity_by_index ",
	"data": {
	"index": 0,
	"cx": 0,
	"cy": 0,
	"fAngle": 1.75
	}
	}

Return	{
	"sid": 0,
	"cmd": "rotate_entity_by_index ",
	"ret": 1
	}

6、Model Transformation (Translation, Rotation, Scaling)

Function	Model transformation (translation, rotation, scaling)
Parameter	dx: X value of translation target point dy: Y value of translation target point dz: Z value of translation target point axis: platform rotation axis ("X", "Y", "Z") fAngle: rotation angle (°) fScale: unified scaling
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "TransByModel",
	"data": {
	"dx": 0,
	"dy": 0,
	"dz": 0,
	"axis":"X",
	"fAngle": 90,
	"fScale": 1,
	}
	}

Return	{ "sid": 0, "cmd": " TransByModel ",

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	"ret": 1 }

7、Get Name Based on Index

Function	Get name based on index
Parameter	index: object index
Returned Value	ret 1: Execution successful 0: Not executed name :name

Request	{
	"sid": 0,
	"cmd": "get_name_by_index",
	"data": {
	"index": 0
	}
	}

Return	{
	"sid": 0,
	"cmd": "get_name_by_index",
	"ret": 1,
	"data": {
	"name": "0"
	}
	}

8、Set Name Based on Index

Function	Set name based on index
Parameter	index: object index name: name
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "set_name_by_index",
	"data": {
	"index": 0,
	"name": "name"
	}
	}

Return	{
	"sid": 0,
	"cmd": "set_name_by_index",
	"ret": 1
	}

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9、Get Content Based on Index

Function	Get content based on index
Parameter	index: object index
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "get_content_by_index",
	"data": {
	"index": 0
	}
	}

Return	{
	"sid": 0,
	"cmd": "get_content_by_index",
	"ret": 1,
	"data": {
	" content": "0"
	}
	}

10、Set Content Based on Index

Function	Set content based on index
Parameter	index: object index content: content
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "set_content_by_index",
	"data": {
	"index": 0,
	" content ": " content "
	}
	}

Return	{
	"sid": 0,
	"cmd": "set_content_by_index",
	"ret": 1
	}

11、Get Object Size and Position Based on Index

Function	Get object size and position based on index
Parameter	index: object index

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Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"cmd": "get_pos_size_by_index",
	"data": {
	"index": 0
	},
	"sid":1
	}

Return	{
	"sid": 0,
	"cmd": "get_pos_size_by_index",
	"ret": 1,
	"data": {
	"xPos": 3.816241979598999,
	"yPos": 12.085675239562988,
	"zPos": 0,
	"xSize": 43.233749389648438,
	"ySize": 6.869999885559082,
	"zSize": 0
	}
	}

12、Set Object Size and Position Based on Index

Function	Set object size and position based on index
Parameter	index: object index name: name
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"cmd":"set_pos_size_by_index",
	"data": {
	"index":0,
	"xPos":3,
	"xSize":43,
	"yPos":12,
	"ySize":6,
	"zPos":0,
	"zSize":0
	},
	"sid":1
	}

Return	{ "sid": 0,

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	"cmd": "set_pos_size_by_index",
	"ret": 1,
	"data": {
	}
	}

13、Get Content Based on Name

Function	Get content based on name
Parameter	name: name
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "get_content_by_name",
	"data": {
	"name":"name"
	}
	}

Return	{
	"sid": 0,
	"cmd": "get_content_by_name",
	"ret": 1,
	"data": {
	"content": "xxxyyy"
	}
	}

14、Set Content Based on Name

Function	Set content based on name
Parameter	name: name content: content
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "set_content_by_name",
	"data": {
	"name": "xx",
	"content": "xxyyzz"
	}
	}

Return	{

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	"sid": 0, "cmd": " set_content_by_name ", "ret": 1 }

15、Delete Objects Based on Index

Function	Delete objects based on index
Parameter	index: object index
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "delete_by_index",
	"data": {
	"index": 0
	}
	}

Return	{
	"sid": 0,
	"cmd": "delete_by_index",
	"ret": 1
	}

16、Copy Objects Based on Index

Function	Copy objects based on index
Parameter	index: object index
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "copy_by_index",
	"data": {
	"index": 0
	}
	}

Return	{
	"sid": 0,
	"cmd": "copy_by_index",
	"ret": 1
	}

17、Mark Objects by Index

Function	Mark objects by index
Parameter	index: object index

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Returned Value	ret 1: Execution successful 0: Not executed
Request	{ "sid": 0, "cmd": "mark_by_index", "data": { "index": 0 } }
Return	{ "sid": 0, "cmd": "mark_by_index", "ret": 1 }

2.5 Input and Output Operation Functions

1、Read Input

Function	Read input Function
Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed
Request	{ "sid": 0, "cmd": "read_input", "data": { "data":0xff } }
Return	{ "sid": 0, "cmd": "read_input", "ret": 1, "data": { "input": 0xFE } }

2、Set Output

Function	Set output Function
Parameter	output: The io status that needs to be output

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Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "write_output",
	"data": {
	"output": 1
	}
	}

Return	{
	"sid": 0,
	"cmd": "write_output",
	"ret": 1,
	"data": {
	"output": 1
	}
	}

2.6 Alarm Operation

1、Get Run Error

Function	clear errors
Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "clear_error"
	}

Return	{
	"sid": 0,
	"cmd": "clear_error",
	"ret": 1
	}

2、Get Error

Function	Get error
Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed
Request	{ "sid": 0,

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	"cmd": "get_error" }

Return	{
	"sid": 0,
	"cmd": "get_error",
	"ret": 1
	"data": {
	"describe":" Failed to open board "
	}
	}

Returned Value the Corresponding Error Content is Described as Follows:

Returned Value	Illustrate
-1	Dongle not found
0	success
1	Failed to open board
2	The USB interface is not a 2.0 interface
3	Failed to open cache area
4	The time in the board is greater than the current computer time
5	Authorization expires
6	Failed to load authorization (the ID.txt authorization file in the Lincense folder in the current directory needs to be updated)
7	Failed to load FPGA driver
8	Failed to set system Parameter
9	Setting calibration failed
10	Setting up stepper motor failed
11	Failed to set up laser
12	Failed to download marking Parameter
13	Marking object does not exist
14	Marking Parameter is invalid
15	Laser status error
16	scanhead status error
17	Failed to obtain scanhead or laser status
18	Initialization failed before starting marking
19	Failed to start the number sending thread
20	Object content update failed before decomposing data (automatic variable update failed)
21	The object exceeds the marking range
22	Failed to update the content of the data decomposition end object.
23	File read error
24	File save error

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25	The object does not exist and the move and rotate command cannot be executed.
26	The object is not text or barcode, and the content replacement operation cannot be performed.
27	Object with specified name not found
28	Marking cannot be started while marking is in progress.
29	Invalid scope of work
30	No control card connected
31	Object content update failed
32	file does not exist
33	Index Parameter is out of range
34	Object does not exist
35	The input Parameter pointer is null
36	Failed to modify object name
37	The layer number where the object is located does not exist
38	Preview cannot be started while marking is in progress
39	While marking is in progress, the preview cannot be started repeatedly.
40	Preview cannot be stopped while marking.
41	No preview object exists
42	Preparing for preview failed
43	Hardware stop signal, external emergency stop
44	Failed to enable the visual positioning module (the dongle does not contain its Function)

2.7 Visual Function

1、Start the Visual Positioning Function

Function	Start the visual positioning function
Parameter	Is bEnVision enabled?
Returned Value	ret 1: Execution successful 0: Not executed
Notice	Visual Function related interfaces can only be used after authorization.

Request	<pre>{
	"sid": 0,
	"cmd": "enable_vision",
	"data": {
	"bEnVision": true
	}
	}</pre>

Return	{

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	"sid": 0, "cmd": "enable_vision", "ret": 1 }

2、Visual Positioning Translation

Function	Set offset function
Parameter	dX: abscissa offset dY: vertical coordinate offset

Request	{
	"sid": 0,
	"cmd": "vision_translate",
	"data": {
	"dX ": 0.0,
	"dY ": 0.0
	}
	}

Return	{
	"sid": 0,
	"cmd": "vision_translate",
	"ret": 1
	}

3、Visual Orientation Rotation

Function	Set rotation, rotate the radian fAngle around the position specified by cx and cy
Parameter	cX: Center abscissa cY: center ordinate fAngle: Radian value of rotation, positive value: counterclockwise rotation, negative value: clockwise rotation
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "vision_rotate",
	"data": {
	"cX ": 0.0,
	"cY ": 0.0,
	" fAngle ": 0.0
	}
	}

Return	{ "sid": 0, "cmd": "vision_rotate",

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	"ret": 1 }

2.8 Stepper Motor Function

1、Stepper Motor Zero Return Function

Function	Stepper motor zero Return function
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "step_motor_home",
	"data": {
	"axis" :0
	}
	}

Return	{
	"sid": 0,
	"cmd": "step_motor_home",
	"ret": 1
	}

2、Stepper Motor Relative Position Movement

Function	Stepper motor relative position movement function
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis offset: offset position
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "step_motor_move",
	"data": {
	"axis" :0
	"offset" :0
	}
	}

Return	{
	"sid": 0,
	"cmd": "step_motor_move",
	"ret": 1
	}

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3、Stepper Motor Absolute Position Movement

Function	Stepper motor absolute position movement Function
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis pos: absolute position
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": " step_motor_move_to ",
	"data": {
	"axis" :0
	"pos" :0
	}
	}

Return	{
	"sid": 0,
	"cmd": " step_motor_move_to ",
	"ret": 1
	}

4、Stepper Motor Gets Current Position

Function	Stepper motor gets current position
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis pos: absolute position
Returned Value	ret 1: Execution successful 0: Not executed axis: Query axis number pos: query axis position

Request	{
	"sid": 0,
	"cmd": " step_motor_get_position ",
	}

Return	{
	"sid": 0,
	"cmd": "step_motor_get_position",
	"ret": 1,
	"data": {
	"axis" :0,
	"pos" :0
	}
	}

5、Stepper Motor Gets Current Status

Function	Stepper motor gets current status

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Parameter	None
Returned Value	ret 1: Execution successful 0: Not executed xState: x-axis status 1 moving 0 stopped yState: y-axis status 1 moving 0 stopped zState: z-axis status 1 moving 0 stopped rState: r axis status 1 moving 0 stopped

Request	{
	"sid": 0,
	"cmd": "step_motor_get_state"
	}

Return	{
	"sid": 0,
	"cmd": "step_motor_get_state",
	"ret": 1,
	"data": {
	"xState" :0.
	"yState" :0
	"zState" :0.
	"rState" :0
	}
	}

6、Stepper Motor Obtains Zero Position Status

Function	Stepper motor obtains zero position status
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis pos: absolute position
Returned Value	ret 1: Execution successful 0: Not executed xHome: Whether the x-axis is at the zero position, 1 is at the zero position, 0 is not at the zero position yHome: Whether the y-axis is at the zero position, 1 is at the zero position, 0 is not at the zero position zHome: Whether the z-axis is at the zero position, 1 is at the zero position, 0 is not at the zero position rHome: Whether the r-axis is at the zero position, 1 is at the zero position, 0 is not at the zero position

Request	{
	"sid": 0,
	"cmd": " step_motor_get_home_state "
	}

Return	{
	"sid": 0,
	"cmd": " step_motor_get_home_state ",
	"ret": 1,
	"data": {

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	"xHome" :0. "yHome" :0 "zHome" :0. "rHome" :0 } }

7、Stepper Motor Count Clear

Function	Stepper motor gets current position
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "step_motor_zero_counter",
	"data": {
	"axis" :0
	}
	}

Return	{
	"sid": 0,
	"cmd": "step_motor_zero_counter",
	"ret": 1
	}

8、Stepper Motor Obtains Limit Switch Status

Function	Stepper motor obtains limit switch status
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis
Returned Value	ret 1: Execution successful 0: Not executed xLimit: Whether the x-axis limit is triggered 1 triggered 0 not triggered yLimit: Whether the y-axis limit is triggered. 1 is triggered. 0 is not triggered. zLimit: Whether the z-axis limit is triggered. 1 is triggered. 0 is not triggered. rLimit: Whether the r axis triggers the limit 1 triggers 0 not triggers

Request	{
	"sid": 0,
	"cmd": " step_motor_limit_state "
	}

Return	{
	"sid": 0,
	"cmd": " step_motor_limit_state ",
	"data": {

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	"xLimit" :0. "yLimit" :0 "zLimit" :0. "rLimit" :0 } "ret": 1 }

9、Stepper Motor Stops

Function	Stepper motor stops
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "step_motor_stop",
	"data": {
	"axis" :0
	}
	}

Return	{
	"sid": 0,
	"cmd": "step_motor_stop",
	"ret": 1
	}

10、Stepper Motor Gets Running Parameter

Function	Stepper motor gets running Parameter
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis offset: offset position
Returned Value	ret 1: Execution successful 0: Not executed axis: query axis number fSSpeed: starting speed fSpeed: speed fSpeedUpTime: acceleration time

Request	{
	"sid": 0,
	"cmd": "step_motor_get_move_para",
	"data": {
	"axis" :0
	}
	}

Return	{ "sid": 0,

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	"cmd": "step_motor_get_move_para",
	"ret": 1,
	"data": {
	"axis" :0.
	"fSSpeed" :0
	"fSpeed" :0
	"fSpeedUpTime" :0
	}
	}

11、Stepper Motor Settings Run Parameter

Function	Stepper motor settings run Parameter
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis fSSpeed: starting speed fSpeed: speed fSpeedUpTime: acceleration time
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "step_motor_set_move_para",
	"data": {
	"axis" :0.
	"fSSpeed" :0
	"fSpeed" :0
	"fSpeedUpTime" :0
	}
	}

Return	{
	"sid": 0,
	"cmd": "step_motor_set_move_para",
	"ret": 1
	}

12、Stepper Motor Gets Back to Zero Parameter

Function	Stepper motor gets back to zero Parameter
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "step_motor_get_home_para",
	"data": {
	"axis" :0

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	} }

Return	{
	"sid": 0,
	"cmd": "step_motor_get_home_para",
	"ret": 1,
	"data": {
	"axis" :0,
	"dHomeSpeed" :100
	}
	}

13、Stepper Motor Setting Back to Zero Parameter

Function	Stepper motor setting back to zero Parameter
Parameter	axis motor axis 0: x axis, 1: y axis, 2: z axis, 3: r axis
Returned Value	ret 1: Execution successful 0: Not executed

Request	{
	"sid": 0,
	"cmd": "step_motor_set_home_para",
	"data": {
	"axis" :0
	}
	}

Return	{
	"sid": 0,
	"cmd": "step_motor_set_home_para",
	"ret": 1,
	"data": {
	"axis" :0,
	"dHomeSpeed" :100
	}
	}

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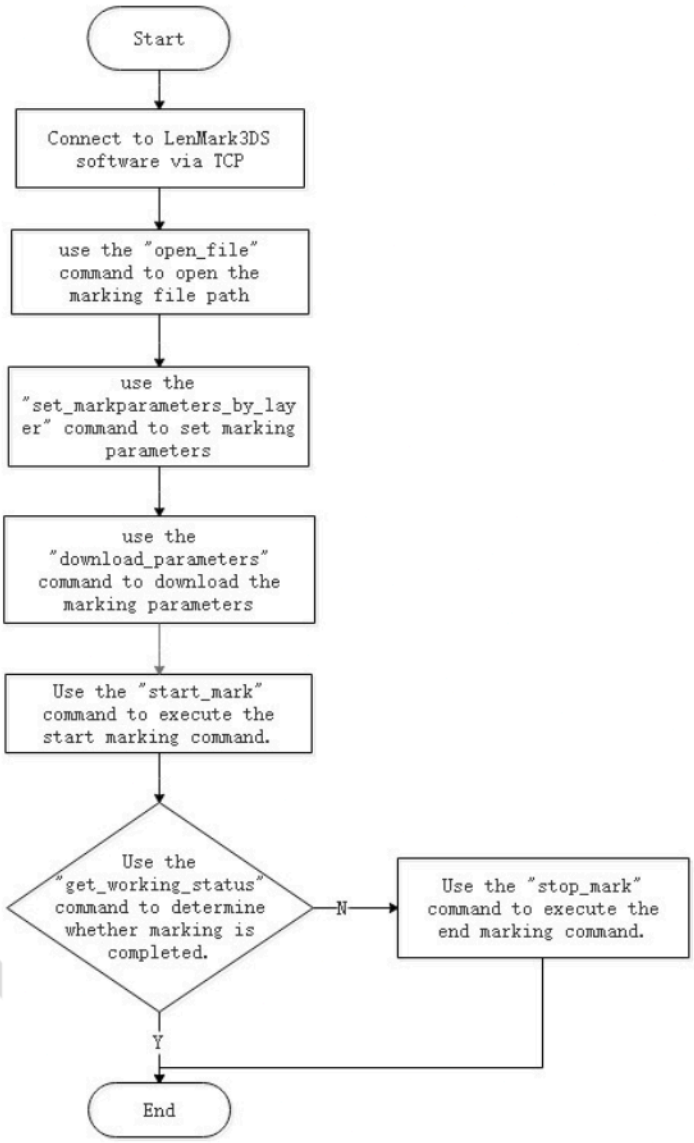
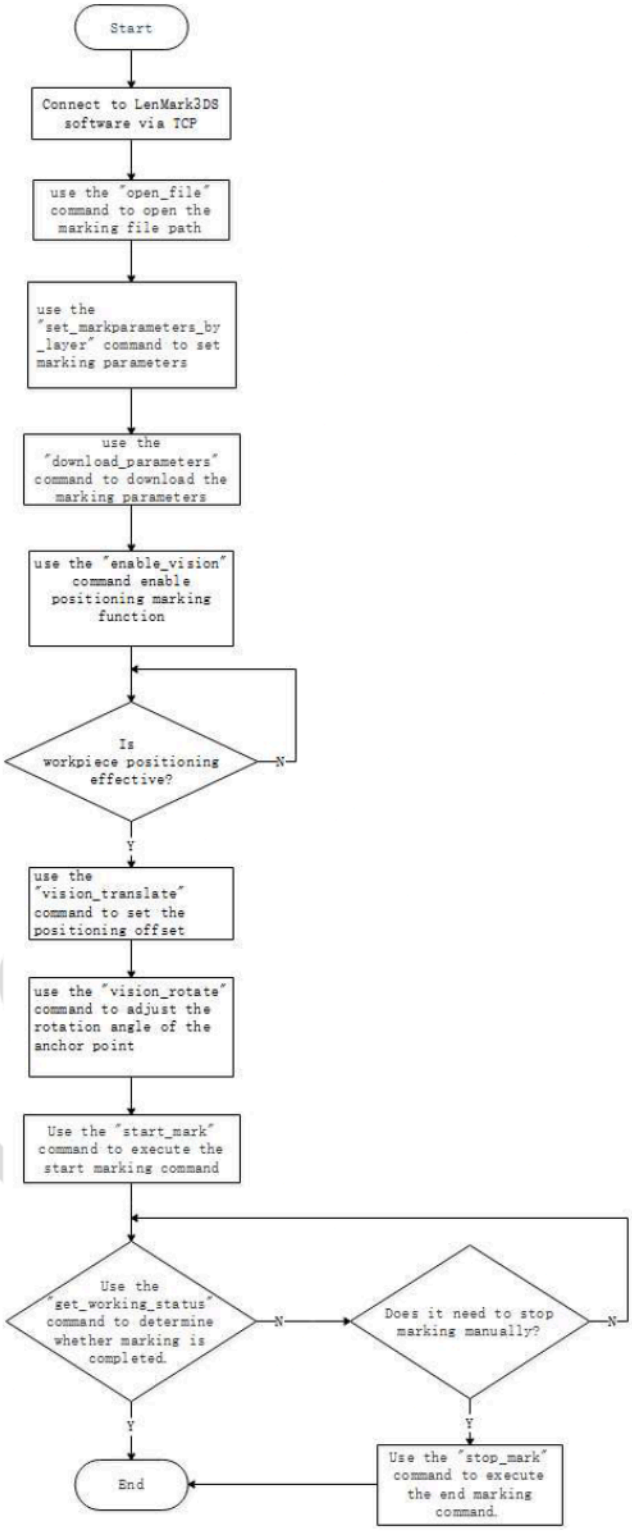
3、Interface Calling Process

3.1 Schematic Diagram of the Overall Software Workflow

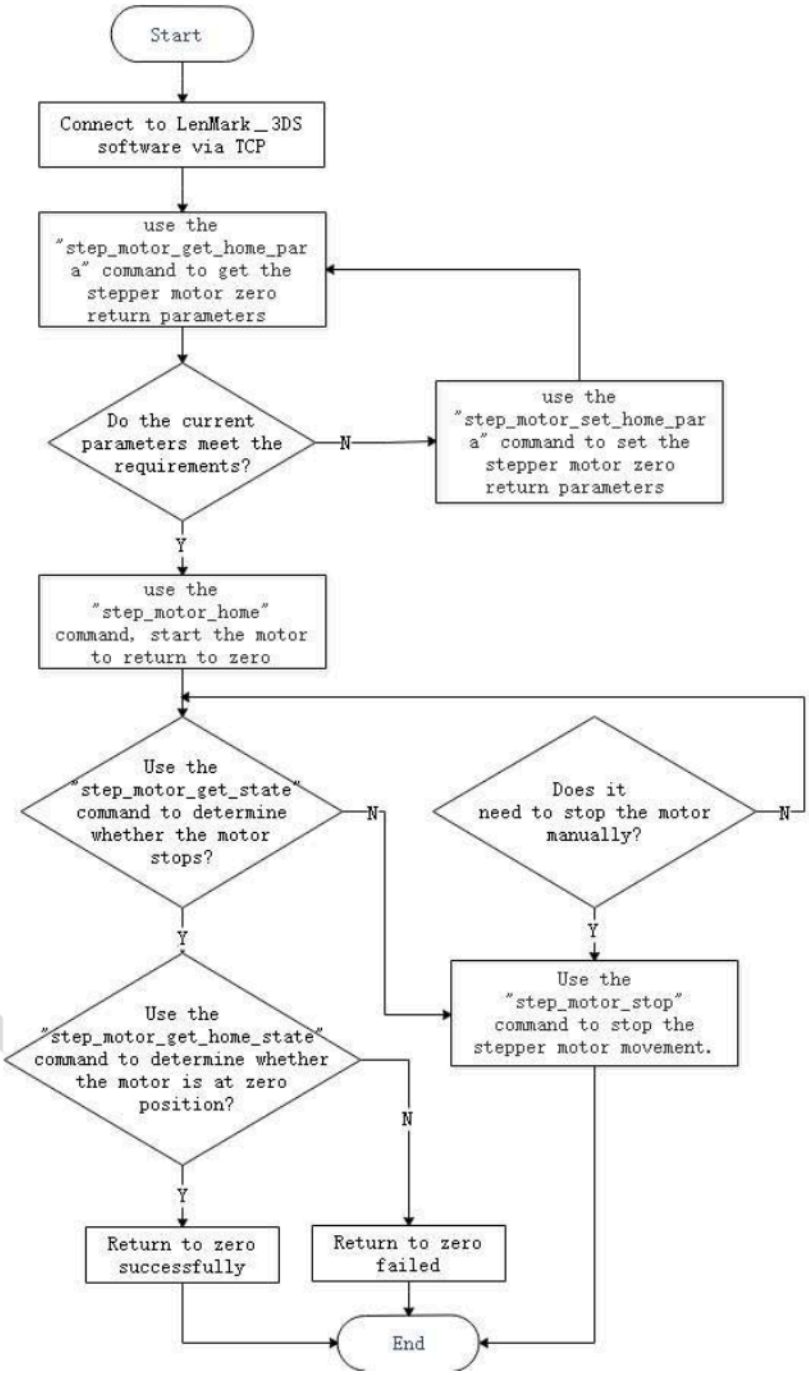
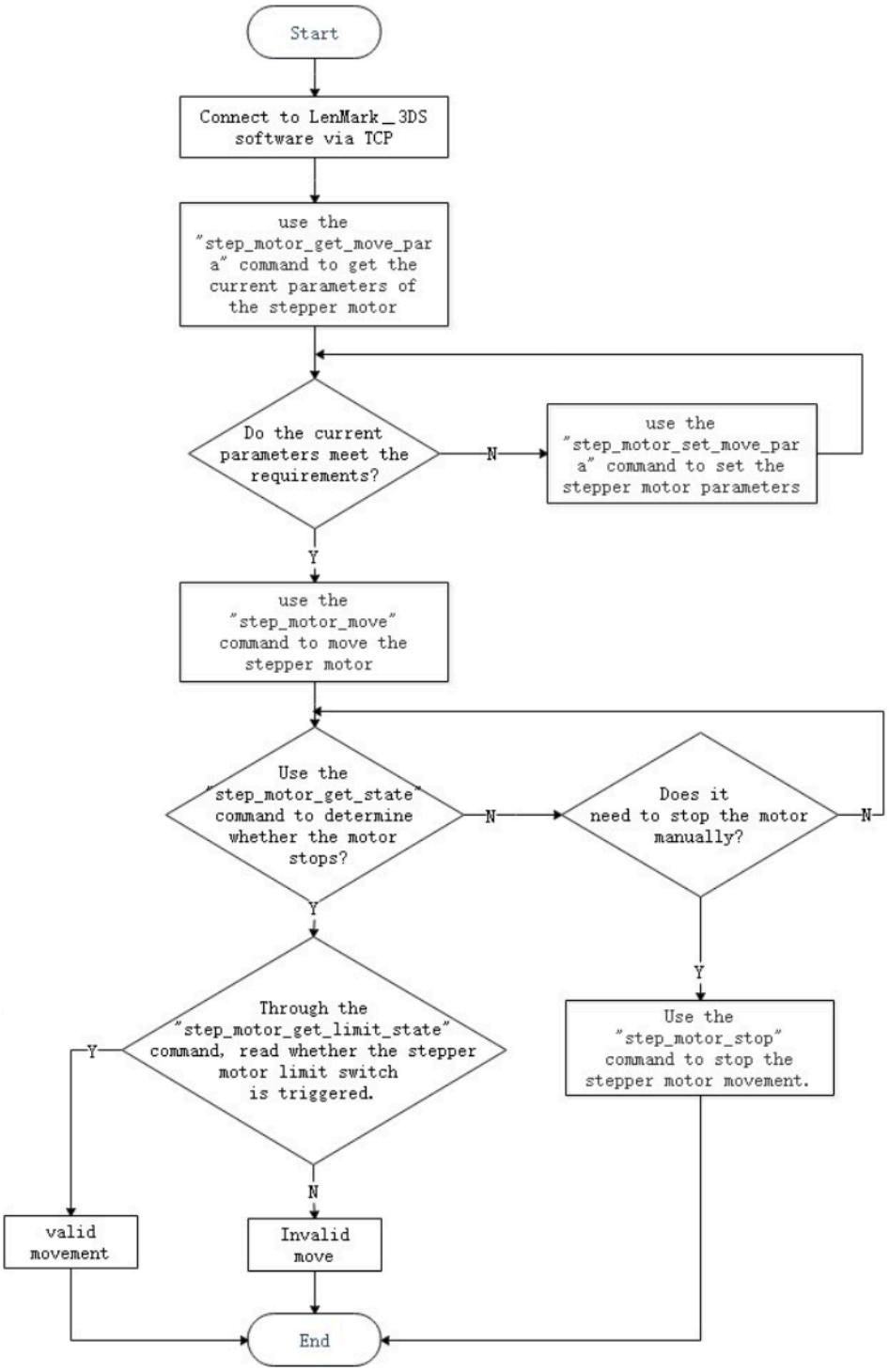


3.2 CCD Calling Process Diagram



3.3 Motor Shaft Control Diagram

1、Motor Returns to Zero



2、Motor Movement