

IR Laser Illuminator
Model No. : VM-S600

User Manual



Content List

	(Pages)
User Manual History	3
Description, Features, Application	4
1. Profile	5
2. Specifications	6
3. Installation and Electrical Interface	7
3.1 Mechanical Schematic	7
3.2 Electrical Interface	8
4. Protocols	9
4.1 Protocol format	9
4.2 Command list	10
4.3 Command	11~17
5. VM Control Program	18
5.1 Port Control	19
5.2 Target Product	19
5.3 LD Command	19
5.4 Motor Command	20
5.5 FAN Command	20
5.6 System Command	21
5.7 Log Window	21~22

User Manual History

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Description

The VM series laser illuminator is high performance integrated with high quality VCSEL chip and excellent optics design, and outstanding circuit control with high efficiency.

It has widespread angle zooming, which can match the field view angle of cameras.

User can control the beam angle by controlling a motor that enables to move the optical lenses.

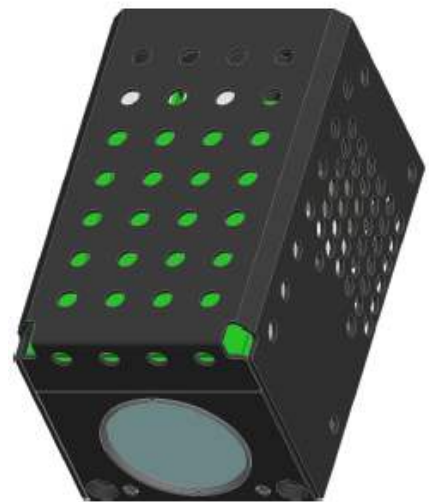
It can be widely used in high-speed dome, PTZ camera, Box camera, Military application.

Features

- Covered Distance : 700m
- Typical Wavelength : $860\pm 10\text{nm}$
- Fan Angle : $1.4\sim 55^\circ$
- Optical Output Power : $4.0\text{W}\pm 10\%$
- Beam Shape : Circular
- Weight : 310g
- Single Operating Voltage : DC 12V
- Protocol Interface : TTL, RS485, RS232
- Matching the Camera Angle
- High Reliability
- Long life time up to 30,000Hours
- Uniform Beam Intensity
- Speckle Free

Application

- PTZ Camera
- Box Camera
- Military Application



1. Profile

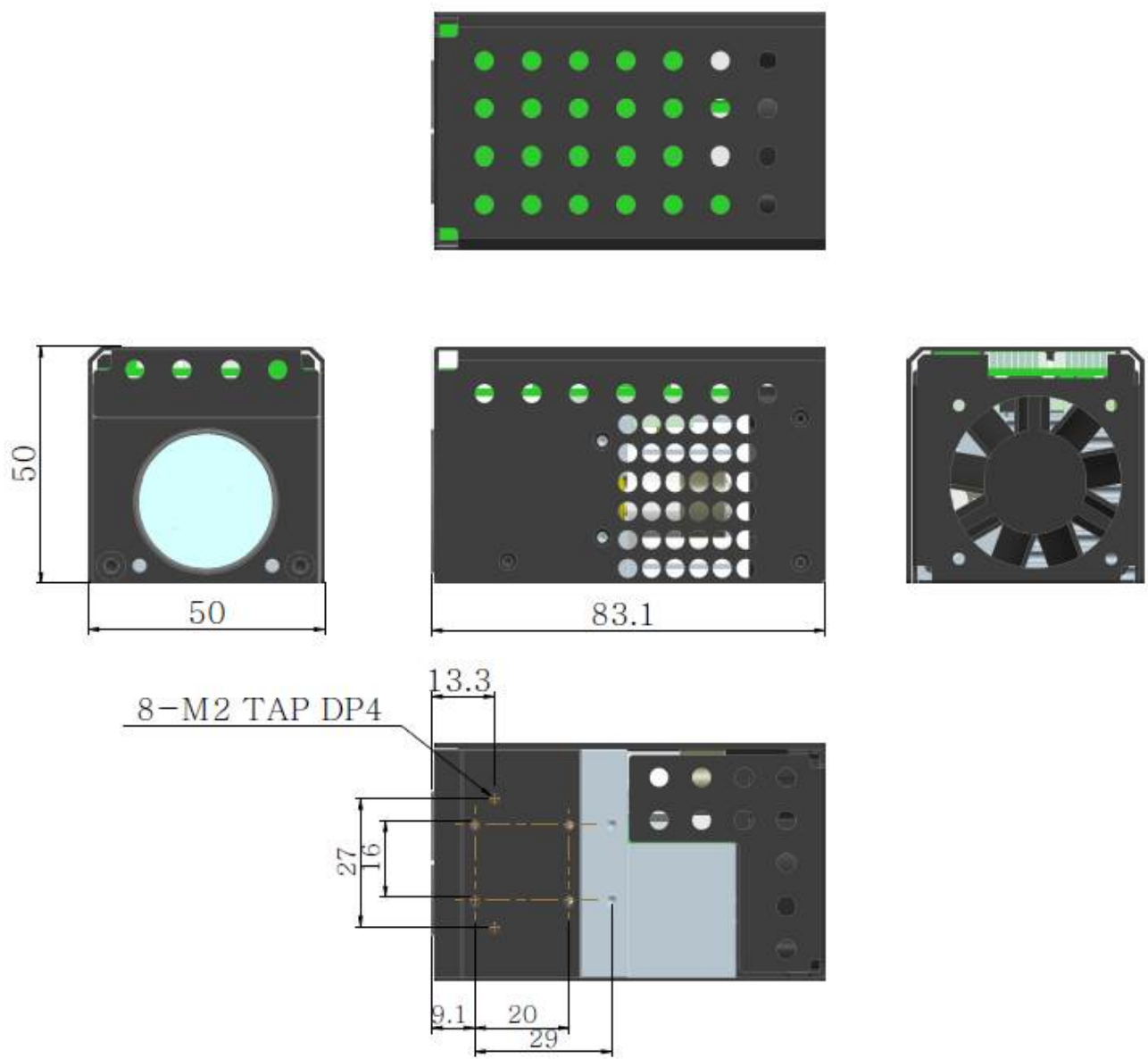
The laser illuminators with the model of VM-S600, is high performance and uniform beam, it is very applicable to high definition imaging for security surveillance and factory applications such as machine vision.

2. Specifications

Parameters	Typical values	Unit	Remarks
Model No.	VM-S600		
Wavelength	860±10	nm	
Optical Output Power	4.0±10%	W	
Beam Shape	Circular		
Illuminating Distance	700	m	
Fan Angle	1.4~55	°	±0.2°
Operating Voltage	12±5%	V	
Operating Current	2.4 (Max.)	A	
Operating Mode	CW		
VCSEL MTTF	30,000	Hours	
Operating Temperature	-30~+60	°C	
Storage Temperature	-40~+70	°C	
Power Consumption	28.8 (Max.)	W	
Dimension	50×50×83.1	mm	
Housing Material	Aluminum and steel		
Laser Class	4		IEC 60825-1
Protocol Interface	TTL, RS485, RS232		
Weight	310	g	

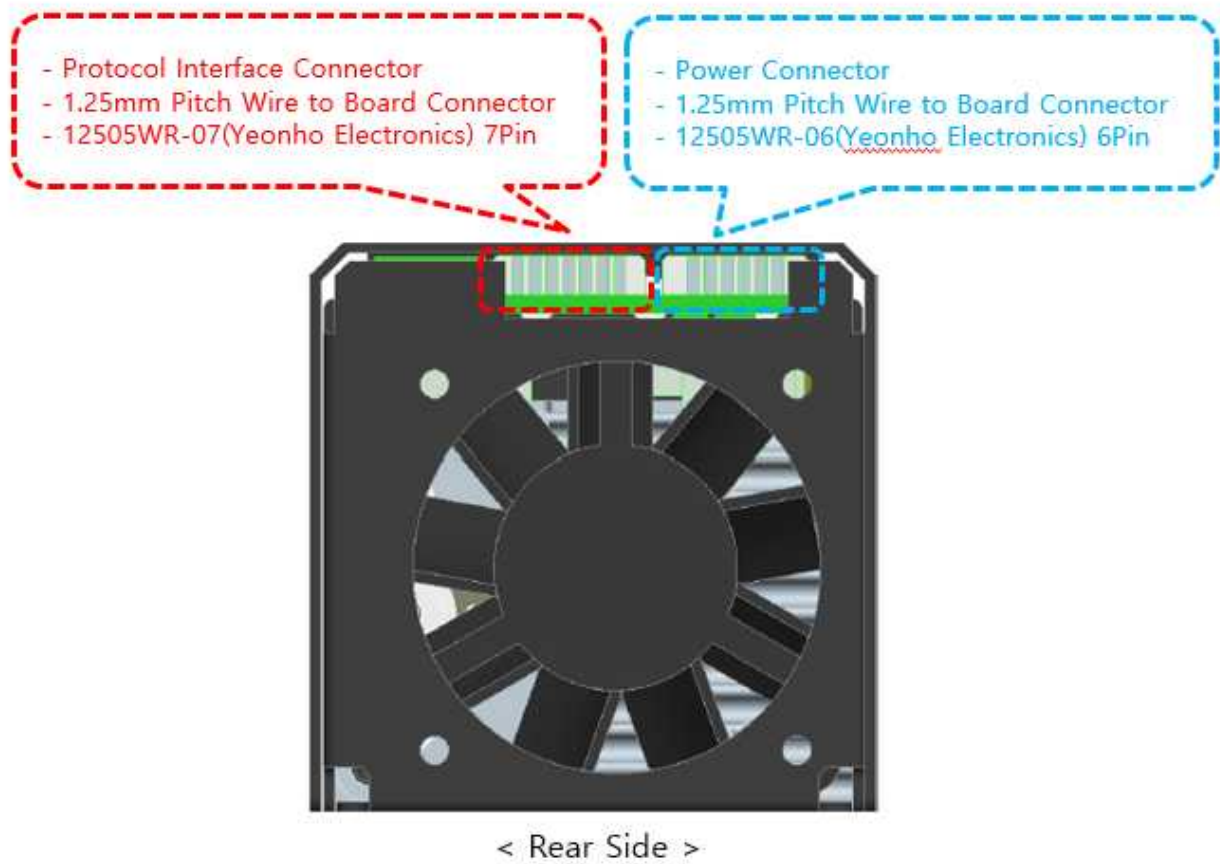
3. Installation and Electrical Interface

3.1 Mechanical Schematic

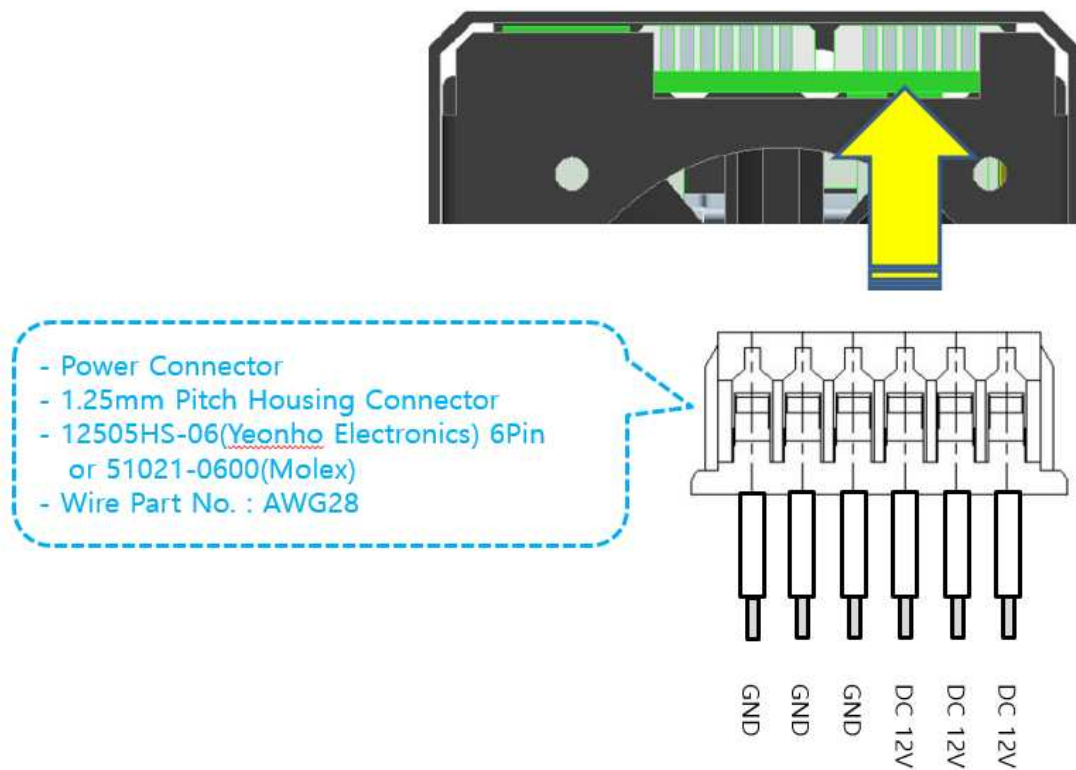


[Unit : mm]

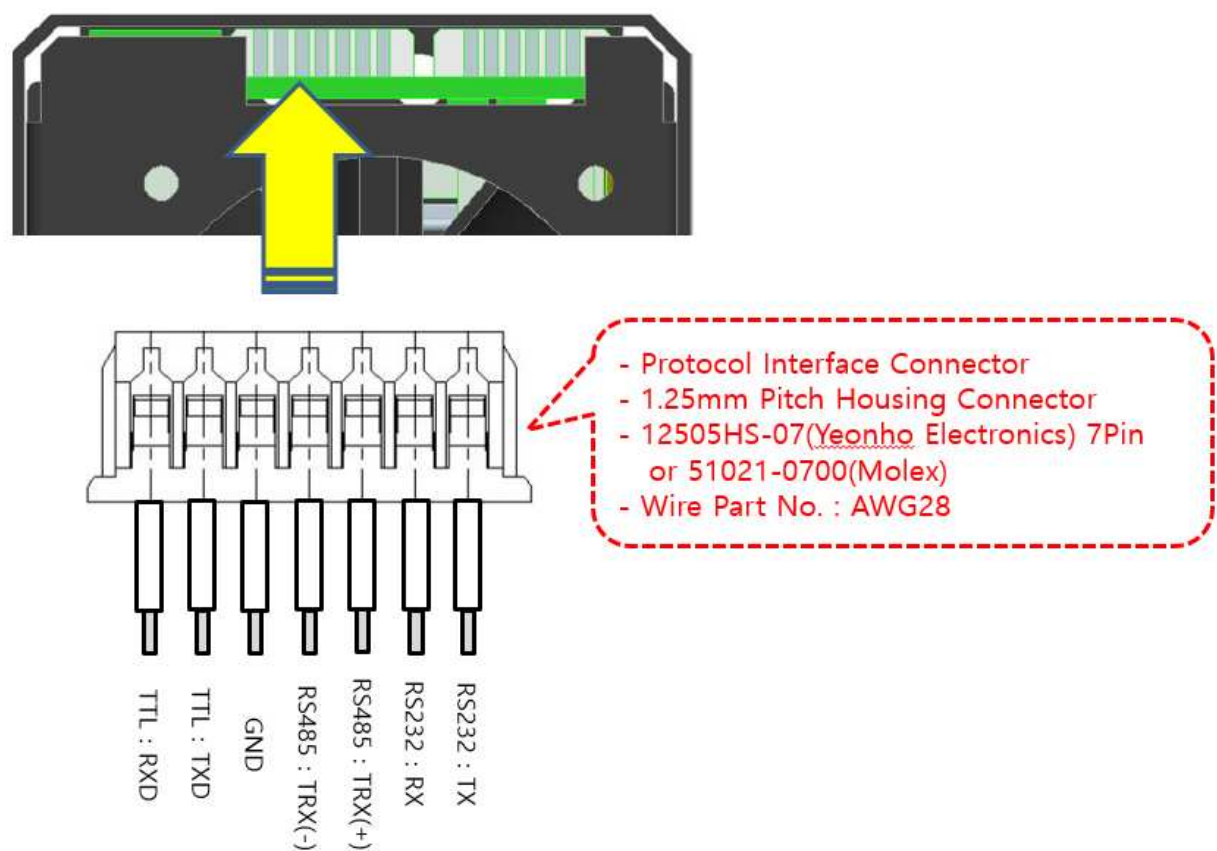
3.2 Electrical Interface



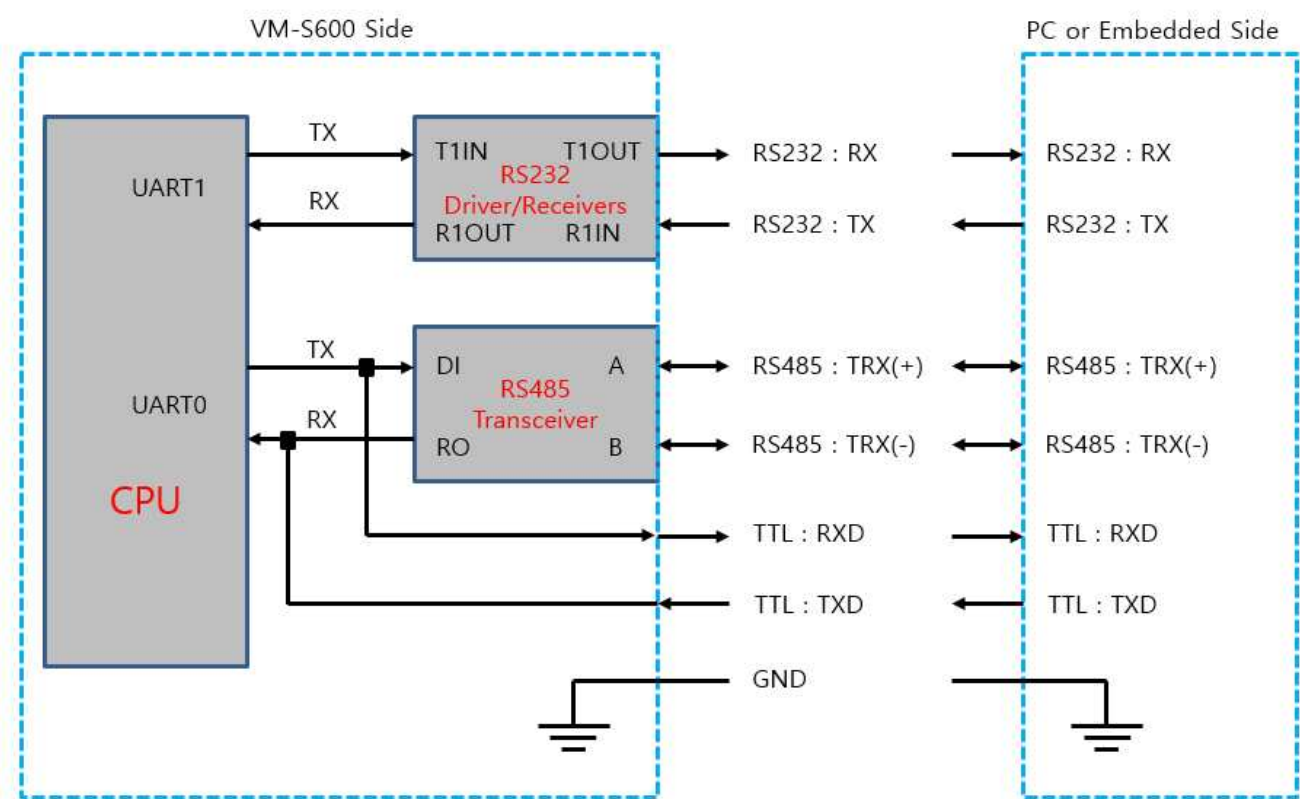
(1) Power



(2) Protocol Interface



- Protocol Interface Diagram



4. Protocols

4.1 Protocol format

HOST -> LASER

Byte	1	2	3	4	5	6~N	N+1	N+2
	STX	SYS ID	HOST ID	CMD	SIZE	DATA	Checksum	ETX
Description		1) STX: 05h 2) SYS ID: 00h 3) HOST ID: 00h 4) SIZE: DATA SIZE 5) Checksum: 0xFF-SUM(SYS ID to DATA) 6) ETX: 06h						

HOST <- LASER

Byte	1	2	3	4	5	6~N	N+1	N+2
	STX	HOST ID	SYS ID	CMD	SIZE	DATA	Checksum	ETX
Description		1) STX: 05h 2) SYS ID: 00h 3) HOST ID: 00h 4) SIZE: DATA SIZE 5) Checksum: 0xFF-SUM(HOST ID to DATA) 6) ETX: 06h						

4.2 Command list

No	CMD Name	CMD No.	Response	Comment
1	SET_LASER	E0h(224d)	Yes	Laser Set Command
2	GET_LASER	E1h(225d)	Yes	Laser Get Command
3	FW_APP_UPDATE_START	90h(144d)	Yes	Firmware update command1
4	FW_BL_UPDATE_START	91h(145d)	Yes	Firmware update command2
5	FW_BL_SET_DATA	92h(146d)	Yes	Firmware update command3
6	FW_BL_UPDATE_FINISH	93h(147d)	Yes	Firmware update command4
7				
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35				

4.3 Command

No	Function	SET_LASER							
1	Remark	1) Set laser							
	Byte	1	2	3	4	5	6~N	N+1	N+2
		STX	ID		CMD	SIZE	DATA	CS	ETX
	Command Packet	05h	SYS ID	HOST ID	E0h	TS1	TD1-TDN	CS	06h
	Ack Packet	05h	HOST ID	SYS ID	E0h	RS1	RD1-RDN	CS	06h
Parameter		TS1, TD1~TDN: Please refer to the following table RS1: Same as TS1, RD1-RDN: Same as TD1-TDN							

TS1	TD1-TDN
01h	<p>[TD1] LASER_LD_STEP_UP (01h) : Increase the output power 1 step</p> <p>[TD1] LASER_LD_STEP_DOWN (02h): Decrease the output power 1 step</p> <p>[TD1] LASER_LD_OUT_STOP (03h): Shut off the output power</p> <p>[TD1] LASER_LD_OUT_START (04h): Start the output power</p> <p>[TD1] LASER_LD_OUT_MAX (05h): Max. output power</p> <p>[TD1] LASER_MOT_STEP_GO (30h): Go 25 step (Become smaller)</p> <p>[TD1] LASER_MOT_STEP_BACK (31h): Back 25 step (Become bigger)</p> <p>[TD1] LASER_MOT_RESET_MOVE (33h): Move to reset position</p> <p>[TD1] LASER_MOT_25_STEP_GO (34h): Go 250 step(1/10)(Become smaller)</p> <p>[TD1] LASER_MOT_25_STEP_BACK (35h): Back 250 step (1/10) (Become bigger)</p> <p>[TD1] LASER_MOT_MID_MOVE (36h): Move to middle position</p> <p>[TD1] LASER_MOT_START_MOVE (37h): Move to end position (Min. beam)</p> <p>[TD1] LASER_MOT_HOME (3Bh): Move to home position of motor (Sensor detection position)</p> <p>[TD1] SYS_SOFT_RESET (62h): Soft reset</p>
02h	<p>[TD1] LASER_LD_STEP_SEL (06h): Output any step</p> <p>[TD2] LD Out Value (00h~64h)</p> <p>[TD1] LASER_LD_INCREASE (07h) : Sequential increment of laser output power</p> <p>[TD2] LD Increase Speed (00h ~ FFh)</p> <p>[TD1] LASER_LD_DECREASE (08h): Sequential decrement of laser output power</p>

	<p>[TD2] LD Decrease Speed (00h ~ FFh)</p> <p>[TD1] LASER_LD_STOP (09h): Stop the sequential increment and sequential decrement of laser output power</p> <p>[TD2] 0x00</p> <p>[TD1] LASER_MOT_INCREASE (38h) : Sequential increment of motor step value</p> <p>[TD2] MOT Increase Speed (00h ~ FFh)</p> <p>[TD1] LASER_MOT_DECREASE (39h): Sequential decrement of motor step value</p> <p>[TD2] MOT Decrease Speed (00h ~ FFh)</p> <p>[TD1] LASER_MOT_STOP (3Ah): Stop the sequential increment and sequential decrement of motor step value</p> <p>[TD2] 0x00</p>
03h	<p>[TD1] LASER_MOT_STEP_MOVE(32h): Move any step</p> <p>[TD2] MOT Move Value (00h~FFh) Low Byte</p> <p>[TD3] MOT Move Value (00h~0Fh) High Byte</p>
04h	<p>[TD1] LASER_MOT_STEP_MOVE(40h): Move any step (Designation motor speed)</p> <p>[TD2] MOT Move Value (00h~FFh) Low Byte</p> <p>[TD3] MOT Move Value (00h~0Fh) High Byte</p> <p>[TD4] MOT Move Speed (00h ~ FFh)</p>

No	Function	GET_LASER							
2	Remark	1) Read the set value of laser							
	Byte	1	2	3	4	5	6~N	N+1	N+2
		STX	ID		CMD	SIZE	DATA	CS	ETX
	Command Packet	05h	SYS ID	HOST ID	E1h	TS1	TD1-TDN	CS	06h
	Ack Packet	05h	HOST ID	SYS ID	E1h	RS1	RD1-RDN	CS	06h
	Parameter	TS1, TD1~TDN: Please refer to the following table RS1, RD1~RDN: Please refer to the following table							
	Remark								

TS1	TD1-TDN
01h	[TD1] LASER_MONITORING (01h): Request current set value [TD1] LASER_FW_VERSION (02h): Request firmware version [TD1] FAN_SENSOR_TEMP (52h): Get the sensing temperature of the fan sensor

RS1	RD1-RDN
06h	TD1= LASER_MONITORING , [RD1] LASER_MONITORING (01h) [RD2] Temp Value (00h ~ FFh) [RD3] LD Out Value (00h ~ 64h) [RD4] MOT Move Value (00h ~ FFh) Low Byte [RD5] MOT Move Value (00h ~ 0Fh) High Byte [RD6] Status Value (00h ~ FFh)
03h	TD1= LASER_FW_VERSION , [RD1] LASER_FW_VERSION (02h) [RD2] App Version (00h~09h) High Byte [RD3] App Version (00h~63h) Low Byte TD1= FAN_SENSOR_TEMP , [RD1] FAN_SENSOR_TEMP (52h) [RD2] Sensor Temp (00h~FFh) Low Byte (The value of multiple by 100 for two decimal places) [RD3] Sensor Temp (00h~FFh) High Byte (The value of multiple by 100 for two decimal places)

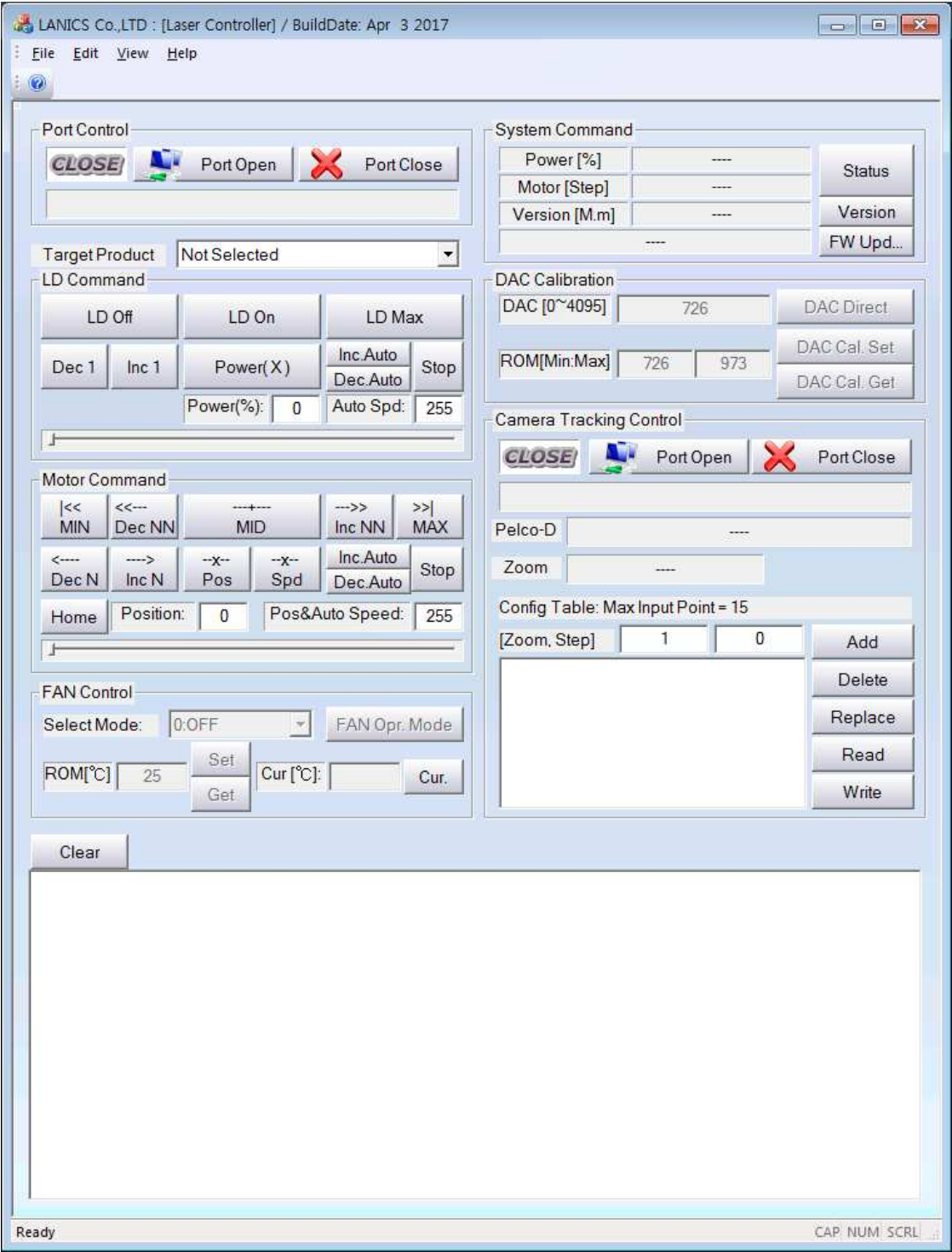
No	Function	FW_APP_UPDATE_START							
3	Remark	1) Jump to bootloader command							
	Byte	1	2	3	4	5	6~N	N+1	N+2
		STX	ID		CMD	SIZE	DATA	CS	ETX
	Command Packet	05h	SYS ID	HOST ID	90h	04h	TD1-TDN	CS	06h
	Ack Packet	05h	HOST ID	SYS ID	94h	04h	RD1-RDN	CS	06h
	Parameter	TD1: BaudRate and Block Size							
		BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
		Block Size				BaudRate			
		-128bytes: 20h				- Regardless of value, 9600bps			
		TD2-TD3: Target							
		- Laser: 40h							
		TD4: Model							
		- VM Series 80h							
RD1: Update Status									
-FW_APP_START_OK: 00h									
-FW_APP_START_FAIL: 01h									
-FW_BL_START_OK: 02h									
-FW_BL_START_FAIL: 03h									
-FW_BL_UP_DATA_OK: 04h									
-FW_BL_UP_DATA_FAIL: 05h									
-FW_BL_UP_DATA_REBOOT_FAIL: 06h									
-FW_BL_FINISH_OK: 07h									
-FW_BL_FINISH_FAIL: 08h									
-FW_BL_FINISH_REBOOT_FAIL: 09h									
-FW_BL_UP_DATA_TIME_OUT: 0Ah									
-FW_BL_UP_CHECKSUM_ERROR: 0Bh									
-FW_BL_VERIFY_DATA_OK: 0Ch									
-FW_BL_VERIFY_DATA_FAIL: 0Dh									
RD2: Current FW Version(VersionH)									
RD3: Current FW Version(VersionL)									
RD4: 00h									
	비고								

No	Function	FW_BL_UPDATE_START							
4	Remark	1) Erase flash command							
	Byte	1	2	3	4	5	6~N	N+1	N+2
		STX	ID		CMD	SIZE	DATA	CS	ETX
	Command Packet	05h	SYS ID	HOST ID	91h	04h	TD1-TDN	CS	06h
	Ack Packet	05h	HOST ID	SYS ID	94h	05h	RD1-RDN	CS	06h
	Parameter	TD1: Currebt update target - Laser: 07h TD2: FW page size(File size / Block size) low byte TD3: FW page size(File size / Block size) high byte TD4: Model - VM Series 80h RD1: Update Status -FW_APP_START_OK: 00h -FW_APP_START_FAIL: 01h -FW_BL_START_OK: 02h -FW_BL_START_FAIL: 03h -FW_BL_UP_DATA_OK: 04h -FW_BL_UP_DATA_FAIL: 05h -FW_BL_UP_DATA_REBOOT_FAIL: 06h -FW_BL_FINISH_OK: 07h -FW_BL_FINISH_FAIL: 08h -FW_BL_FINISH_REBOOT_FAIL: 09h -FW_BL_UP_DATA_TIME_OUT: 0Ah -FW_BL_UP_CHECKSUM_ERROR: 0Bh -FW_BL_VERIFY_DATA_OK: 0Ch -FW_BL_VERIFY_DATA_FAIL: 0Dh RD2: Currebt update target -Laser: 07h RD3: Current FW Version(VersionH) RD4: Current FW Version(VersionL) RD5: 0x00							
	비고								

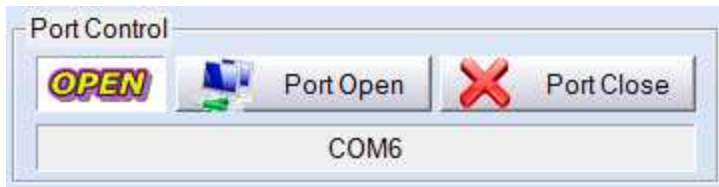
No	Function	SMC_FW_BL_SET_DATA							
5	Remark	1) Write data to flash command							
	Byte	1	2	3	4	5	6~N	N+1	N+2
		STX	ID		CMD	SIZE	DATA	CS	ETX
	Command Packet	05h	SYS ID	HOST ID	92h	82h(130)	TD1-TDN	CS	06h
	Ack Packet	05h	HOST ID	SYS ID	94h	03h	RD1-RDN	CS	06h
	Parameter	TD1: FW current page number low byte TD2: FW current page number high byte TD3-TD130: FW data 128bytes RD1: Update Status -FW_APP_START_OK: 00h -FW_APP_START_FAIL: 01h -FW_BL_START_OK: 02h -FW_BL_START_FAIL: 03h -FW_BL_UP_DATA_OK: 04h -FW_BL_UP_DATA_FAIL: 05h -FW_BL_UP_DATA_REBOOT_FAIL: 06h -FW_BL_FINISH_OK: 07h -FW_BL_FINISH_FAIL: 08h -FW_BL_FINISH_REBOOT_FAIL: 09h -FW_BL_UP_DATA_TIME_OUT: 0Ah -FW_BL_UP_CHECKSUM_ERROR: 0Bh -FW_BL_VERIFY_DATA_OK: 0Ch -FW_BL_VERIFY_DATA_FAIL: 0Dh RD2: FW current page number low byte RD3: FW current page number high byte							
	Remark								

No	Function	FW_BL_UPDATE_FINISH							
6	Remark	1) Write data to flash command							
	Byte	1	2	3	4	5	6~N	N+1	N+2
		STX	ID		CMD	SIZE	DATA	CS	ETX
	Command Packet	05h	SYS ID	HOST ID	93h	00h	-	CS	06h
	Ack Packet	05h	HOST ID	SYS ID	94h	03h	RD1-RDN	CS	06h
	Parameter	RD1: Update Status -FW_APP_START_OK: 00h -FW_APP_START_FAIL: 01h -FW_BL_START_OK: 02h -FW_BL_START_FAIL: 03h -FW_BL_UP_DATA_OK: 04h -FW_BL_UP_DATA_FAIL: 05h -FW_BL_UP_DATA_REBOOT_FAIL: 06h -FW_BL_FINISH_OK: 07h -FW_BL_FINISH_FAIL: 08h -FW_BL_FINISH_REBOOT_FAIL: 09h -FW_BL_UP_DATA_TIME_OUT: 0Ah -FW_BL_UP_CHECKSUM_ERROR: 0Bh -FW_BL_VERIFY_DATA_OK: 0Ch -FW_BL_VERIFY_DATA_FAIL: 0Dh RD2: FFh RD3: FFh							
	Remark								

5. VM Control Program



5.1 Port Control

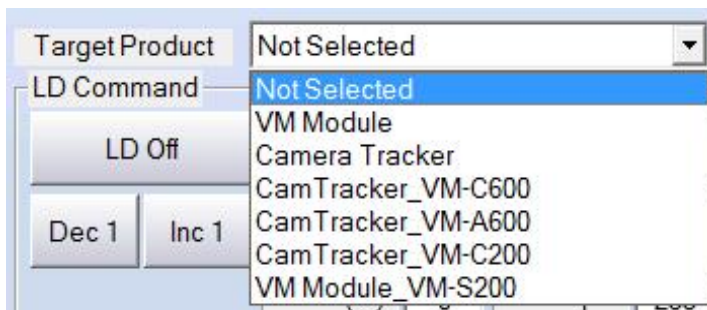


Command group to which the communication port control

- Open: Open the communication port
- Close: Close the communication port
- Message Box: Show the port number that is currently being used

5.2 Target Product

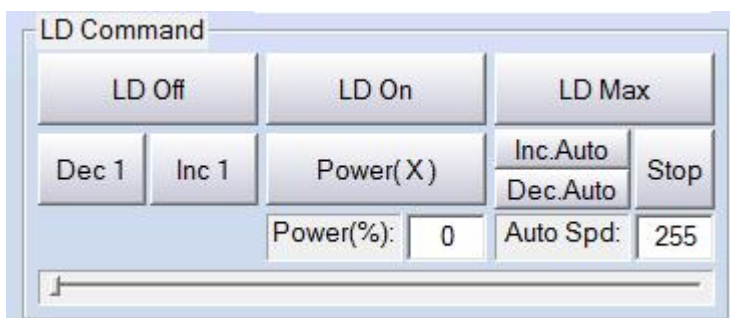
Choose the affected product among products group



Change the range of step motor as select

5.3 LD Command

Command group to which the output power of laser diode control



- LD Off: Off the power of laser diode. Shut off automatically if the set power is 0%
 - LD On: On the power of laser diode. Shut on automatically if the set power is over 1%
 - LD Max: Set the maximum output power of laser diode
 - Dec 1: Decrease 1% of current output power
 - Inc 1: Increase 1% of current output power
 - Power(X): Control any power.
- The output power can be set if user input the value in the box of Power(%) or use slider control bar.

Need to click the button after input the value.

- Inc. Auto: Gradually increase the output power of laser to 100%

User can input the value from 0 to 255 user want in the box of 'Auto Spd:

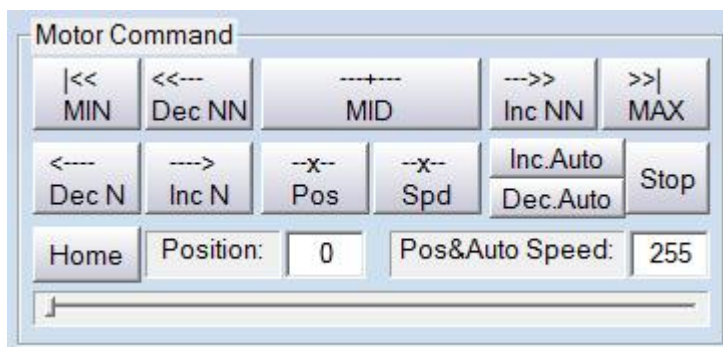
- Dec. Auto: Gradually decrease the output power of laser to 0%

User can input the value from 0 to 255 user want in the box of 'Auto Spd:

- Stop: Stop the changing output power when the laser power are changing by command of 'Inc. Auto' or 'Dec. Auto'

5.4 Motor Command

Command group to which the beam angle control



- MIN: Move to the minimum step position
- Dec NN: Move the 250 step to minimum step position
- MID: Move to the middle step position
- Inc NN: Move the 250 step to maximum step position
- MAX: Move the maximum step position
- Dec N: Move the 25 step to minimum step position
- Inc N: Move the 25 step to maximum step position
- Pos: Move any position

User can set the step position value if user input the value in the box of Position or use slider control bar.

Control automatically the step range as the choice of target product. (ex: VM-P6000=4500, VM-S200=3300)

- Spd: Move to any position

User can set the speed value from 0 to 255 if use input the value in the box of Pos&Auto Speed

5.5 FAN Command

Command group to which the heat sinking fan control

FAN Control

Select Mode: 0:OFF FAN Opr. Mode

ROM[°C] 30 Set Get Cur [°C]: Cur.

- Cur.: Show the current temperature value from the temperature sensor
(Show the value after division 100)

5.6 System Command

Command group of system

System Command

Power [%]	----	Status
Motor [Step]	----	
Version [M.m]	----	
----		FW Upd...

- Status: Can check the current output power and motor step value
Can also check the value when the power is changing or Motor is moving
- Version: Can check the current firmware version
- FW Upd...: The command is that new firmware update in inside flash memory.

5.7 Log Window

Window to which communication frame show

Clear

```

0031 Tx: 05 00 00 E1 01 01 1C 06
0032 Rx: 05 00 00 E1 06 01 00 00 1A 00 FF FE 06
0033 Tx: 05 00 00 E1 01 01 1C 06
0034 Rx: 05 00 00 E1 06 01 00 00 1A 00 FF FE 06
0035 Tx: 05 00 00 E1 01 01 1C 06
0036 Rx: 05 00 00 E1 06 01 00 00 1A 00 FF FE 06
0037 Tx: 05 00 00 E1 01 01 1C 06
0038 Rx: 05 00 00 E1 06 01 00 00 1A 00 FF FE 06
0039 Tx: 05 00 00 E0 01 35 E9 06
0040 Rx: 05 00 00 E0 01 35 E9 06
0041 Tx: 05 00 00 E1 01 01 1C 06
0042 Rx: 05 00 00 E1 06 01 00 00 14 01 FF 03 06
0043 Tx: 05 00 00 E0 01 33 EB 06
0044 Rx: 05 00 00 E0 01 33 EB 06
0045 Tx: 05 00 00 E0 01 35 E9 06
0046 Rx: 05 00 00 E0 01 35 E9 06
0047 Tx: 05 00 00 E1 01 01 1C 06
0048 Rx: 05 00 00 E1 06 01 00 00 FA 00 FF 1E 06
0049 Tx: 05 00 00 E1 01 01 1C 06
0050 Rx: 05 00 00 E1 06 01 00 00 FA 00 FF 1E 06
  
```

- Clear: Initialize the frame serial number after delete all displayed contents
- XXXX (4 Digit): The serial number of frame
- TX: Show the transmitted frame from window program to the illuminator
- RX: Show the transmitted frame from the illuminator to the window program

- Data: Show the frame information to Hexadecimal notation in bytes
Please refer to the protocol manual if you want the details

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