

測試指令列表 – WebApi (前端 → 後端)

功能	Method	URL	Body	預期回應 (JSON 範例)
開始檢測	POST	http://localhost:5000/api/start	無	{ "status": "ok", "message": "Inspection started successfully" }
停止檢測	POST	http://localhost:5000/api/stop	無	{ "status": "ok", "message": "Inspection stopped successfully" }
單次觸發	POST	http://localhost:5000/api/trigger_once	無	{ "status": "ok", "message": "Single trigger executed (ID=HHmmssfff)" }
開始迴圈檢測	POST	http://localhost:5000/api/loop_start	無	{ "status": "ok", "message": "Loop inspection started" }
停止迴圈檢測	POST	http://localhost:5000/api/loop_stop	無	{ "status": "ok", "message": "Loop inspection stopped" }
查詢狀態	GET	http://localhost:5000/api/status	無	json { "status": "ok", "curStatus": { "model": "ModelA", "wafer_id": "W12345", "status": "Processing", "total_steps": 120, "system": "Pass", "card": "Pass", "camera": "Fail", "light": "None", "process": "Pass" } }
未知路徑測試	POST	http://localhost:5000/api/foobar	無	404 + { "status": "error", "message": "Unknown API path" }

狀態欄位對照表

功能	Method	URL	Body	預期回應 (JSON 範例)
查詢狀態	GET	http://localhost:5000/api/status	無	<pre>json { "status": "ok", "curStatus": { "model": "ModelA", "wafer_id": "W12345", "status": "Processing", "total_steps": 120, "system": "Pass", "card": "Pass", "camera": "Fail", "light": "None", "process": "Pass" } }</pre>

ProcStatus (流程狀態)

- Idle → 系統閒置，等待開始命令
- AwaitingTrigger → 等待外部觸發信號
- CapturingImage → 從設備擷取影像
- Processing → 執行演算法 / 處理資料
- SavingImage → 儲存影像

ModuleStatus (模組狀態)

- None → 尚未檢測或無狀態
- Pass → 模組檢測通過
- Fail → 模組檢測失敗

curStatus JSON 欄位

- model → 當前檢測的模型名稱 (CurModel)
- wafer_id → 當前 wafer ID (CurId)
- status → 流程狀態 (M_ProcStatus)
- total_steps → 總步數 (CurTotalSteps)
- system → 系統模組狀態 (M_SystemStatus)
- card → 卡片模組狀態 (M_CardStatus)
- camera → 相機模組狀態 (M_CameraStatus)
- light → 光源模組狀態 (M_LightStatus)
- process → 處理模組狀態 (M_ProcessStatus)

Function → JSON 範例對照表 – WebSocket (後端 -> 前端)

Function 名稱	command 值	JSON 範例
SendInspectStart()	"INSPECT_START"	json { "command": "INSPECT_START", "model": "ModelA", "wafer_id": "W12345", "status": "Processing", "total_steps": 120, "start_time": "2026/02/05 19:25:30" }
SendStatus()	"STATUS"	json { "command": "STATUS", "status": "Idle" }
SendCaptureIndex(int)	"CAPTURE_INDEX"	json { "command": "CAPTURE_INDEX", "index": 5, "total_steps": 120 }
SendCaptureTimeSpent(double)	"CAPTURE_TIME_SPENT"	json { "command": "CAPTURE_TIME_SPENT", "capture_time_spent": 3 }
SendFusingIndex(int, int)	"FUSING_INDEX"	json { "command": "FUSING_INDEX", "index": 2, "total_steps": 120 }
SendFusingTimeSpent(double)	"FUSING_TIME_SPENT"	json { "command": "FUSING_TIME_SPENT", "fusing_time_spent": 7 }
SendFinished(double, string)	"FINISHED"	json { "command": "FINISHED", "total_time_spent": 25, "storage_path": "C:\\\\Results\\\\image001.png" }
SendError(string)	"ERROR"	json { "command": "ERROR", "error_message": "Camera disconnected" }

各 function 的 JSON 範例

SendInspectStart()

```
{
  "command": "INSPECT_START",
  "model": "ModelA",
  "wafer_id": "W12345",
  "status": "Processing",
  "total_steps": 120,
  "start_time": "2026/02/05 19:25:30"
}
```

SendStatus()

```
{
  "command": "STATUS",
  "status": "Idle"
}
```

SendCaptureIndex(int captureIndex)

```
{
  "command": "CAPTURE_INDEX",
  "index": 5,
  "total_steps": 120
}
```

SendCaptureTimeSpent(double captureTime)

```
{
  "command": "CAPTURE_TIME_SPENT",
  "capture_time_spent": 3
}
```

SendFusingIndex(int fusingIndex, int totalSteps)

```
{
  "command": "FUSING_INDEX",
  "index": 2,
  "total_steps": 120
}
```

SendFusingTimeSpent(double fusingTime)

```
{
  "command": "FUSING_TIME_SPENT",
  "fusing_time_spent": 7
}
```

SendFinished(double totalTime, string filePath)

```
{
  "command": "FINISHED",
  "total_time_spent": 25,
  "storage_path": "C:\\Results\\image001.png"
}
```

SendError(string errorMessage)

```
{
  "command": "ERROR",
  "error_message": "Camera disconnected"
}
```