SIRIUS2

PROTOCOL for REMOTE COMMUNICATION

Revision History

2023.10.18 Initial version (v.1.5.830)

2023.10.19 added) layer, select, deselect (v.1.6.840)

2023.11.23 fixed) rename name as control to marker (v.1.11.920)

2023.12.11 removed) Status,End (v.1.13.965)

2024.03.15 Draft version (v.1.21.1120)

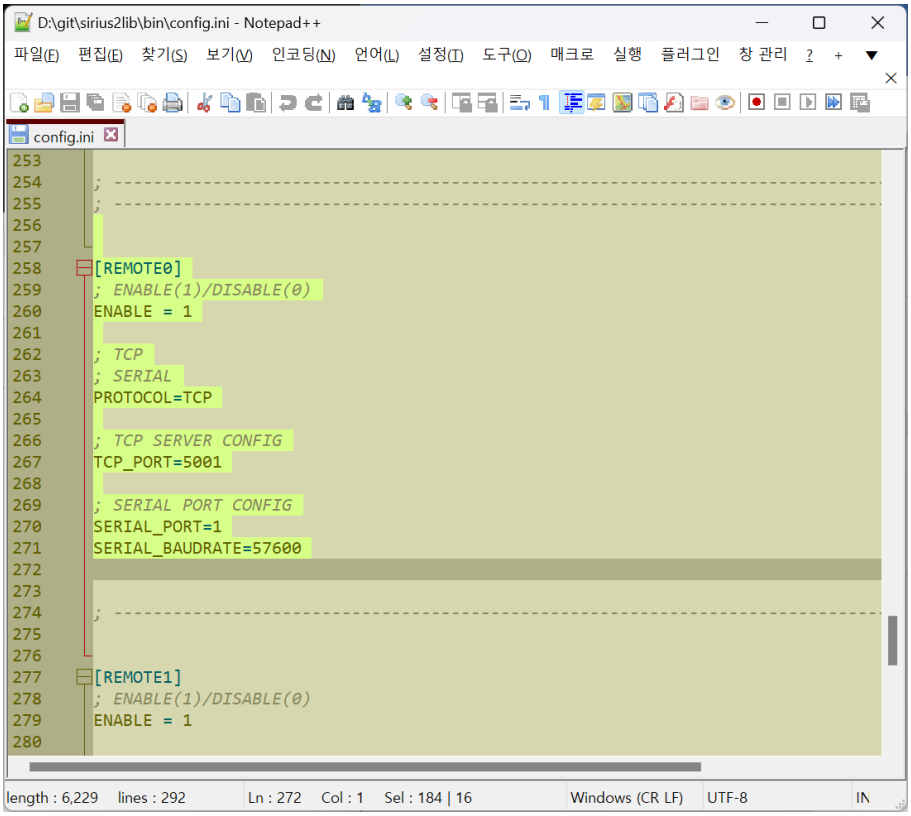
2024.03.21 added) script (v.1.22.1140)

2024.07.8 added) power (v.1.39.1600)

1. Communication Methods: TCP/IP Server or SERIAL(RS-232)

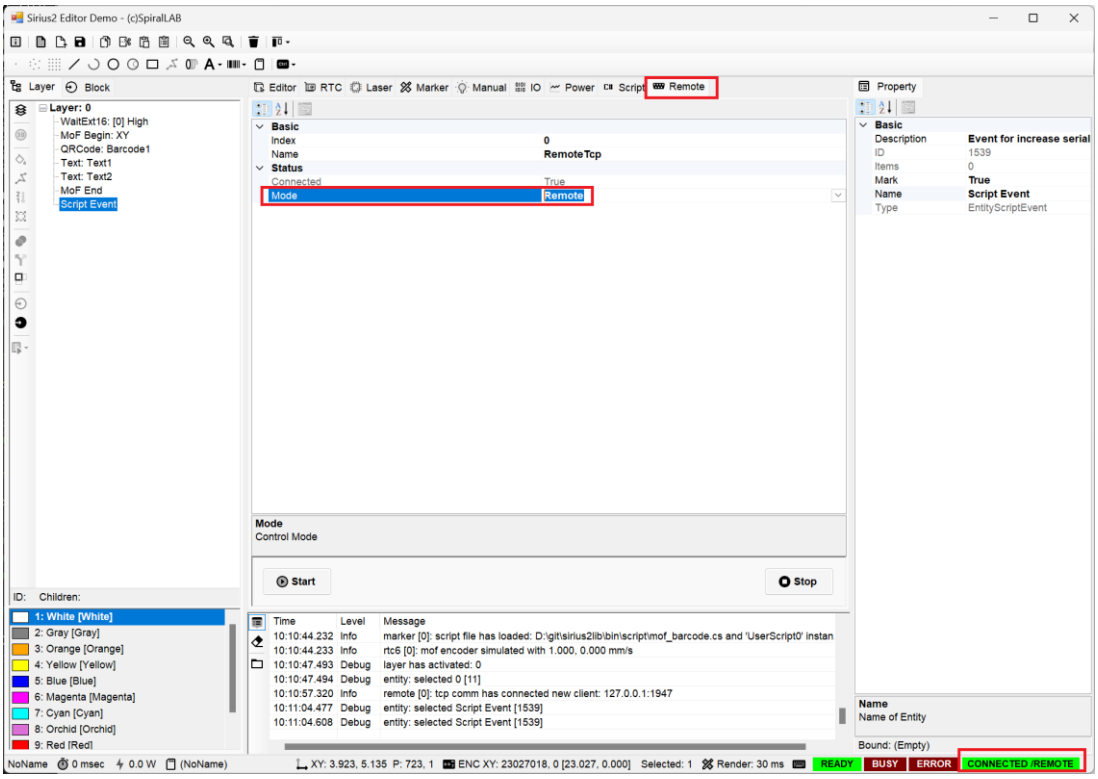
- For TCP/IP
  - Server Port: 50001
- For Serial (RS-232)
  - COM Port: 1
  - Baud-rate: 57600 bps
  - Data bit: 8
  - Stop bit: 1
  - Parity: None
- Communication format are based on ASCII character
- Default separator: ‘,’
- Default terminator: ’;’
- Configurable setting at config.ini file

```
[REMOTE0]
; 1= ENABLE, 0= DISABLE
ENABLE=1
; TCP, SERIAL
PROTOCOL=TCP
; TCP config
TCP_PORT=5001
; SERIAL config
SERIAL_PORT=2
SERIAL_BAUDRATE=57600
```



2. List of commands

- Recipe: Query and change recipe file
- Offset: Update list of marker offsets (dx,dy,dz,angle z, …)
- Marker: Marker commands
- Status: Marker status
- Power: Power mapping, compensate, verify commands
- Entity: Query and update entity’s property value
- Pen: Query and update pen’s property value
- Layer: Query and update layer’s property value
- Script: Query and update script’s property value
- Select or Deselect: Query and select/deselect entities
- FieldCorrection: Popup scanner field correction 2D winforms



(Warning) User must switch mode as ‘remote’ to control by remotely

3. Recipe

- Command: Recipe, Filename; (absolute path)
- Example: Recipe,C:\sirius2\bin\recipe\test.sirius2;
- Response: OK; or NG;

- Command: Recipe, Filename; (relative path at \recipe\)
- Example: Recipe,test.sirius2; (searching for \recipe)
- Response: OK; or NG;

- Query: Recipe;
- Response: OK;Recipe,C:\sirius2\bin\recipe\test.sirius2;

4. Marker offsets

- Command: Offset,Count,x_1,y_1,z_1,angle$_1$, … , x_n,y_n,z_n,angle$_n$;
- Example: Offset,1,-5,1,0,2;

- Example: Offset,2,-5,0,0,0, 5,0,0,0;
- Response: OK; or NG;
- (Ref1) Transformation orders are rotate z and translate dx,dy,dz

5. Marker command

- Command: Marker,Start (|Stop|Reset);
- Example: Marker,Start;
- Example: Marker,Stop;
- Example: Marker,Reset;
- Response: OK; or NG;

6. Marker status

- Query: Status;
- Response: Status,Error; (|Status,Busy;|Status,Ready;|Status,NotReady;)
- Auto Response: Status,Started; (|Status,Ended;)

7. Power

- Command: Power,Map (|Compensate|Verify);
- Example: Power,Map;
- Example: Power,Compensate;
- Example: Power,Verify;
- Response: OK; or NG;

8. Entity

- Query lists of entity properties
- Format: Entity, Name, Properties;
- Example: Entity,Rectangle1,Properties;
- Response:

```
OK;
Width,10;
Height,5;
IsClosed,True;
IsHatchable,False;
HatchMode,Line;
HatchJoint,Square;
IsHatchZigZag,False;
HatchAngle,90;
HatchAngle2,0;
HatchInterval,0.2;
HatchExclude,0.05;
HatchShift,0;
HatchRepeat,1;
IsHatchIncludeOutline,True;
IsHatchOutlineFirst,False;
Id,1260;
TypeName,EntityRectangle;
Color,Color [White];
Name,Rectangle;
IsRenderable,True;
IsMarkerable,True;
IsHitTestable,True;
IsSelected,True;
ChildCount,0;
Alignment,None;
ModelAlign,(0, 0, 0);
ModelTranslate,(10, -10, 0);
ModelScale,1;
ModelRotate,(0, 0, 0);
Repeats,1;
In,(5, -7.5, 0);
Out,(5, -7.5, 0);
BBox,10.000, 5.000, 0.000;
ModelMatrix,(1, 0, 0, 0)
(0, 1, 0, 0)
(0, 0, 1, 0)
(10, -10, 0, 1);
```

- Query property value of entity
- Format: Entity, Name, Property;
- Example: Entity,Rectangle1,Color;
- Response: OK;Entity,Rectangle1,Color,White;

- Example: Entity,Rectangle1,Width;
- Response: OK;Entity,Rectangle1,Width,10;

- Example: Entity,Rectangle1,ModelTranslate;

- Response: OK;Entity,Rectangle1,ModelTranslate,10,-10,0;

- Command to set property value of entity
- Format: Entity, Name, Property, Value;
- Example: Entity,Rectangle1,Color,Yellow;
- Response: OK; or NG;

- Example: Entity,Rectangle1,Width,11;
- Response: OK; or NG;

- Example: Entity,Rectangle1,ModelTranslate,0,0,0;
- Response: OK; or NG;

9. Pen

- Query lists of pen properties
- Format: Pen, Name, Properties;
- Example: Pen,White,Properties;
- Response:
  OK;
  Power,1;
  PowerMax,10;
  PowerPercentage,10;
  Frequency,50000;
  PulseWidth,2;
  PulsePeriod,20;
  PulsePitch,2;
  PulseDutyCycle,10.000 %;
  JumpSpeed,100;
  MarkSpeed,100;
  MinMarkSpeed,0;
  ApproxBlendLimit,0;
  Color,Color [White];
  LaserFpk,0;
  LaserQSwitchDelay,0;
  LaserOnDelay,10;
  LaserOffDelay,50;
  ScannerJumpDelay,250;
  ScannerMarkDelay,150;
  ScannerPolygonDelay,0;
  IsScannerVariablePolygonDelay,False;
  ScannerVariablePolygonDelayEdgeLevel,0;
  IsScannerVariableJumpDelay,False;
  ScannerVariableJumpDelayMin,50;
  ScannerVariableJumpLength,1;
  IsSkyWritingEnabled,False;
  SkyWritingMode,Mode3;
  LaserOnShift,10;
  TimeLag,150;

Prev,0;
Post,0;
AngularLimit,89;
IsWobbelEnabled,False;
WobbelPerpendicular,0;
WobbelParallel,0;
WobbelFrequency,0;
WobbelShape,Ellipse;
Id,1;
TypeName,EntityPen;
Name,White;
Description,Color [White];
ChildCount,0;

- Query property value of pen
- Format: Pen, Name, Property;
- Example: Pen,White,MarkSpeed;
- Response: OK;Pen,White,MarkSpeed,100;

- Query: Pen,White,Frequency;
- Response: OK;Pen,White,Frequency,50000;

- Command to set property value of pen
- Format: Pen, Name, Property, Value;
- Example: Pen,White,MarkSpeed,1000;
- Response: OK; or NG;

- Command: Pen,White,Frequency,100000;
- Response: OK; or NG;

10. Layer

- Query lists of layer properties
- Format: Layer, Name, Properties;
- Example: Layer,0,Properties;
- Response:
OK; MotionType,StageAndScanner;
BandWidth,2;
IsALC,False;
AlcSignal,Disabled;
AlcMode,Disabled;
AlcPercentage100,0;
AlcMinValue,0;
AlcMaxValue,0;
AlcByPositionTable,System.Collections.Generic.KeyValuePair`2[System.Double,System.Double][];
Id,11;
TypeName,EntityLayer;

Name,0;
IsRenderable,True;
IsMarkerable,True;
IsSelected,True;
ChildCount,0;
Repeats,1;
In,(0, 0, 0);
Out,(0, 0, 0);

- Query property value of layer
- Format: Layer, 0, Property;
- Example: Layer,0,Name;
- Response: OK;Layer,0,Name,0;

10. Script

- Query lists of script properties
- Format: Script, Properties;
- Example: Script,Properties;
- Response:
OK;StartSerialNo,1;MaxSerialNo,10;SerialNo,1;Name,mof_barcode.cs;Description,incremented serial no;

- Query property value of script
- Format: Script, Name;
- Example: Script,StartSerialNo;
- Response: OK;Script,StartSerialNo,1;

- Command to set property value of entity
- Format: Script, Name, Value;
- Example: Script,StartSerialNo,100;
- Response: OK; or NG;

11. Select or Deselect

- Query lists of selected entities
- Example: Select;
- Response:OK;Select,1,Arc1; (if 1 entity has select)
- Response:OK;Select,0; (if nothing has selected)

- Format: Select,Count,Name1,Name2,…;
- Example: Select,1,Arc1;
- Response: OK; or NG;

- Example: Select,2,Arc1,Arc2;
- Response: OK; or NG;

12. Field Correction 2D

- Command: FieldCorrection, Rows, Cols, Interval, ErrX1,ErrY1, ErrX2,ErrY2, …, , ErrXn,ErrYn;
- Example: FieldCorrection,3,3,10,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0;
- Response: OK; or NG;
- (Ref1) Row and Col are odd numbers only (3,5,7,9, …)
- (Ref2) ErrX, ErrY values are order from left top to right bottom

13. Example

- Command: Recipe,test.sirius2;
- Response: OK;
- Command: Entity,QRCode1,SourceText,HELLO WORLD;
- Response: OK;
- Query: Status;
- Response: Status,Ready;
- Command: Marker,Start;
- Response: OK;
- Auto Response: Marker,Started;
- Query: Status;
- Response: Status,Busy;
  …
- Auto Response: Status,Ended;
- Query: Status;
- Response: Status,Ready;
- Command: Offset,2, -5,0,0,0, 5,0,0,0;
- Response: OK;

- Command: Marker,Start;
- Response: OK;
- Auto Response: Marker,Started;
- …
- Auto Response: Status,Ended;

부록. 사용자 정의 프로토콜 구현 방법

내장된 원격통신(IRemote) 객체의 기능을 변경하고자 한다면 아래의 방법들 중에 적절한 방법을 사용해 직접 통신관련 사항을 구현해야 합니다.

(방법1) 수신 데이터를 처리하는 ProcessFormat 함수의 기능을 변경

1. ProcessFormat 함수를 상속받아 오버라이드(override) 하는것도 가능하며 아래와 같이 수신 OnReceived 이벤트 핸들러를 통해 기능 변경도 가능합니다.
2. 구분자(Config.RemoteSeparator) 및 종결자(Config.RemoteTerminator) 재 설정 가능

```
remote.OnReceived += Remote_OnReceived;
...
bool Remote_OnReceived(IRemote remote, string data)
{
    var marker = remote.Marker;
    var doc = marker.Document;
    var view = marker.View;
    var rtc = marker.Rtc;
    var laser = marker.Laser;
    var powerMeter = marker.PowerMeter;
    var mainForm = EditorControl;
    if (marker.IsBusy)
    {
        remote.Send($"{Config.RemoteNG}{Config.RemoteTerminator}");
        return false;
    }
    char[] seps = { Config.RemoteSeparator };
    bool success = true;
    string[] tokens = data.Split(seps);
    switch (tokens[0].ToLower())
    {
        case "recipe":
            if (tokens.Length >= 2)
            {
                // Change recipe file
                var fileName = Path.Combine(Config.RecipePath, tokens[1]);
                mainForm.Invoke(new MethodInvoker(delegate ()
                {
                    success &= doc.ActOpen(fileName);
                    if (success)
                        success &= marker.Ready(doc);
                }));
                if (success)
                    remote.Send($"{Config.RemoteOk}{Config.RemoteTerminator}");
                else
                    remote.Send($"{Config.RemoteNG}{Config.RemoteTerminator}");
            }
            else
            {
               // Query recipe file
                remote.Send($"{Config.RemoteOk}{Config.RemoteTerminator}");
                remote.Send($"Recipe{Config.RemoteSeparator}{doc.FileName}
{Config.RemoteTerminator}");
            }
            break;
```

```
        ...
    }
    return success;
}
```

(방법2) RemoteBase 클래스로부터 상속 및 사용자 구현

1. Start, Stop, Send, Receive 등의 가상 함수들에 대해서 사용자 구현
2. 구분자(Config.RemoteSeparator) 및 종결자(Config.RemoteTerminator) 재 설정 가능
3. ProcessFormat 함수를 오버라이딩(override) 혹은 OnReceived 이벤트 핸들러를 등록하여 사용자 구현 가능

```
public class MyRemote
    : RemoteBase
{
    …
}
```

(방법3) IRemote 인터페이스 상속 및 사용자 구현

1. IRemote 인터페이스를 유지한 채 모든 기능을 사용자가 직접 구현
2. 구분자(Config.RemoteSeparator) 및 종결자(Config.RemoteTerminator) 재 설정 가능

```
public class MyRemote : IRemote
{
    …
}
```