SIRAM

SIRAM Protocol

WPS

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INDICE

1. INTRODUCTION

The integration protocol between the License Plate Recognition System Siram and the automated management parking system from WPS has been defined thinking in the following aspects:

- The LPR system should not interference in the parking management system.

- The Siram LPR becomes one more peripheral of the system likes the tickets or card readers. Due that, the interface has been designed as a simple way to control the LPR device.

- The communications between both systems are done through TCP/IP sockets, being the application from WPS the “client” and SIRAM the “server”.

- The external application is which detects the presence of the vehicle and sends a signal to SIRAM to initiate the OCR and responds with the result.

2. ELEMENTS OF THE SYSTEM

The system has been designed following a modular and scalable architecture so as to provide a versatile, distributed and robust application. The complete system is made up of following elements:

CAPTURE UNIT. (UICAP- IP). The capture unit is the set of elements which take photographs of the license plate to be recognised.

OCR SOFTWARE. *(*SIRAM OCR – *SiramParkWPS00N.exe).* This is the software with which the automatic recognizion of the license plates for each capture unit is made. Up to ten SIRAM OCR can be installed in a single PC, from a SIRAM1.exe to a SIRAM10.exe, as long as the PC has the minimum requirements to run them. As it is a distributed application, it is also possible to install various OCRs in different PCs so that the process load can be distributed among different machines.

TEST OCR SOFTWARE. *(SIRAM OCR - SiramParkWPS00N.exe).* This is the simulator software that allow to hold the protolcol integration tests. This suite has a licensed picture collection installed in the hard disk of the PC, and are used by the OCR to do the plate recognition process instead of take the picture from the camera.

3. PROTOCOL

3.1. TYPES OF MESSAGES

Each capture unit has one exe file associated (Siram1.exe,..., SiramN.exe) that has a TCP/IP server which uses sockets to communicate with the management parking software. The TCP/IP server can use permanent or temporal connections, being possible to open a new connection for each new command that has sent.

If a new connection is done for every message, Siram can be set up to close automatically the connection once the answer to the requested command has been sent.

The external application connects to each SIRAM N like a TCP/IP client using different ports which are configurable in the ini file.

The commands that are included in this version of the protocol are the following:

Message	Sense	Description
LPR	→	Plate Request.
LPR-RESULT	←	Answer to the plate request.
STATUS	→	Status request to SIRAM.
STATUS-RESULT	←	Answer to the Status request to SIRAM.
KEEP-ALIVE	→	Query of the status of the TCP/IP connection in the case that a permanent socket has been used.
KEEP-ALIVE-RESPONSE	←	Answer to the KEEP-ALIVE command.
OCR-VERSION	→	Query of the SiramN.exe version.
OCR-VERSION-RESULT	←	Answer to the executable version query.
TICKET	→	Sending of the ticket number to SIRAM.
TICKET-RESULT	←	Acknowledgment to the ticket reception.
QUIT	←	Disconnect

3.2. DETAIL OF THE MESSAGES

The messages have a character like an indicator of the beginning of the message, some delimited fields which uses a character like a delimiter, and a character like an indicator of the end of the message.

These are the control characters:

‘[‘ → Beginning of the message

‘]’ → End of the message

‘;’ → Field separator character

If one field is not mandatory the field would be empty, although its delimiter character always must exists.

Then we will discuss the details of each of the messages that incorporate this protocol:

[lpr;CameraID;TransactionID;SecurityCode]

Field	Field description
Lpr	Plate request command
CameraID	Identifier of the camera associated to the lane or the terminal.
TransactionID	Identifier of the transaction. It is used to Exchange messages in an asynchronous way
SecurityCode	The security code is: 1090F

Example:

```
[lpr;1;1;1090F]
```

[lpr-result;CameraID;TransactionID;Error_Code;Plate_Number;Date;Time;

Picture_Type;Picture_Length](Picture)

Field	Field Description
lpr-result	Answer to the plate request command
CameraID	Identifier of the camera associated to the lane or the terminal.
TransactionID	Identifier of the transaction. It is used to Exchange messages in an asynchronous way
Error_Code	Type or Error. In this version 0. No error 1. General Error
Plate_Number	Plate Number (no spaces or dashes)
Date	Date in the format YYYYMMDD
Time	Time in the format HHMMSS
Picture_Type	Type of the picture. In this version 0. No Picture 1. JPEG
Picture_Length	Size of the picture (in bytes)
Picture	Picture in a binary raw data format, it is provided at the end of the message, out of the brackets

Example:

```
[lpr-result;1;1;0;KNT7749;20121212;120509;1;23456](Binary raw data)
```

If there is no plate, the plate field is empty

Example:

```
[lpr-result;1;1;0;;20121212;120509;1;23456](Binary raw data)
```

If there is no communication with the camera, the answer is with the corresponding error code (actually this error code is 1), picture type zero, and the jpeg size with zero value too.

```
[lpr;1;TR1;1;;20121212;120509;0;0]
```

[status;Camera ID]

Field	Field Description
status	Status request command
CameraID	Identifier of the camera associated to the lane or the terminal.

Example:

```
[Status;1]
```

[status-result;Camera ID;status_code]

Field	Field Description
Status-result	Answer to the status request command
CameraID	Identifier of the camera associated to the lane or the terminal.
Status_code	Identifier of the OCR status 0. OCR in standby 1. OCR working 2. General Error

Example:

```
[Status-result;1;0]
```

[keep-alive;Camera ID]

Field	Field Description
Keep-alive	Query of the status of the TCP/IP connection in the case that a permanent socket has been used.
CameraID	Identifier of the camera associated to the lane or the terminal.

Example:

```
[keep-alive;1]
```

[keep-alive-response;Camera ID]

Campo	Description del campo
keep-alive-response	Answer to the Query of the status of the TCP/IP connection command.
CameraID	Identifier of the camera associated to the lane or the terminal.

Example:

```
[keep-alive-response;1]
```

[ocr-version;Camera ID]

Campo	Description del campo
ocr-version	Query of the SiramN.exe version associated to the camera N.
CameraID	Identifier of the camera associated to the lane or the terminal.

Example:

```
[ocr-version;1]
```

[ocr-version-result;CameraID;Version_Number]

Campo	Description del campo
ocr-version-result	Answer to the Query of the SiramN.exe version associated to the cameraN command.
CameraID	Identifier of the camera associated to the lane or the terminal.
Version_Number	Version of the exe file

Example:

```
[ocr-version-result;1;3.5.5.26]
```

[ticket;TransactionID;Ticket_Number]

Field	Field Description
ticket	Command to send to Siram of the ticket number associated to a transaction.
TransactionID	Transatacion Identifier.
Ticket_Number	Ticket Number.

Example:

```
[ticket;1;024836210110110150457011 50]
```

[Quit]

Field	Field Description
QUIT	The server disconnect the client. This command is optional.

Example:

```
[quit]
```

4. CONFIGURATION FILE (SiramParkN.ini)

The configuration file has the same name that the excutable file, for example, the configuration file for the SiramParkWPS00N.exe must be named SiramParkWPS00N.ini.

The fields in this configuration file are the following:

```
##############################################
[SiramPark]
##############################################

## Camera Identifier.
CameraID=1

## Camera Model.
MODEL=AXIS 211
## IPAddress.
IP_CAM=192.168.0.91

## Pictures previous to trigger.
PRE=1
## Pictures after the trigger.
POST=1
## Angle correction Factor.
ANGLE=0
## Inclination corrección Factor.
SKEW=0
## Delay to start the OCR proccess (ms)
DELAY=0
## Save the OCR Picture in the HD.
SAVE_IMAGE=0

##  Enable the Setup configuration Menu.
CONFIG_ENABLED=1
## Enable the log file.
DEBUG=0

## PAIS LPR
PAIS_PRINCIPAL=BR

## Port through the external application connects with the OCR.
ListenPort=27001

## Send the picture (0:no, 1:yes)
SendBinaryData=0

## Close the socket connection with the client after each message (0:no,
1:yes)
CloseConnection=0

##############################################
[ControlSiram]
##############################################

## Communications port to connect with the ControlSiram.exe.
ControlSiram_PORT=22401
```

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