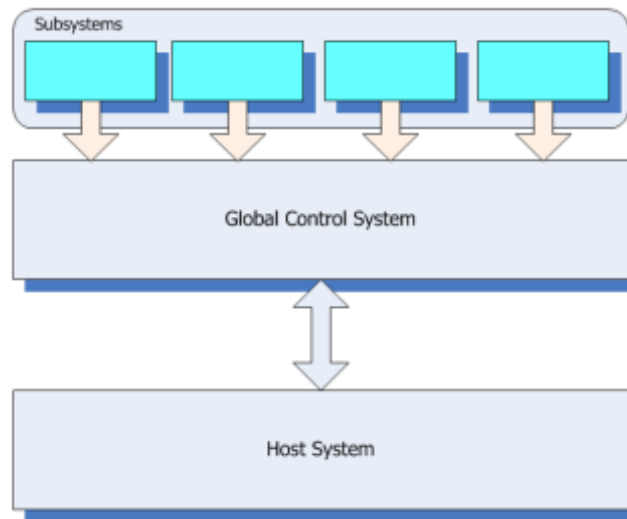


## Introduction

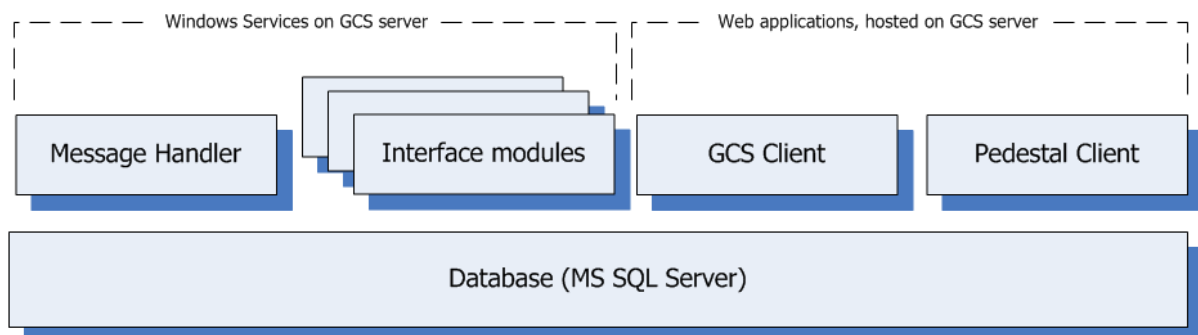
GCS is a software layer that is designed to operate as middleware between the various subsystems and a (terminal) host system.



Every subsystem has a specific task, like capturing OCR, handling Card Access Control, reading RFID tags, handling I/O signals etc. In the end the Host System, normally a TOS (Terminal Operating System) controls the flow of the area in which the subsystems operate. The Host System does not control the subsystems directly (its core function is to control the logistic operation), but it uses GCS to get input from and/or send output to the subsystems using a single channel to GCS only. The advantage is that the Host System does not have to deal with all the various interface technologies.

## GCS Architecture

GCS is developed as a modular application suite, with the following architecture:



A brief description of these building blocks:

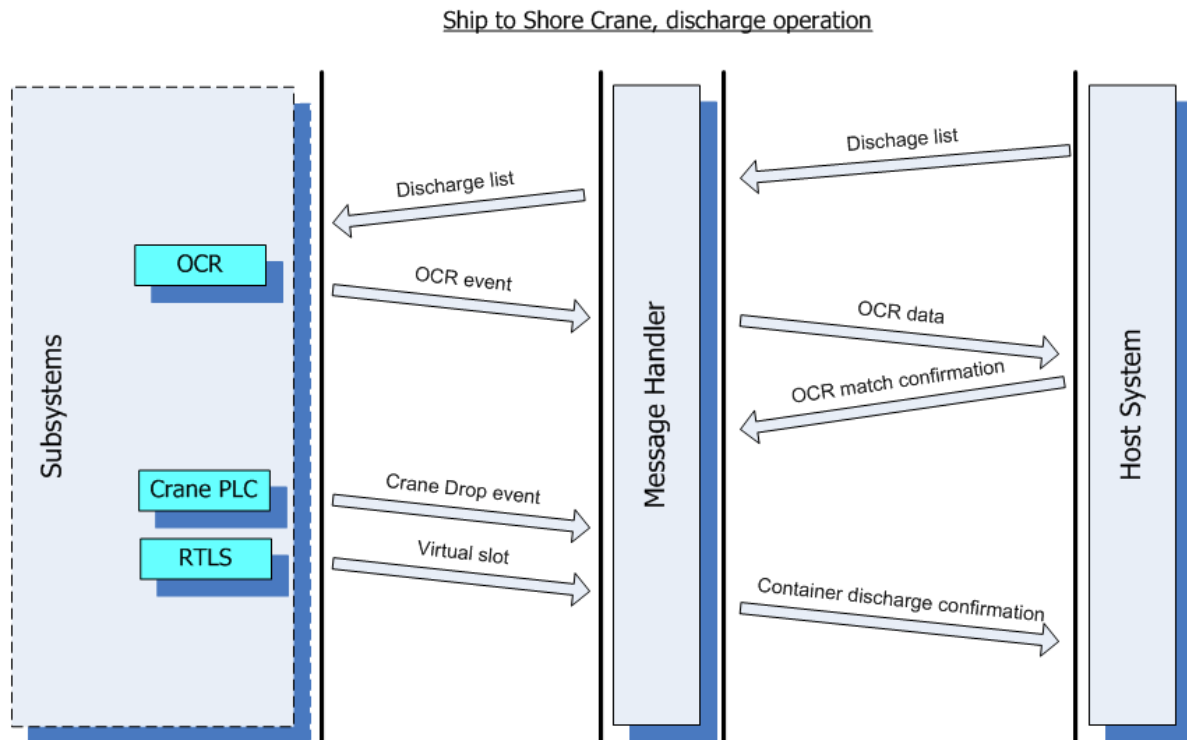
- All data is stored in a database, like messages, settings, authorization, statistics etc.
- The Message Handler is controlling all input and output from/to subsystems and Host System.
- The Interface modules are performing the dedicated tasks with subsystems and Host System.
- The GCS Client is the general user interface for controlling and managing GCS, it provides Exception handling, Manual interventions, OCR images etc.
- The Pedestal Client is the user interface for specific area's, like a Truck Gate display.

This architecture gives us the flexibility to realize any configuration with the existing building blocks, just by selecting the required modules.

## GCS Messaging

The Message Handler is a very important part of the GCS system. It will collect and distribute ALL data according to the flow. It also generates exceptions when something needs to be reported to the operator (who is using the GCS Client).

This diagram shows an example of the messaging between subsystems, GCS and the Host System:



In this case the discharge list is distributed to the OCR engines, where it is used as reference list to be able to improve the confidence level of recognition. GCS will control the active discharge lists and handles the distribution to the correct OCR engines.

When OCR captures the data (and images) when the container is being discharged, GCS will receive an event. It stores the OCR data and reference to the images (for viewing and correction) and it forwards parts of the data to the Host System. The Host System verifies the data and responds with a match confirmation.

After the container is physically dropped underneath the Crane, the PLC interface is sending a Crane Drop event to GCS with for example a lane indicator. Also the RTLS (Real Time Location System, based on RFID and DGPS technology) subsystem sends a virtual slot id that was created for that container. This virtual slot is later used to match Shuttle pickup of the container. GCS sends a discharge confirmation to the Host System.

The actual message flow is fully visible in the GCS Client, which is very useful during testing and implementation and later on for tracing problems.

## GCS Interface Modules and Clients

For every specific task a dedicated module is designed. Many interface modules are already standard applications, which can be selected for a project. In some cases new modules will be designed or existing ones will be modified to meet the requirements for the project.

Underneath a (partial) list of available interface modules, some are referred with a global name, where it is the same module but for a different supplier:

<i>Module</i>	<i>Description</i>	<i>Subsystem</i>
<i>GCS General</i>	Windows application, to view the status of GCS processes on GCS Server(s)  and also a set of watchdogs that monitor various GCS related subsystems based on IP connections, application heartbeats, service processes	Internal
<i>GCS Message Handler</i>	Windows service, handles ALL messaging between subsystems, contains basically the entire flow	Internal
<i>GCS Cleanup</i>	Windows service, cleanup functions for GCS database	Internal
<i>GCS ABB Interface</i>	Windows service, interface with Automatic Stacking Cranes subsystem	ABB
<i>GCS TOS Interface</i>	Windows service, interface with a TOS	CyberLogitec (ATHOS ) Cosmos (CTCS) Navis (Express) Modality BT Frontline (CTROMS) Various in house systems
<i>GCS Card Access Interface</i>	Windows service, interface with Card Access Control system	Secure Logistics (CargoCard) Fabricom (Alfapass) Enyca (GISA)
<i>GCS OCR Interface</i>	Windows service, interface with HiTech Solutions OCR system for Truck, Rail and Crane	Hi Tech Solutions
<i>GCS Remote I/O</i>	Windows service, interface with PLC I/O's for barriers, loop detections, traffic lights etc.	OPC Server
<i>GCS DataDisplay interface</i>	Windows service, interface with data displays and billboards	DataDisplay

<i>GCS RFID interface</i>	<b>Windows service, interface with RFID readers, markers and tags</b>	<b>Identec</b>
<i>GCS RTLS interface</i>	<b>Windows service, interface with Sattel RTLS system for RFID and DGPS positioning</b>	<b>Identec/Sattel</b>
<i>GCS WebClient</i>	<b>Web application, the GUI for controlling and managing GCS, including a simulator</b>	<b>Internal</b>
<i>GCS Pedestal Client</i>	<b>Web application, user interface for pedestal applications</b>	<b>Internal</b>

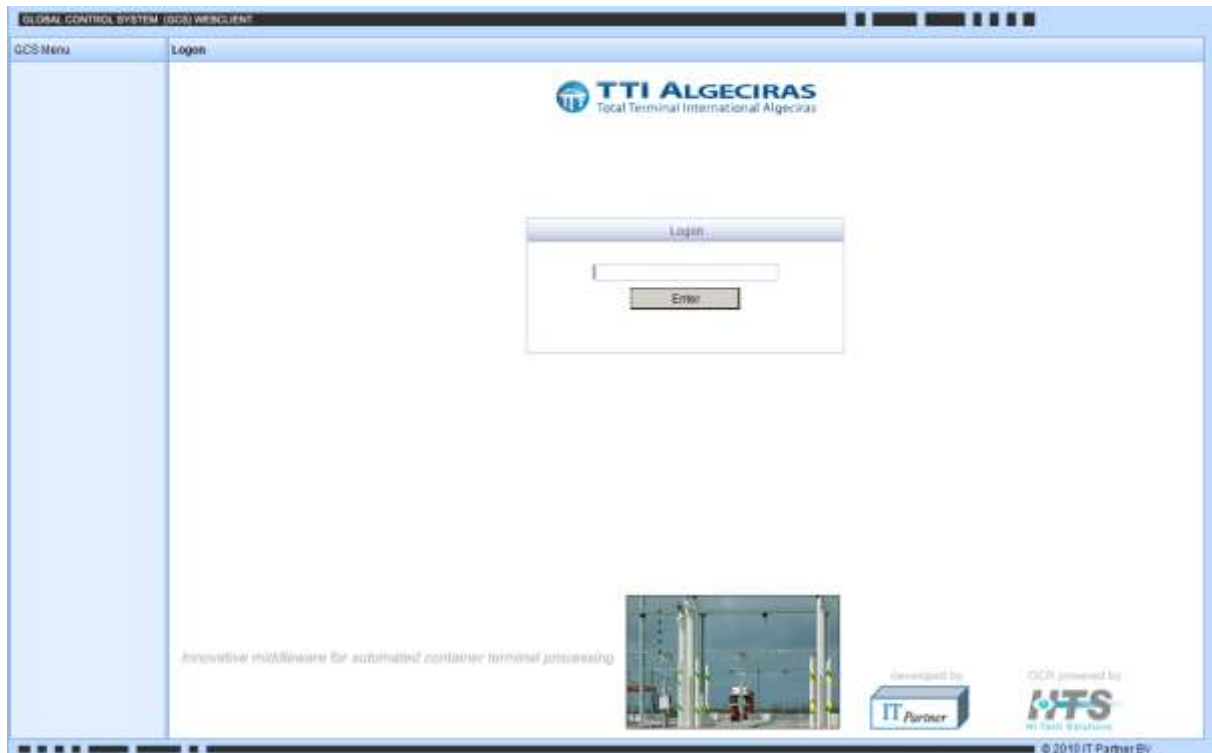
The next section will give some more in depth information for some of the modules.

## GCS WebClient

Where 90% of GCS is running invisible as Windows services on the GCS server(s), there is also a very flexible visible part of the system, known as GCS WebClient.

On the GCS Server a web application is hosted, which can be accessed from a web browser, such as Internet Explorer. It gives full control to GCS, with a lot of functions.

You can simply type the GCS servers hostname and GCS WebClient will show a logon screen, where you are invited to enter your personal ID.

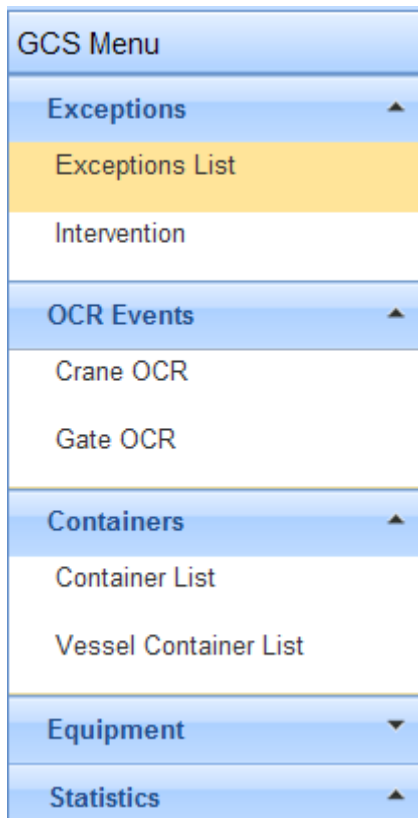


After valid logon, the system will show a menu bar and the Exceptions panel:

ID	STS	DATE/TIME	TYPE	MESSAGEID	MESSAGE	
6105	ERR	13-04-2010 18:47:48	RFID	003.001	RFID tag detected at marker, not associated with CHE: 400526199 Loop 0 400026199	Execute
6044	WRN	13-04-2010 13:25:10	ATHOS	007.002	ShC is not allowed to pickup: SH02 SENU0059838	Execute
5471	INF	13-04-2010 05:41:35	HBCHECK	012.002	Application is running: GCSTESTATHOS Athos interface:ATHOS	Execute
5470	ERR	13-04-2010 05:21:35	HBCHECK	012.001	Application has timed out: GCS1 ATHOS Athos interface:ATHOS	Execute

The Menu

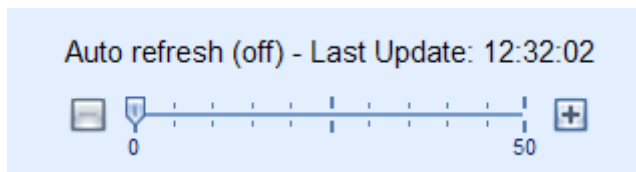
:



It is very easy to navigate through the menu's. The menu is always shown and available.

You can open and collapse the main menu options. All GCS functions can be individually authorized per user.

Exceptions



Exceptions will be shown automatically when they are initiated. The delay time can easily be set with the slider

STS	DATETIME	TYPE
ERR	13.04.2010 18:47:48	RFID
WRN	13.04.2010 13:25:10	ATHOS
INF	13.04.2010 05:41:35	HBCHECK
ERR	13.04.2010 05:21:35	HBCHECK

Exceptions are divided in to different severities, like INF (information only), WRN (Warnings) and ERR (Errors). It also shows date time information and which module has raised the exception.

description.

There is also a message ID and a clear

MESSAGEID	MESSAGE
003.001	RFID Tag detected at marker, not associated with CHE: 400526199 Loop:0 400526199
007.002	ShC is not allowed to pickup: SH02 SENU5059838
012.002	Application is running: GCSTESTATHOS Athos interface ATHOS
012.001	Application has timed out: GCS1 ATHOS Athos interface ATHOS

On detailed level GCS also the possible solution for this exception.

## OCR

The WebClient also has an perfect overview of OCR events, (Crane, Gate and Rail):

**Crane OCR List**

Search Active: Keyword  Search active

Search History: Event ID  Crane ID  CNT ID  Search History

Search Time/Date: Start Date: 13.04.2010 0:00 End Date: 13.04.2010 23:59 Search Date

Cranes:  101  102  103  104  105  106  107  108

TTIA  
Refresh  
Insert Event  
Total Events: 58

ID	STS	DATETIME	LANEINFO	MT	CNTR1	CNTR1DIR	CNTR2	CNTR2DIR	ISOCODE1	GCSCNID1	GCISISO1	GCSCNID2
365	EXE	13.04.2010 13:11:31	102/185	D	HJCU4392406	0		0	42G1			
364	EXE	13.04.2010 13:09:08	102/184	D	HJCU4047288	0		0	42G1			
363	ERR	13.04.2010 13:05:48	102/183	L	SENU4248462	0		0		SENU4248463		
362	CAN	13.04.2010 13:03:24	102/182	D	HJCU4273264	0		0	42G1			
361	EXE	13.04.2010 13:00:42	102/181	D	SENU4302732	0		0	42G1	YMLU1234567	22G1	
360	EXE	13.04.2010 12:40:56	102/180	D	SESU6008193	0		0	42G1			
359	EXE	13.04.2010 12:35:50	102/179	D	SLSU7031388	0		0	42G1			

You can filter events in various ways (date/time, crane, container etc). And you can also view images and video.

Example Crane OCR details:

**Crane OCR List**

OCR Information: Event ID: 363 Container(s): SENU 424846-2

Crane / Event: 102 / 183

Date / Time: 13.04.2010 13:05:48

Status: ERR

Movetyp: L

Cancelled Executed

GCS Containers: #01 SENU 424846-3

Pictures: CNT1, CNT1S, FILE, FILE, FILE

Videos: LEFT, RIGHT

Just select any image or video and view crystal clear pictures.

**Edit Crane OCR**

MoveType

#	Container	ISO
1	<input type="text" value="SENU4248463"/>	<input type="text"/>
2	<input type="text"/>	<input type="text"/>
3	<input type="text"/>	<input type="text"/>
4	<input type="text"/>	<input type="text"/>

Click on the Edit button and a popup window will appear where you can correct OCR data when necessary!

During editing you can still view different images to verify your input.

Example Gate OCR list:

**Gate OCR List**

Search active:

Search History:

Search Date/Time: Start Date: 14.09.2010 0:00, End Date: 14.09.2010 23:59

Lanes:  2,  21,  33,  3,  22,  11,  23,  12,  31,  13,  32

Total Events: 39

ID	SIS	DATE/TIME	LANE/INO	LIC/PLATE	LIC/CNE	CNT1	ISO1	CONE1	CNT2	ISO2	CONE2	GCS/LICPL	GCS.CNT1	GCS.ISO1	GCS.CNT2	GCS.IS2
3292	EXE	14.09.2010 19:55:24	22/ 3075	1024DCL	96											
3291	EXE	14.09.2010 19:44:30	22/ 3074	1024DCL	96	CAU2567470	22G1	100								
3282	EXE	14.09.2010 19:23:19	22/ 3073	7755D001	100											
3273	EXE	14.09.2010 19:11:09	22/ 3072	9483CGR	98	CAU8330037	45G1	100								
3253	EXE	14.09.2010 17:54:22	22/ 3071	9483CGR	100	CAU2532257	22G1	100								
3205	EXE	14.09.2010 15:59:30	21/ 141	4421FOL	99											
3199	EXE	14.09.2010 15:52:54	21/ 140	0007CKP	95	GESU2600727	22G1	100								
3162	EXE	14.09.2010 13:39:17	21/ 139	9483CGR	100	BMOU8713447	45R1	100								
3145	EXE	14.09.2010 12:50:30	21/ 138		0	HJCU2911251	22G1	100		0	9483CGR			HJCU2926436	22G1	
3124	EXE	14.09.2010 12:01:50	22/ 3070	8092DCN	98	GVCU2286797	22G1	100								
3120	EXE	14.09.2010 11:55:26	23/ 2625	9483CGR	98											
3114	EXE	14.09.2010 11:44:08	22/ 3069	1213BRN	99	HLXU2364620	22G1	100								
3111	EXE	14.09.2010 11:42:09	22/ 3068	2614BXW	98	HJCU4370032	42G1	100								

The list also show result statistics for the selection at the bottom of the screen:

EXE 14.09.2010 10:05:15 23/ 2617 2170BGJ 96 CMUJ2266798 BM22 100

Statistics >> Executed Events: 39 - OCR Lic. Plates: 38 - Corrections: 1 - Successful Lic. Plate OCR: 97.4% - OCR Containers: 25 - Corrections: 1 - Successful OCR Containers: 96.0%

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### Example Gate OCR details:

#### License plate:

**Lane OCR Media**

OCR Information  
Event ID: 3100    Lic. Plate(s): 2565GVN    100%  
Lane / Event: 22    3064  
Date / Time: 14.09.2010 11:27:53    Container(s): HJCU 432208-1    4261    100%  
Status: EXE

OCIS Corrections

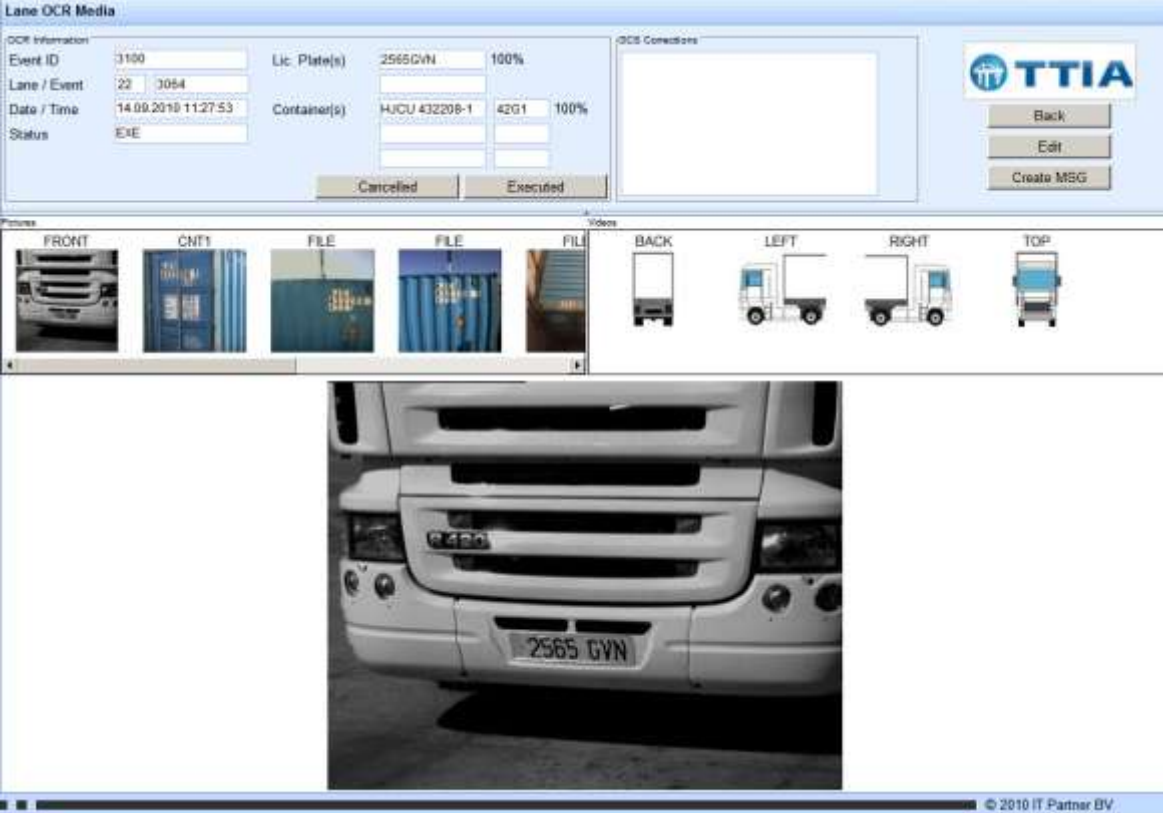
TTIA

Back  
Edit  
Create MSG

Cancelled    Executed

Picture: FRONT    CNT1    FILE    FILE    FILE

Video: BACK    LEFT    RIGHT    TOP



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#### Container image:

**Lane OCR Media**

OCR Information  
Event ID: 3100    Lic. Plate(s): 2565GVN    100%  
Lane / Event: 22    3064  
Date / Time: 14.09.2010 11:27:53    Container(s): HJCU 432208-1    4261    100%  
Status: EXE

OCIS Corrections

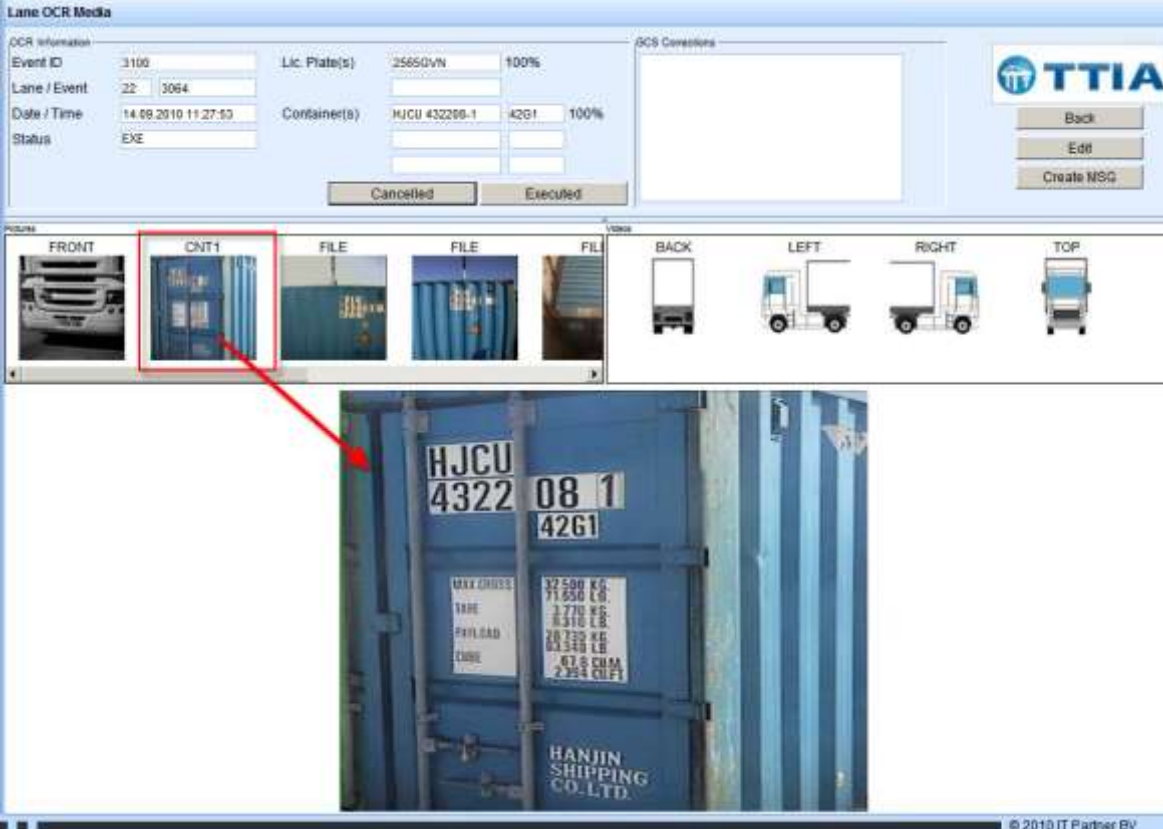
TTIA

Back  
Edit  
Create MSG

Cancelled    Executed

Picture: FRONT    CNT1    FILE    FILE    FILE

Video: BACK    LEFT    RIGHT    TOP



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Video top position:

**Lane OCR Media**

OCR Information  
 Event ID: 3100 Lic. Plate(s): 2985GVN 100%  
 Lane / Event: 22 / 3064  
 Date / Time: 14.09.2010 11:27:53 Container(s): HJCU 432208-1 42G1 100%  
 Status: EXE

OCIS Corrections

TTIA  
 Back  
 Edit  
 Create MSG

Cancelled Executed

FRONT CNT1 FILE FILE FILE BACK LEFT RIGHT TOP

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Alternate quick overview of recent license plate events:

**Gate Events** Auto refresh (off) - Last Update: 21:33:18

Select lanes

Lane	Image	Lic. Plate	Date / Time	Lic. Plate	Details
Lane12 96%		1024DCL 14-9-2010 19:43:05 <a href="#">info</a>	14.09.2010 19:43:05 14.09.2010 19:42:46 14.09.2010 19:21:27 14.09.2010 19:09:21 14.09.2010 19:05:29	1024DCL 3917FKR 7755DXH 9483CGR 9483CGR	<a href="#">info</a> <a href="#">info</a> <a href="#">info</a> <a href="#">info</a> <a href="#">info</a>
Lane13 98%		9483CGR 14-9-2010 11:53:44 <a href="#">info</a>	14.09.2010 11:53:44 14.09.2010 10:50:08 14.09.2010 10:48:48 14.09.2010 10:48:29 14.09.2010 10:38:31	9483CGR 1368GBG 3912DTM 5096FRM 3917FKR	<a href="#">info</a> <a href="#">info</a> <a href="#">info</a> <a href="#">info</a> <a href="#">info</a>
Lane32 85%		9487CGP 14-9-2010 19:30:46 <a href="#">info</a>	14.09.2010 19:30:46 14.09.2010 18:09:42 14.09.2010 17:19:06 14.09.2010 07:18:29 13.09.2010 19:12:03	9487CGP 9483CGR 9483CGR ..... 0759DDC	<a href="#">info</a> <a href="#">info</a> <a href="#">info</a> <a href="#">info</a> <a href="#">info</a>
Lane33 85%		9483CGR 14-9-2010 13:59:07 <a href="#">info</a>	14.09.2010 13:59:07 14.09.2010 13:16:44 14.09.2010 12:23:27 13.09.2010 19:15:12 13.09.2010 15:33:22	9483CGR 9483CGR 9483CGR CA4265BG 4059FFS	<a href="#">info</a> <a href="#">info</a> <a href="#">info</a> <a href="#">info</a> <a href="#">info</a>

## Messages

You can monitor the messages between the subsystems and check the flow:

MSGNR	MSGMODULE	MSGID	MSGINFO	MSGDIR	MSGSTS	MSGCRTTS
28017	RTLS	SHUTTLEPICKUP	SH02 CRANE QC1001 STS101.2.C.0	I	2	13.04.2010 12:33
28014	ATHOS	SHUTTLEPICKUPREQUEST	SH02 CRANE QC1001 FSCU9240589 STS101.2.C.0	O	2	13.04.2010 12:33
28013	RTLS	SHUTTLEARRIVALPICKUP	SH02 CRANE QC1001 STS101.2.C.0	I	2	13.04.2010 12:33
28011	ATHOS	CRANEOCRDATA	STS101 TRLU806526	O	2	13.04.2010 12:33
27971	ATHOS	SHUTTLEPICKUPREQUEST	SH03 CRANE QC1005 HJCU1104039 STS101.1.C.0	O	2	13.04.2010 12:31
27969	RTLS	CRANEDROPCONFIRMATION	STS101	O	2	13.04.2010 12:31
27968	ATHOS	CRANECONTAINERDISCHARGECONFIRMATION	STS101.1.C.HJCU1104039 QC1005	O	2	13.04.2010 12:31
27967	RTLS	CRANEDROP	STS101 CRANE QC1005	I	2	13.04.2010 12:31
27928	RTLS	SHUTTLEPICKUP	SH02 CRANE QC1003 STS101.1.C.0	I	2	13.04.2010 12:30
27926	ATHOS	SHUTTLEPICKUPREQUEST	SH02 CRANE QC1003 TRLU7425030 STS101.1.C.0	O	2	13.04.2010 12:30
27925	RTLS	SHUTTLEARRIVALPICKUP	SH02 CRANE QC1003 STS101.1.C.0	I	2	13.04.2010 12:30
27793	ATHOS	CRANEOCRDATA	STS101 HJCU1104039	O	2	13.04.2010 12:26

You can easily filter the list:

### Message List

Filter messages

Message module:

Message ID:

Filter MSG's:

Date:  till

Toggle Status

You can view the details for every individual message:

### Message details

Message details


Message Nr: 1592738

Message module: ATHOS

Message ID: GATEOCRDATA

Message Status: 2

Date: 14.09.2010 12:52:56



Nr	Module	ID	Info	Dir.	Status	Created	Executed
1592738	ATHOS	GATEOCRDATA	Gate: 21 9483CGR HJCU2911251 HJCU2926436	O	2	14.09.2010 12:52:56	14.09.2010 12:52:56
1592739	ATHOS	GATEOCRDATARESULT	9483CGR HJCU2911251 Y HJCU2926436 Y	I	2	14.09.2010 12:52:56	14.09.2010 12:52:57

4 |

Date of message creation	20100914	DATE
Time of message creation	125256	TIME
GCS Event ID	1592738	GCSEVENTID
Gate ID	01	GATEID
Transaction ID	1	TRANSACTIONID
Truck License Plate	9483CGR	TRUCKID
Number	3	COUNT
OCR Event ID	3145	OCREVTID
1. Container ID	HJCU2911251	CNTID
1. Container ISO code	2201	CNTISO
2. Container ID	HJCU2926436	CNTID
2. Container ISO code	2201	CNTISO
3. Container ID	HJCU2926436	CNTID
3. Container ISO code	2201	CNTISO

And every message can be simulated during testing and implementation:

**Message Insert**

Message Type: [ ]

Module: PEDESTAL [v]

Message ID: SHOW/O [v]

Message info: [ ]

Refrn: [ 0 ]

Number: [ 1 ]

[ Generate ]

---

Message Header

Module	PEDESTAL	Direction	0	
Message ID	SHOW	Refrn	0	[ Save ]

Panel to show: [ ] PANEL

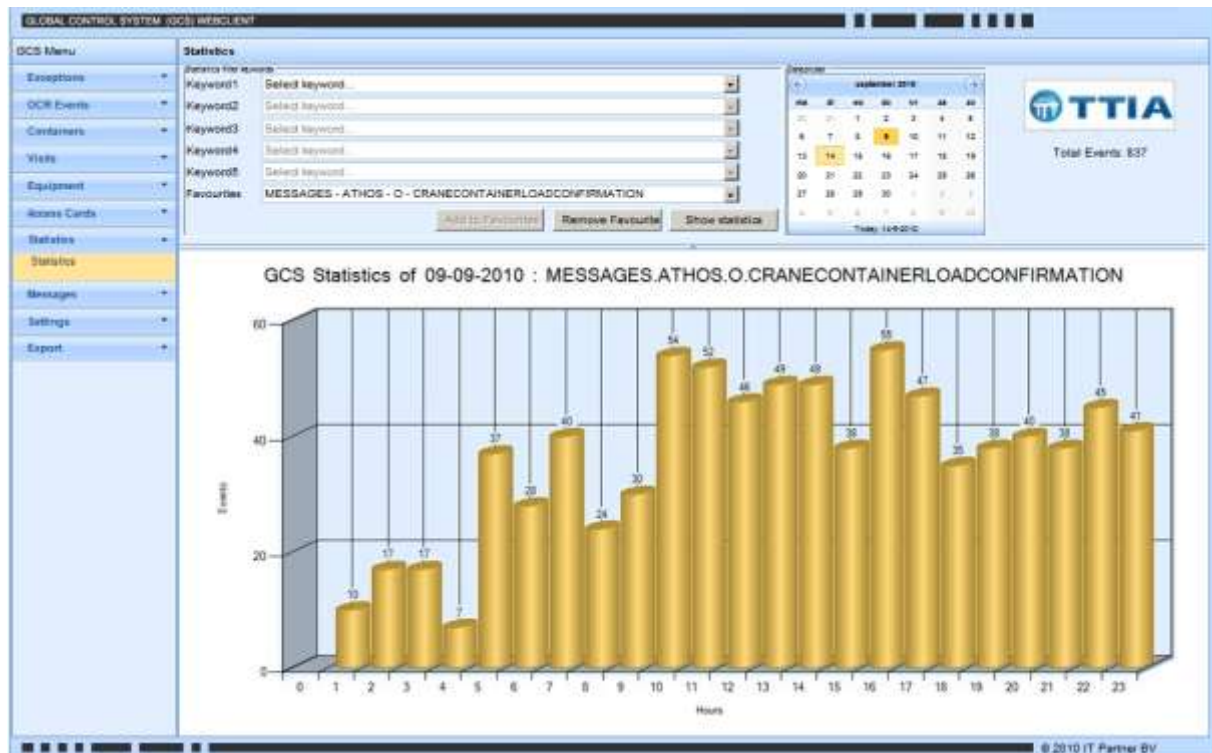
Pedestal: [ ] PEDESTAL

1. Data element: [ ] DATA

Just select a message, click on button generate and fill in the data.

### Statistics

GCS can provide statistic information on various data stream, like specific subsystem, or messages and also OCR:



It is up to 5 levels deep and you can save favourite selections per user.


## Remote IO

### Control IO (barriers, loops, signage) from GCS

Filter Remote IO

Phase:

Processpoint:



Total Events: 18

ID #	Description	Value	Action	Process Point
1	Gate In 1 Both Barriers Open			Gate IN Lane 1
2	Gate In 1 Cross Arrow		<a href="#">ON</a>	Gate IN Lane 1
3	Gate In 1 in Barrier		<a href="#">ON</a>	Gate IN Lane 1
4	Gate In 1 in Barrier Is Closed			Gate IN Lane 1
5	Gate In 1 in Barrier Is Open			Gate IN Lane 1
6	Gate In 1 in Traffic Light Is Green			Gate IN Lane 1
7	Gate In 1 in Traffic Light Is Red	ON		Gate IN Lane 1
8	Gate In 1 Loop 0			Gate IN Lane 1
9	Gate In 1 Loop 1			Gate IN Lane 1
10	Gate In 1 Loop 2			Gate IN Lane 1
11	Gate In 1 Loop 3			Gate IN Lane 1
12	Gate In 1 Loop 4			Gate IN Lane 1
13	Gate In 1 Out Barrier		<a href="#">ON</a>	Gate IN Lane 1
14	Gate In 1 Out Barrier Is Closed			Gate IN Lane 1
15	Gate In 1 Out Barrier Is Open			Gate IN Lane 1
16	Gate In 1 Out Traffic Light Is Green			Gate IN Lane 1
17	Gate In 1 Out Traffic Light Is Red	ON		Gate IN Lane 1
18	Gate In 1 Occupied status	ON	<a href="#">OFF</a>	Gate IN Lane 1


This screen shows all I/O for 1 truck lane, where the user can control the cross/arrow signs and barriers using ON/OFF hyperlinks.

## Access Cards

### Monitor access card information:

Search Card

Search:



Total Events: 24

CARDID	DRIVERNAME	SURNAME1	SURNAME2	COMPID	COMPNAME	LANGUAGE	CARDUSED	CRITS	CHGTS
017564698762	COTRANSA	TRANSPORTES		15	COTRANSA ANDALUCIA	SP	13	07.09.2010 14:59:50	10.09.2010 14:12:16
002606927	PRUEBA2	Nuño	Jiménez			SP	36	29.07.2010 15:40:03	04.08.2010 16:39:12
002999179	PRUEBA	Gómez	Puente	1	ENYCA SEGURIDAD	SP	72	29.07.2010 15:40:00	05.08.2010 12:24:09
017564698152	PRUEBA01	TTIA				SP	13	11.08.2010 16:32:39	12.08.2010 17:51:47
017564697503	PRUEBA04	TTIA				SP	1	11.08.2010 16:32:23	11.08.2010 16:32:23
017564697962	PRUEBA02	TTIA				SP	1	11.08.2010 16:32:34	11.08.2010 16:32:34
017564697981	PRUEBA12	TTIA				SP	1	11.08.2010 16:31:14	11.08.2010 16:31:14
017564698205	PRUEBA10	TTIA				SP	1	11.08.2010 16:31:29	11.08.2010 16:31:29
017564700109	PRUEBA11	TTIA				SP	1	11.08.2010 16:30:45	11.08.2010 16:30:45
017564701212	MIGUEL ANGEL	SANCHEZ	MEDINA			SP	24	10.08.2010 17:53:24	11.08.2010 15:53:48
017564704255	PRUEBA05	TTIA				SP	1	11.08.2010 16:32:17	11.08.2010 16:32:17
017564704655	PRUEBA06	TTIA				SP	1	11.08.2010 16:32:10	11.08.2010 16:32:10
017564705045	PRUEBA07	TTIA				SP	1	11.08.2010 16:32:02	11.08.2010 16:32:02
017564705173	PRUEBA03	TTIA				SP	1	11.08.2010 16:32:29	11.08.2010 16:32:29
017564705425	PRUEBA08	TTIA				SP	1	11.08.2010 16:31:52	11.08.2010 16:31:52
017564706363	PRUEBA09	TTIA				SP	1	11.08.2010 16:31:38	11.08.2010 16:31:38
017564700921	COTESA	TRANSPORTES		18	COTESA	SP	17	07.09.2010 16:48:35	09.09.2010 09:43:48
017564700682	JORGE	LOPEZ	MUÑOZ	14	TRANSPORTES ALONSO SALCEDO	SP	25	13.09.2010 12:37:11	14.09.2010 19:32:39
017564698763	TRANSMAGSA	TRANSPORTES		17	TRANSMAGSA	SP	9	07.09.2010 16:56:54	13.09.2010 11:41:19
017564699975	ALTRANSA	TRANSPORTES		16	ALTRANSA	SP	37	07.09.2010 17:11:52	13.09.2010 14:29:25
017564701070	ANTONIO	TAPIA	BENITEZ	14	TRANSPORTES ALONSO SALCEDO	SP	3	08.09.2010 19:01:23	08.09.2010 19:23:55
017564698756							11	09.09.2010 11:55:12	13.09.2010 14:16:04
017564698100	RUBEN	RAMIREZ	PORTILLO	14	TRANSPORTES ALONSO SALCEDO	SP	6	09.09.2010 16:43:36	10.09.2010 08:51:49
017564700256	MANUEL	ROMAN	DELGADO	14	TRANSPORTES ALONSO SALCEDO	SP	2	10.09.2010 09:56:05	10.09.2010 10:02:49

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# Pedestal client

For Gate operations often pedestals with various devices are used, including touch panels. GCS provides a Pedestal Client, fully controlled from GCS, which enables truck drivers to enter information during the Gate process.

Example initial screen, where the driver is asked to use his access card.



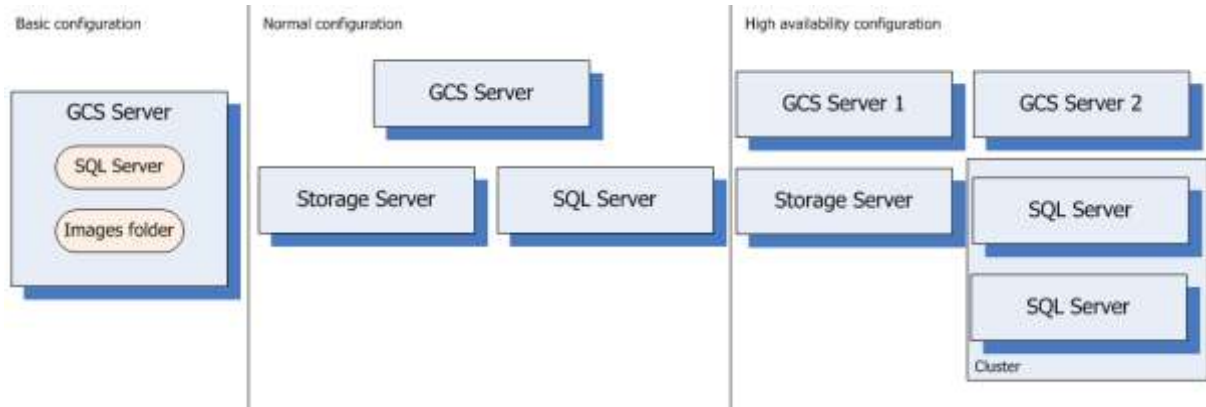
Example input screen, type in reference.



This application will be formatted according the customer's flow.

## GCS Systems

To run GCS we have 3 possible configurations (variations are possible too, depending on customer's requirements).



- **Basic configuration**

A single server, including SQL Server and enough disk space to host images and video data. All GCS modules will be installed on this server.

- **Normal configuration**

Like basic, only divided on 3 different servers. GCS modules running on the GCS Server, data stored on a SQL Server (maybe already available sharing multiple databases). Images/video files stored on a separate data server.

- **High availability configuration**

Like normal, with 2 GCS Servers with all modules installed, load balancing is possible, or just hot standby. Upgrades better manageable. Also cluster for SQL to ensure high availability

All servers can be virtualized. We strongly advise to use high availability and recovery solutions to reduce downtime.

Also remote access to all servers (and devices in the field) is required for efficient support and implementation, such as VPN in combination with remote tools, like RDP, VNC, Teamviewer etc.

It is also necessary to have time synchronization on all servers using a centralized time server, including OCR engines, to be able to link events based on timestamps.

For installation and support purposes IT Partner needs its own windows user ID with (local) administrator rights.

All applications are designed with Microsoft Visual Studio .Net for the Microsoft .Net framework environment.

## **Recommendations**

### **Software versions:**

**Windows Server:** preferred: version 2003, 32 or 64 bit version (or newer)

**MS SQL Server:** preferred: version 2005 (or newer)

**All English versions!**

## **GCS Support**

**GCS is constantly monitored from our office. We have added a module called GCS Support that can send status information to our office. Preventive daily checks are also done by our team to ensure that everything is up and running.**