Portable Demo v.1.0 **Technical Specification**

Table of contents

I able of contents	.2
Minimum hardware requirements	.3
System requirements	.3
Network installation requirements	.3
Installing the software	.3
Configuring the server	.3
Configuring RFID readers	.5
Configuring client(s)	.6
Advanced network configuration (PDServer.exe.config file - for the server, and	
PDClient.exe.config - for clients)	.8
Preparing data for demonstration	.8
Starting the demonstration1	2
Demonstrating EPCglobal network functionality1	3
Licence	26
Appendix A: Programming RFID Tags using CAEN A948EU reader2	28
Appendix B: Programming RFID EPC Gen2 tags using SAMSys MP9320 v2.8e reader3	31
Appendix C: Troubleshooting	34

Minimum hardware requirements

PC incl. Pentium III 1000 MHz or higher, RAM 256 MB, screen resolution 1024x768

System requirements

Operating system: Microsoft Windows 2000, XP or 2003

Network installation requirements

Network adapter with drivers supporting TCP/IP.

Installing the software

Portable Demo is made up of two components: the server and the client. The server is installed by running "setup.exe" in the *PDServer* folder, whereas client is installed by running "setup.exe" from the *PDClient* folder. Administrator's rights are required to run the programme in both cases. During installation, the application automatically downloads missing components, such as .NET Framework 2.0. Follow the installation instructions appearing on the screen.

Configuring the server

Portable Demo Server is the first element to be run.

During start-up, you will be requested to specify the target folder for the database file.

Databas	e configuration 🔀
(f)	Choose directory for program's database.
4	> if you want to run all clients local - it should be local path (for example "c:\program files\database")
	> if you want to run program over network - it should be shared folder (for example "\\computer\sharedfolder") with full permission (read & write) for every user who want to connect
	> if you plan connecting more than 10 users - It should be shared folder running on server
	OK Anuluj

This location should be specified in such a way that full permission (read and write) is possible for each client and for the server in the following fashion:

- If the software is installed on one workstation only, all you need to do is specify any folder on the local drive.
- If, however, the software is installed on several workstations, the target location must be a network path to a shared folder (with full permission) on any PC / server in the local network. Described below is the folder sharing process:
 - Ensure Windows XP Simple File Sharing is enabled. (details can be found in Windows Help)

- 2. Open Windows Explorer (or My Computer).
- 3. Navigate to the file, folder or drive folder to be shared, and click once on its icon to select it.
- 4. From either the File menu or the right-click menu, choose the "*Sharing and Security*..." option. A new Properties window appears. If this option did not appear on the menu, ensure that a valid file or folder was selected in the previous step.
- 5. Click the *Network* tab in the *Properties* window. If no *Network* tab appears in the window, but a *Sharing* tab appears instead, close this window and ensure the *Simple File Sharing* option was enabled in the previous step, before proceeding.
- 6. Click the Share This Folder option in the Properties window to enable sharing of this resource. This allows all other computers in the local network to access file(s) but not modify them. To grant others permission to modify these files, click the "Allow Network Users to Change My Files" checkbox to enable this option.
- 7. Alternatively, if the *Network* tab is not enabled, make the required settings in the *Sharing* tab to configure the equivalent sharing. Choose "*Share this folder*" to enable sharing.
- 8. Click Apply or OK to save these settings.

An alternative way to share files and folders entails moving or copying them to the *Shared Documents* folder. In Windows, all files contained in the *Shared Documents* folder are automatically shared in the local network.

The procedure for sharing files in Windows 2000 and earlier versions of Windows can be accessed from the "*File/Sharing*" menu in *Windows Explorer*.

Once you have made the relevant choice, the application will initiate the database according to a *default* model, i.e. standard.mdb (to be found in the application model folder). To ensure that everything is working properly please pause and start server application.

After this final step the server is now successfully configured and you can minimize its window to toolbar.

🗈 Server	
Server RFID Readers Database	About
 Force Provide listening for broadcast on UDP: 11000 Ustening for client on TCP: 339 Database Shared folder: C:\Program Files\Portable Demo - Server Template: C:\Program Files\Portable Demo - Server\templates\standard.rdb Clients Distributors Clients Readers 	

Configuring RFID readers

Portable Demo Server can support any number of readers simultaneously. The current compilation provides for the connection of two types of readers: CAEN and SAMSys. Readers can be configured with PD client support activated. The current status of reader connection is signalled with icon colours: red - reader not connected; yellow - reader connection in progress; green - reader connected. Each configured reader is saved by the application and stored in the local configuration file. With each start of the server, the application tries to connect to each reader. Errors are signalled with the relevant messages.



Communication with RFID readers may only take place via TCP/IP. The local reader name, its type and IP address must be specified as part of the configuration.

🗈 Reader's configuration 🛛 🔀								
Configuration Name:	CAEN							
Туре:	CAEN Reader	~						
IP Address:	192.168. 99 .200							
Mapping								
Mapping type:	auto for all users	*						
User: MMG Co.		~						
Cancel	OK							

Another, very important group of parameters involves mapping, i.e. transmitting RFID tag identification results obtained by readers to selected Portable Demo users directly or from specified system groups. Principle of operation:

- user mapping once listening to reader action is activated by clicking the relevant button Capture reader in the client programme, all actions of readers set for this user will be sent to the user
- group mapping (e.g. all distributors group) once listening to reader action is activated by the user, all actions of readers set for mapping of this user's group will be sent to the user (until the listening is disabled or the process is enabled by another user in the same mapping group)
- mapping for all identical procedure to group mapping, however this applies to all Portable Demo users

🕨 Reader's configuration 🛛 🛛 🔀								
Configuration								
Name:	CAEN							
Туре:	CAEN Reader							
IP Address:	192.168. 99 .200							
Mapping								
Mapping type:	auto for all users 🛛 😽							
User: MMG Co.	auto for all manufacturers auto for all distributors auto for all clients							
Cancel	auto for all users specified GLN number							

By clicking OK, data will be saved and an attempt will be made at connecting to the reader.

Configuring client(s)

There is no restriction in *Portable Demo* as to the number of clients connected to the server or instances of clients activated on a given PC. Each newly activated client automatically searches for the server address by sending a broadcast message. It is necessary that the server be activated and fully preconfigured at that moment. In the case of failure (e.g. the server is in a different subnetwork than the client), the server IP address should be entered manually.

Communication	/
Auto discovery server:	
Server IP address:	
Exit	ОК
Enter server's IP address	

In Windows, the current IP address of a PC is checked using the *ipconfig* command. To do this, select *Run* from the *Start* menu, enter the command *cmd* and click OK.

C:\WINDOWS\system32\cmd.exe	- 🗆 🗙
Microsoft Windows XP [Wersja 5.1.2600] (C) Copyright 1985-2001 Microsoft Corp.	-
C:\Documents and Settings\mgrabia>	
	-

A black screen will appear where you should enter *ipconfig* and press Return. Then you will see all data related to network configuration.

The IP address should be entered in the Server IP address field.

Communication	
Auto discovery server:	×
Server IP address:	192.168.1.64
Exit	ОК
Enter server's IP address	

Once you have entered the IP number and clicked $\bigcirc K$, the number will be saved in the local settings of the user and used automatically with subsequent activation of the client.

Advanced network configuration (PDServer.exe.config file - for the server, and PDClient.exe.config - for clients)

There is a possibility of interfering with *Portable Demo* communication ports. One must bear in mind that the same values must be entered for the server and for each client.

The value TCP_PORT is the number of the listening port of the server for PD clients

The value UDP_PORT is the number of the listening port for automatic server search in the local network.

Preparing data for demonstration

The *Portable Demo* software has an inherent database storing information on the users of a simulated supply chain and goods included in the presentation. In order to enable a fast demonstration start, 3 business locations and 5 standard pallets have been implemented in the database. Using *default* data is not, however, necessary and users may add their own products and supply chain participants to the database. Any changes related to business locations and EPC codes are implemented using *Portable Demo Server*. The option related to specifying the number and type of business locations in the supply chain created can be found in the menu:

Database >> Template configuration >> Users (GLN)

Once you have activated the above option, you will see the following window: Add users (GLN)

Usertune	Name	GLN	Address	Citu
Manufacturer V	MMG Co	590000000	Estkowskiego 6	Poznan
Distributor 🗸	DistriBrand Co.	5909999000	Sobieskiego 10	Wroclaw
Client 🗸	Bestshopping Co.	5901111000	Mieszka 145	Warszawa
~				

Select one of three Client available types of business locations from the menu Manufacturer . Then, enter descriptions for all locations in the remaining fields. The system

enables any number of supply chain users to be added (Add new).

The next step is to specify warehouse stock for each business location. In order to add or modify pallet and collective packaging data at a given manufacturer, distributor or client, use the menu.

Database >> Template configuration >> Tags

If the Tags function is called, the Change data (TAGS) window appears.

B) C	hange data (TAG	S)									
MM	MMG Co.										
	SSCC (URI) Gross Wi weight of pa			Width of pallet [mm]	/idth of Length of H allet [mm] pallet [mm] p		eight of Color allet [mm]		RFID Tags		
•	um:epc:id:sscc:590	0000.04000	100	800	1200	1000	1000 Blue 💊				
	urn:epc:id:sscc:590(0000.04000	100	800	1200	1000	Green 🔽	1			
	urn:epc:id:sscc:590(0000.04000	100	800	1200	1000	Red 🔽				
	urn:epc:id:sscc:590(0000.04000	80	800	1200	1000	Orange 🔽				
	um:epc:id:sscc:590	0000.04000					Violet 🔽	~			
	SGTIN (URI)			LOT		Use by					
۲.	urn:epc:id:sgtin:590(0000.055510.4	158623	458623							
	urn:epc:id:sgtin:590	0000.055510.4	158621	458621							
	urn:epc:id:sgtin:590(0000.055510.4	158622	458622	458622						
	urn:epc:id:sgtin:590(0000.055510.4	158620	458620	458620						
*											
									< >		
GS1	Identifier (GTIN)	Product nam	e						Product symbol		
5900	000055510	VERBATIM	COLLECTIVE	PACKAGING 10 F	PCS.				55510		
Quar	nt. of single unit in col	lective	Quantity of sing	le unit on pallet	Gross we	eight of collective	e packaging	Ne	t weight of collective packaging		
10			40		25	24					
Leng	th of collective packa	aging (mm)	Width of collec	tive packaging (mi	m] Height ol	Height of collective packaging [mm]			Store temperature [C]		
300			200		250						

The first to be selected should be the business location for which the warehouse stock will be specified. In the default view, it is the first location of a previously created list of the supply chain users (*Add users GLN*).

The EPC numbers added may be completely virtual (created using a number generating machine, e.g.: <u>http://www.gs1-germany.de/internet/content/e39/e52/e3401/e3630</u>) or they can be numbers actually saved in RFID tags. In the former case, the generated SSCC number should be entered manually in the field SSCC(URI), whereas SGTIN numbers should be entered in the fields SGTIN(URI). One should bear in mind that the SGTIN numbers entered are automatically assigned to the specified SSCC number and form a pallet with the latter. SGTIN numbers may represent one type of product or different products. Depending on the selected model, homogeneous pallets or mixed pallets are created.

The use of EPC numbers saved in RFID tags is facilitated in the software to the greatest possible extent. It is thus possible to simply read EPC numbers using a physical reader (they appear in the RFID Tags window) and transfer numbers by dragging and dropping into the corresponding cell on the left-hand side.

🚯 Change data (TAGS)									
MMG Co.			~	🛃 Save Data	🛛 🔒 Clear Ta	ag window			
SSCC (URI)		Gross weight of	Width pallet	iof L [mm] p	ength of allet (mm)	Height of pallet [mm]	Color	^	RFID Tags
urn:epc:id:sscc:590	0000.04000	100	800	12	200 .	1000	Blue 💊	·	🔲 um:epc:id:sgtin:0067953.1982
urn:epc:id:sscc:590	0000.04000	100	800	12	200 .	1000	Green 💊		urn:epc:id:sgtin:0067953.1982
urn:epc:id:sscc:590	0000.04000	100	800	12	200 .	1000	Red N	~	untepc://sgtin:0067953.1982
urn:epc:id:sscc:590	0000.04000	80	800	12	200 .	1000	Orange 💊	. –	
urn:epc:id:sscc:590	0000.04000			RFID Tags	:			1	
um:epc:id:sgtin:590 um:epc:id:sgtin:590 um:epc:id:sgtin:590 um:epc:id:sgtin:590 um:epc:id:sgtin:590 wm:epc:id:sgtin:590	0000.055510.4 0000.055510.4 0000.055510.4 0000.055510.4	158623 158621 158622 158620	4	urn:epc: urn:epc: urn:epc: urn:epc:	id:sgtin:0067 id:sgtin:0067 id:sgtin:0067 id:sgtin:0867	/953.19823 /953.19823 /953.19823 /953.19823 /360217.00	3.223338 3.223338 3.223338 3.223338 5.889520	31948 31950 31940 128	34 00 04 × • • • • • • •
GS1 Identifier (GTIN)	Product nam	e							Product symbol
590000055510	VERBATIM	COLLECTIVE	PACKA	GING 10 PCS.	3				55510
Quant. of single unit in co	llective	Quantity of sin	gle unit	on pallet	Gross weigh	nt of collective	e packaging	Net	t weight of collective packaging
10		40			25			24	
Length of collective pack	aging (mm)	Width of collec	ctive par	ckaging (mm)	Height of co	ollective pack	aging (mm)	Sto	re temperature [C]
300		200			250				

All numbers are presented in URI form. To see them in hexadecimal form please use option:

RFID readers >> tags monitor

🐌 Tags Monitor										
Tag (HEX)	Reader	URI	Туре	Header	Filter	Filter type	Partition	Prefix	Refere	Serial number
30-08-33-B2-DD-D9-01-40-35-05-00-00	CAEN	urn:epc:id:sgtin:08	SGTIN-96	48	0	All Others	2	0867360217	005	889520128
30-94-04-25-C4-C1-96-74-00-00-4E-8C	CAEN	urn:epc:id:sgtin:00	SGTIN-96	48	4	Reserved	5	0067953	198233	223338319500
30-94-04-25-C4-C1-96-74-00-00-4E-6C	CAEN	urn:epc:id:sgtin:00	SGTIN-96	48	4	Reserved	5	0067953	198233	223338319468
30-94-04-25-C4-C1-96-74-00-00-4E-7C	CAEN	urn:epc:id:sqtin:00	SGTIN-96	48	4	Reserved	5	0067953	198233	223338319484
30-94-04-25-C4-C1-96-74-00-00-4E-2C	CAEN	urn:epc:id:sgtin:00	SGTIN-96	48	4	Reserved	5	0067953	198233	223338319404
30-08-33-B2-DD-D9-01-40-35-05-00-00	CAEN	urn:epc:id:sgtin:08	SGTIN-96	48	0	All Others	2	0867360217	005	889520128
30-94-04-25-C4-C1-96-74-00-00-4E-8C	CAEN	urn:epc:id:sgtin:00	SGTIN-96	48	4	Reserved	5	0067953	198233	223338319500

The programme also enables empty pallets to be created, the content of which will only be defined during demonstration. In order to create an empty pallet, all you need to do is add an SSCC number, leaving the SGTIN (URI) fields empty. When adding new EPC (SGTIN) numbers to the database, one should bear in mind that these represent physical objects. Hence, the relevant descriptions should be completed, which are necessary for subsequent identification of the goods in virtual warehouses.

GS1 Identifier (GTIN) Product name					Product symbol				
5900000055510 VERBATIM - C		VERBATIM - CO	OLLECTIVE PACKAGING 10 PCS.			55510			
Quantity of single	Quantity of single unit on pallet Gross weight of collective packaging [kg] Net weight Veight				Height of				
10	40		25	24	300	200		250	

In the case of SSCC numbers it is only necessary to specify geometrical dimensions of the pallet and the colour in which it will be represented during demonstration. You should not forget that saving data relating to users and data of warehouse stocks is done using the current <u>template</u> used, therefore this information will not be visible on the part of PD clients until the function resetting the presentation database to the current template is used:

Database >> Reset database to template

Portable Demo can set its database using different templates identified by the user, it is thus worthwhile creating several own templates and using them depending on their needs and presentation requirements. Templates can be created based on existing models or from scratch. To do this, copy the file to any existing template (or an empty template, "empty.mdb") and save it under any name (template files are located in the /templates folder) and then set it in the programme

Database >> *Template configuration* >> *Set database template*

and perform operations related to the setting of users and warehouse stocks presented above.

Starting the demonstration

The demonstration scenario provides for the use of 4 workstations and a virtual reader. You should not forget that Portable Demo may also be used on a greater number of computers using actual readers. The prepared scenario is aimed at presenting the basic functionality of the programme, which always looks the same, irrespective of the size of the supply chain (number of manufacturers, distributors, clients).

The first stage of the demonstration is to make sure that all system components are correctly installed and configured on 4 PCs (the server installed on one PC and clients on the remaining three workstations) joined in a local network.

In order to find out how to install and configure the components of *Portable Demo Server* and *Portable Demo Client* \rightarrow *see pages 3-8 of the user manual*

Having activated the server, run Portable Demo Client.

v≊ Portable Demo	BRIDGE	
	Login Select user type: Manufacturer Select user name: MMG Co. Exit OK Choose type and user name	Gi Order picking 🔛 Inventory 🧮 EPCIS/Middleware

The programme will automatically find the server in the network. The next step is to select user type. In the case under consideration, the supply chain consists of three partners only: the manufacturer, the distributor and the client. You should thus select a different user type on each PC.

~ Login		
Select user type:	Manufacturer	×
	Manufacturer Distributor Client	
Select user name:	MMG Co.	~
Exit		ОК

For demonstration purposes, only one participant of the supply chain of a given type has been entered into the database. The selection of the name is thus predetermined. In the case of more complex supply chains, it is possible that there will be several users of the same type to select from. It is thus necessary to select the name of the company to which we want to log in.

Demonstrating EPCglobal network functionality

The presentation starts at the manufacturer's location (having successfully logged onto the server of three clients as users of different types: manufacturer, distributor, client)



Once you have logged on, the view automatically sets to inventory of a given supply chain participant. In the right hand side window, you san see a list of products available including GTIN numbers of collective packaging and their count in the warehouse. The goods available in the virtual warehouse will form the basis for creating pallets allocated for shipment. In order to be able to prepare a shipment it is necessary to change the view from Inventory to Order picking. This can be modified using the view buttons to the right hand side of the window.

🔁 Order picking [Inventory 📰 EPCIS/Middleware

As a result of change, the following screen will appear:

VE MMG Co Manufacturer - Portable Demo			
Destination	Inventory DNAge HAND - COLLECTIVE PACKAGING Image HAND - COLLECTIVE <tr< th=""><th><mark>à 20 Pcs.</mark> 011</th><th>광 order picking 🖓 Invent</th></tr<>	<mark>à 20 Pcs.</mark> 011	광 order picking 🖓 Invent
Before you start to create order, choose destination from the list above.			ry 📰 EPCIS/Middleware
	Item properties Type GLN Portable demo actor	Data	
Control panel Create order Finalize	GLN number Name Address	5909999000051 DistriBrand Co. Sobieskiego 10	

The first action that must be carried out before starting order picking, is to select the recipient of our shipment. The selection is made using the drop-down menu designated as "Destination".

Destination	
Bestshopping Co.	~

In the demonstration prepared, the second link in the supply chain is the company DistriBrand Co. In order to perform order picking, click Create order. A blue panel and a list of goods available will be unlocked. To continue order picking, first select goods you want to send to the client from the list. The process is carried out individually, i.e. you select the product type you want to add to your shipment from the drop-down list in the right-hand side panel.



Default data make it possible to select from 4 available products and an additional option described as ***EmptySSCC***. Selection of each product automatically causes the list of pallets in which a given product can be found to appear in the window below. Since, for demonstration purposes, all implemented pallets are homogenous, every time you will only see one available pallet.



Portable Demo enables order picking to be carried out in two basic modes: order picking based on whole homogenous pallets or/and by simultaneous picking of an empty SSCC pallet. For the purposes of this demonstration, an entry of the SSCC number has been placed in the database, without collective packaging assigned to it. In other words, an empty pallet with the number SSCC has been prepared.

Order picking is carried out by dragging and dropping, i.e. manually moving logistic units from the right-hand side panel to the left-hand side one.



On the basis of this principle, order picking has been carried out by moving two homogenous pallets and additionally filling an empty pallet by moving 6 collective packaging onto it (3 packets of each product). Order picking is completed by clicking Finalize. Once the process is accepted, the view automatically changes to EPCIS/Middleware.

V= MMG Co Manufacturer - Portable Demo		
(••) Run virtual reader 🔰 🔊 Capture reader 🦇 Resolving ((EPCIS) 🔹 🖓 Compare with order 💆 Accep	止 智
Order properties Type Data Order Order number Order date 20 grudnia 2007 DESADV number 109144 DESADV date 20 grudnia 2007 Middleware ■	Physical stock check	Order picking Pinventory EEEPCIS/Middleware
	Item properties (from EPCIS)	Ē
	Type Data	

Since the system enables virtually unlimited expansion of the supply chain and makes it possible to use physical readers (in any configuration, e.g. five participants of the supply chain and only one physical reader), it is necessary to inform the server which user is using the reader at a given moment. In order to assign a reader to your own business location, it is thus necessary to click Capture reader. Only then will it be possible to actually do the correct readout. In the presentation, reading of the prepared pallets will be carried out using a virtual reader. A reader is activated by clicking "Run virtual reader" on the bar below the animation window.

(••) Run virtual reader | 👌 Capture reader 🚧 Resolving (EPCIS) 👻

🔡 Compare with order 🏼 🐉 Accept

The reader window should look as follows:



We thus see, in the warehouse, three pallets prepared for shipment: two homogeneous pallets and one mixed pallet. The readout takes place by physically moving pallets through the RFID gate using the mouse. At the same time, a small semi-transparent window shows the numbers SSCC and SGTIN of the goods read.

Middleware events	×
lum:epc:id:sglin:5900000.055510.458 um:epc:id:sglin:5900000.055510.458 um:epc:id:sglin:5900000.055513.758 um:epc:id:sglin:5900000.055510.458 um:epc:id:sglin:5900000.0400000014 um:epc:id:sglin:5900000.055513.758	

A read-out is regarded as completed if all pallets have been moved beyond the warehouse and the list of EPC numbers read is complete.



Having completed the readout, close the reader window. All numbers read also appeared in the lefthand side panel of the programme.

NE MMG Co Manufacturer - Portable Demo		
Delivery area		00
(••) Run virtual reader 🔰 👌 Capture reader 🐳 Resolving	(EPCIS) •	🔮 Compare with order 🏼 🔮 Accept
Order properties	Physical stock check	Or de
Type Data 🔼		pio
Order		
Order number 94228//ILIM//07		
DESADV number 109144		
DESADV date 20 grudnia 2007		Inve
Middleware		antor .
EPC.Identyfier Bead t		×
umrendidisatin:5900000.055510.4 200712 :		111
um:epc:id:sglin:5900000.055513.7 200712 1		2
• um:epc:id:sgtin:5900000.055510.4 200712 2		14
urn:epc:id:sgtin:5900000.055513.7 200712 2		1id
urn:epc:id:sgtin:5900000.055510.4 200712 2		lewa
urn:epc:id:sscc:5900000.0400000 200712 2		
urn:epc:id:sgtin:5900000.055513.7 200712 2		
urn:epc:id:sgtin:5900000.055511.5 200712 2		
urn:epc:id:sgtin:5900000.055511.5 200712 2	Item properties (from EPCIS)	
urn:epc:id:sscc:5900000.0400000 200712 2	nom propentes (nom EP CI3)	
• urn:epc:id:sgtin:5900000.055511.5 200712 2	Type Data	
• urn:epc:id:sgtin:5900000.055511.5 200712 2		
urn:epc:id:sscc:5900000.0400000 200712 2		
	L	

In the real world, the process of reading RFID tags when they are moved through the gate, can virtually complete goods shipment. In the case under consideration, due to some restrictions and the need to use one programme, common for all three types of users, it is necessary to "manually" verify EPC numbers read and to enter descriptions related to the goods sent to the EPCIS server. The process is effected by clicking "Resolving (EPCIS)". The function can operate in two modes: manual and automatic. Manual operation causes the goods shipped to be verified and descriptions to be added to the EPCIS server individually (each logistic unit separately). Automatic operation, in turn, enables all goods to be verified simultaneously. You can select from two speeds of automatic operation - slow and fast. The verification makes it possible to find out whether all EPC numbers have been read. EPC numbers verified correctly are marked green. An incorrect or missing readout is depicted in red.

🖩 MMG Co Manufacturer - Portable Demo 📃 🗖 🗙					
Delivery area		00			
(••) Run virtual reader 🔰 👌 Capture reader 🐳 Resolving	I (EPCIS) 🔹	😰 Compare with order 🏾 🛃 Accept			
Order properties		Physical stock check			
Type Data		□ □ • • • um:epc:id:sscc:5900000.0400000014			
Order		- 👰 urn:epc:id:sgtin:5900000.055510.458620			
Order number 94228//ILIM//07		um:epc:id:sgtm:5900000.055510.458621			
DESADV number 109144		um:epc:id:sgtin:5900000.055510.458622			
DESADV date 20 grudnia 2007		um.epc.id:sgtin:5300000.055513.758620			
		um encid satio 590000,05513,758622			
Middleware		arr.epc.id.sgan.5500000.055313.750022			
EPC Identyfier Read time	Record time Read	an up::epc:id:satin:590000.055511.558620			
Image: Provide the second	20071220100614 Dock	- 🍈 um:epc:id:sgtin:5900000.055511.558621			
Image: Provide the second	20071220100615 Dock	🚽 💮 urm:epc:id:sgtin:5900000.055511.558622			
	20071220100615 Dock	urn:epc:id:sgtin:5900000.055511.558623			
Image: Provide the second	20071220100616 Dock	📄 🕘 um:epc:id:sscc:5900000.0400000012			
	20071220100616 Dock	um:epc:id:sgtin:5900000.055512.658620			
♥ urn:epc:id:sscc:5900000.0400000	20071220100617 Dock	um:epc:id:sgtin:5900000.055512.658621			
Purn:epc:id:sgtin:5900000.055513.7 20071220100617	20071220100617 Dock	um:epc:id:sgtin:5900000.055512.658622			
♥ urn:epc:id:sgtin:5900000.055511.5 20071220100613	20071220100618 Dock	um:epc:id:sgtin:5900000.055512.658623			
yum:epc:id:sgtin:5900000.055511.5 20071220100610	20071220100619 Dock	Item properties (from EPCIS)			
♥ um:epc:id:sscc:5900000.0400000 20071220100619	20071220100619 Dock				
vrn:epc:id:sgtin:5900000.055511.5 20071220100616	20071220100620 Dock	Type Data			
vrn:epc:id:sgtin:5900000.055511.5 20071220100613	200/1220100620 Dock				
♥ um:epc:id:sscc:5900000.0400000	200/1220100622 Dock				

The last action to be performed is to approve the shipment by clicking "Accept". The following message will appear simultaneously on the distributor's (DistriBrand Co.) PC:



The message informs you that the batch of goods sent from the first location has already reached its destination and acceptance of the delivery may follow. Further stages of the process virtually involve repeating the actions performed at the manufacturer's location. The first step is the need to change the view to "EPCIS/Middleware" and to take the control over the reader by clicking "Capture reader". The next step is to run the virtual reader and transport the pallets received through the gate.



Analogously, EPC numbers read appear in the "Middleware" preview window.

EPC Identyfier	Read t	Recor	Read point
urn:epc:id:sgtin:5900000.055511.5	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055511.5	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055511.5	200711	200711	Dock 1
urn:epc:id:sscc:5900000.0400000	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055511.5	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055512.6	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055512.6	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055512.6	200711	200711	Dock 1
urn:epc:id:sscc:5900000.0400000	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055512.6	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055513.7	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055510.4	200711	200711	Dock 1
urn:epc:id:sscc:5900000.0400000	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055510.4	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055513.7	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055510.4	200711	200711	Dock 1
urn:epc:id:sgtin:5900000.055513.7	200711	200711	Dock 1

Clicking the "Resolving (EPCIS)" button is tantamount to verifying whether the readouts are correct and downloading descriptions of goods from the manufacturer's EPCIS server, which is visualised in detail in the animation accompanying this process.

🕬 DistriBrand Co Distributor - Portable Demo		
((•) Run virtual reader 🔰 🛐 Capture reader 🐝 Resolving	(EPCIS) 👻	🛂 Compare with order 🏾 🛃 Accept 📳
Order properties Type Data Order number 07//15034//88//ILIM Order number 20 grudnia 2007 DESADV number 109144 DESADV date 20 grudnia 2007 Middleware EPC1dentyfier Percentid sgtin: 5900000 055511.5 200712 * urrepcid: sgtin: 5900000 055512.6 200712 * urrepcid: sgtin: 5900000 055513.7 200712 * urrepcid: sgtin: 5900000 055513.7 200712 * urrepcid: sgtin: 59000000 055513.7 200712 <td>Physical stock check umrepcid sgin:5900000.0400000011 umrepcid sgin:5900000.055511.558620 umrepcid sgin:5900000.055511.558621 umrepcid sgin:5900000.055511.558621 umrepcid sgin:5900000.055511.558623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658620 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055510.458620 umrepcid sgin:5900000.055510.458621 umrepcid sgin:5900000.055510.458622 umrepcid sgin:5900000.055513.758621 umrepcid sgin:5900000.055513.758621 umrepcid sgin:5900000.055513.758622 umrepcid sgin:5900000.055513.758622 umrepcid sgin:5900000.055513.758622 umrepcid sgin:5900000.055513.758622</td> <td>order poling</td>	Physical stock check umrepcid sgin:5900000.0400000011 umrepcid sgin:5900000.055511.558620 umrepcid sgin:5900000.055511.558621 umrepcid sgin:5900000.055511.558621 umrepcid sgin:5900000.055511.558623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658620 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055512.658623 umrepcid sgin:5900000.055510.458620 umrepcid sgin:5900000.055510.458621 umrepcid sgin:5900000.055510.458622 umrepcid sgin:5900000.055513.758621 umrepcid sgin:5900000.055513.758621 umrepcid sgin:5900000.055513.758622 umrepcid sgin:5900000.055513.758622 umrepcid sgin:5900000.055513.758622 umrepcid sgin:5900000.055513.758622	order poling

The last step is the actual acceptance of the delivery by clicking "Accept". If the acceptance is approved, the view will automatically change to "Inventory".

DistriBrand Co Distributor - Distributor -	PORTABLE DEMO	
User properties Type Data GLN Portable demo actor Distrit GLN number 59095 Name Distrit Postal code 71.00 City Wrocl Country Polan VAT number 900-0	Inventory Inventory	Sh Order picking 🥵 Inventory 🔛 EPCTS/Mddleware

All goods which have previously been sent by the manufacturer appear in our warehouse.

The subsequent stages of the presentation involve:

- preparing shipment for the client,
- shipment,
- acceptance of the goods on the part of the client.

All those processes are carried out based on the principles presented above.

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Appendix A: Programming RFID Tags using CAEN A948EU reader

A CAEN reader is accompanied by an installation CD with software and technical documentation. Having inserted the CD into the drive, install *CAEN RFID Demo*. The Installer will send shortcuts to the following three applications to the desktop:

- CAEN RFID Java Demo
- CAEN RFID Show
- CAEN RFIDTest

Programming RFID tags is possible both using *CAEN RFID Java Demo* and *CAEN RFID Show*. Given that *CAEN RFID Show* seems to be easier to handle, the below description of RFID tag programming will be presented based on the use of this application.

Once you have started the programme, the following view appears:

CAEN RFID Show	
Start Acquisition	
Enable Beep	
Read Data	
Write Data	

In order to start working with the programme, first connect to the CAEN reader. Use the command *Connect* in the *File* menu.

You can connect to the reader based on communication via the local network (TCP/IP) or the PC communication ports (RS232).

If the RS232 communication port is used, select RS232 Connection reference from the drop-down menu and enter the name of the communication port (e.g. COM1, COM2, etc.) in the RS232 Port field. If you use Etherner connection, you must select TCP/IP Connection reference and enter the reader IP address in the TCP/IP Address field (default IP: 192.168.0.125). Another step is to select the communication protocol for the reader and the RFID tags read. To do this, select:

Settings >> SetProtocol >> Multiprotocol

Such a setting enables any RFID tags to be read irrespective of the standard of their performance.

Securitys Mavariced				
	((=))(G/			
		ART OF IDENTIFICATIO	П	
	Statistic	E00400009CD7FC01	11	Ant0
	Acc/Sec 0.00	300833B2DDD9048035050000	11	Ant0
	T IS	300833B2DDD9014035050000	11	Ant0
Start Acquisition	Tags/Sec 0,00	30940425C4C1967400004E9C	11	Ant0
	Efficiency 0,00%	A1A050804A125941AA020101	11	Ant0
		30940425C4C1967400004E6C	11	Ant0
Enable Been	Protocols Details	123456789123456789012350	11	Ant0
Encore beep		30940425C4C1967400004E7C	11	Ant0
	ISO 18000_6B 1	30940425C4C1967400004E8C	11	Ant0
		A1A050804A125943AA020801	11	Ant0
Read Data	EPC 1.19 0	30940425C4C1967400004E2C	11	Ant0
CH I	EPC Class1Gen1 0	2		
Write Data	EPC Class1Gen2 10			

Start Acquisition causes all RFID tags in the readout field to become visible in the right-hand side panel. In order to check whether their tags are correct, the manufacturers save an individual number in them and then check whether it has been read correctly. In practice, even new EPC Gen2 labels will have a 96-bit number in their memory which can easily be replaced with a different one using the programme described. To this end, select the number you wish to replace with your own from the list on the right-hand side.

E00400009CD7FC01	11	Ant0	
300833B2DDD9048035050000	11	Ant0	
300833B2DDD9014035050000	11	Ant0	
30940425C4C1967400004E9C	11	Ant0	
A1A050804A125941AA020101	11	Ant0	
30940425C4C1967400004E6C	11	Ant0	
123456789123456789012350	11	Ant0	
30940425C4C1967400004E7C	11	Ant0	
30940425C4C1967400004E8C	11	Ant0	
A1A050804A125943AA020801	11	Ant0	
30940425C4C1967400004E2C	11	Ant0	

Once you have made your selection, click Read Data, as a result of which a field with the read number will appear in the bottom part of the window.

(
	Statistic	E00400009CD7FC01	11	Ant0
	Aca/Sec 0.00	300833B2DDD9048035050000	11	Ant0
	The	300833B2DDD9014035050000	11	Ant0
Start Acquisition	Tags/Sec 0.00	30940425C4C1967400004E9C	11	Ant0
	Efficiency 0,00%	A1A050804A125941AA020101	11	Ant0
		30940425C4C1967400004E6C	11	Ant0
Enable Been	Protocols Details	123456789123456789012350	11	Ant0
спаре реер		30940425C4C1967400004E7C	11	Ant0
	ISO 18000_6B 1	30940425C4C1967400004E8C	11	Ant0
		A1A050804A125943AA020801	11	Ant0
Read Data	EPC 1.19 0	30940425C4C1967400004E2C	11	Ant0
< 10 m	EPC Class1Gen1 0			
Write Data	EPC Class1Gen2 10			

In the case under consideration the last digit of the number read has been changed.

300833B2DDD9048035050001

The change is approved and saved in the memory of this RFID tag by clicking write Data. This is confirmed by another run of the Start Acquisition function.

E00400009CD7FC01	10	Ant0
300833B2DDD9014035050000	10	Ant0
30940425C4C1967400004E2C	8	Ant0
30940425C4C1967400004E6C	10	Ant0
30940425C4C1967400004E8C	10	Ant0
300833B2DDD9048035050001	10	Ant0
123456789123456789012350	10	Ant0
A1A050804A125943AA020801	9	Ant0
A1A050804A125941AA020101	8	Ant0
30940425C4C1967400004E7C	10	Ant0
30940425C4C1967400004E9C	8	Ant0

Programming RFID tags using CAEN RFID Java Demo takes place in an analogous fashion to the one described above.

Appendix B: Programming RFID EPC Gen2 tags using SAMSys MP9320 v2.8e reader

The SAMSys RF Command Suite is a Microsoft Windows application that provides a Graphical User Interface (GUI) for SAMSys RFID Reader Products. RF Command Suite can communicate with all SAMSys readers through the Ethernet (TCP/IP) port or the RS-232 serial port. After startup, the Command interface is displayed. As shown in the figure, this interface provides a command line for sending CHUMP (Comprehensive Heuristic Unified Messaging Protocol) commands to a reader and a log window to view all data received from the reader.

3	🕼 SAMSys RF Command Suite - v1.0.18						
File Reader Connection Help							
	Command	Tag Summary	Upload File	Error Log	RFCS Config	Reader Config	
E	inter a command or select	a command from the history	list:				
						_	
	Data		Date/Time			- Function Set	
						Auto Read	
						Polled Read	
	RF Off						
						Version	
						Registers	
	THE POWER TO CHOOSE						
		rito Log to Filo					
-							
Not	connected to Reader					View Error Log for Errors.	

Three CHUMP commands can be used to write to an EPC1, Gen2 tag: Wa, Wt, and Wv. Wa writes to any tag in the field and is typically used to write the EPC ID to tag. Wt writes to a specific tag, as defined in the input parameter list, and is typically used to write to user data on a tag. Wv is a multifunction command that erases, writes, and verifies a tag.

Using the Wa Command

The format of the **Wa** command is as follows:

```
}Wa,a:<blk addr>,b:<blk data>[,1:<# blks>][,s:<offset>]
```

[,f:<xxx>]!

where:

a:<blk addr> is the block address (0 by default). For EPC1, Gen2

0=Reserved,1=EPC, 2=TID, 3=USER memory bank

b:<blk data> is the block data to write. Must be a 16-word multiple.

l:<# blks> is the length in 16-bit words. Defaults to length of data if missing.

s:<offset> is the offset to start the write (EPC1, Gen2 only). Defaults to 0 if.

f:<xxx> is protocol specific flag data. Set f=1 for read back/verify. EPC1, Gen2 tags provide SUCCESS/FAIL feedback. Defaults to 0.

To write an EPC ID value of 332233445566778899aabbcc onto a tag with the Protocol Control field set for a 96 bit tag, enter:

}wa,a:1,s:2,b:332233445566778899aabbcc!

To add the length field, enter:

}wa,a:1,s:2,b:332233445566778899aabbcc,1:6!

To request a read/verify cycle following the write operation, enter:

}wa,a:1,s:2,b:332233445566778899aabbcc,l:6,f:1!

In order to write an EPC ID to a blank tag, the Protocol Control bits must also be set. This can be accomplished in a single write command since the Protocol Control bits are contained in the same memory bank as the EPC ID. Following the previous example, the command would include setting the Protocol Control to 3000 as follows:

}wa,a:1,s:1,b:3000332233445566778899aabbcc!

The Kill and Access Passwords are contained in the Reserved Memory bank. Each password can be written with separate **Wa** commands or a single command:

To write a 32-bit Access password at offset 2, enter:

}wa,a:0,s:2,b:55667788!

To write both Access passwords with a single command, enter:

}wa,a:0,b:3322334455667788!

Using the Wt Command

The Wt command can also be used to write the Kill and Access passwords and the TID and User Memory banks. The Wt command requires the use of the EPC ID of the tag. The format of the Wt command is as follows:

```
}Wt, b:<data> ,d:<tag id> a:<block address >[,l:<length>]
[,s:<offset>][, f:<flags>]!
```

where:

a:<block address> is the block address (0 by default). For EPC1, Gen2

0=Reserved,1=EPC, 2=TID, 3=USER memory bank

b:<blk data> is the block data to write. Must be a 16-word multiple.

d:<tag ID> is the tag identification.

l:<# blks> is the length in 16-bit words. Defaults to length of data if missing.

s:<offset> is the offset to start write (EPC1, Gen2 only). Defaults to 0 if missing.

f:<xxx> is protocol specific flag data. Set f=1 for read back/verify. EPC1, Gen2 tags provide SUCCESS/FAIL feedback. Defaults to 0.

To write the Kill password to a tag with EPC ID= 332233445566778899aabbcc, enter: }wt,d:332233445566778899aabbcc,a:0,b:33223344!

Using the Wv Command

The Wv command is a multifunction command that performs any erase, write, and verification needed to program a tag in a specific protocol. The command can also lock the data.

The format of the \mathbf{Wv} command is as follows:

```
}Wv,b:<EPC data>,k:<kill code>,c:<access code>,
```

```
i:<TID data>,u:<user memory>,m:<lock mask>!
```

```
where:
```

b:<EPC data> is the EPC ID to write to the tag.

k:<kill code> is the kill code to be written to the reader.

c:< access code> is the access code to be written to the tag.

i:<TID data> is the TID data to be written to the tag. The number of bytes varies depending on the tag.

u:<user memory> is the user data to be written to the tag. The number of bytes varies depending on the tag.

m:<lock mask> is the lock mask to indicate which tag field to lock. Each 4-bit nibble in the mask indicates the lock state to apply to a specific part of the tag. A mask nibble value of 1 locks the specific part of the tag. A mask nibble value of 0 indicates no lock is applied. For the EPC1-2, the low order bit of each nibble indicates if the permalock bit should be set, and the next higher bit indicates if the pwd-write bit should be set. For the EPC1-2 protocol, the mask nibbles apply to the following fields:

Mask Nibble	4	3	2	1	0
Tag Field	User memory	TID data	Access code	Kill code	EPC data

To write an EPC ID value of 332233445566778899aabbcc and verify the write, enter:

}wv,b:332233445566778899aabbcc!

To write the EPC data, a kill code of A391742F, an access code of 73D97412, and lock the EPC data and access code, enter:

}wv,b:30112233445566778899aabb,k:A391742F,c:73D97412,m:00202!

In this example, the lock mask of $m: 00202 = 0010\ 0000\ 0010b$ and indicates that a pwd-lock is requested for nibble 2 (access code) and a pwd-lock is requested for nibble 0 (EPC data).

No	Problem	Possible causes	Solutions
1	<i>Portable Demo</i> client cannot connect to server	Computers within the network do not belong to the same working group	You should set the same working group for all computers within the local network
2	Portable Demo client cannot connect to server	Some computers have authorisation settings at the domain level	You should share a database folder using the mapping of the network disc and indicate it in the server programme. Network computers should be logged onto the server using: <i>Start>>Run>>\\A.B.C.D</i> where <i>A.B.C.D</i> is the IP address of the server. Warning! When logging onto the server, you must specify user login and password. The process of mapping the network disc is described in the Windows Help.
3	Portable Demo client cannot connect to server	Problem reading PDData.mdb database file due to error in the default template or lack of network connection.	Make sure your network connection is functional. Using the server function: <i>Database>>Reset database to template</i> reset the database template and restart your server and try to make the connection again.
4	Portable Demo client cannot connect to server	Problem reading the PDData.mdb database file due to system error.	Restart the server and try to make the connection again.
5	<i>Portable Demo</i> client cannot connect to server	Unknown problem with network configuration.	Contact your local IT department to properly configure your network connection.
6	<i>Portable Demo</i> server generates a system error and shuts down	Problem of programme compatibility with other software installed in Windows.	Restart your computer and try to run server application again. In the case of failure it may be necessary to reinstall Windows system.
7	<i>Portable Demo</i> client generates a system error and shuts down.	Problem of programme compatibility with other software installed in Windows.	Restart your computer and try to run server and client application again. In the case of failure it may be necessary to reinstall Windows system.
8	Other errors	Unknown causes.	Send information on the error detected including a detailed error description to the following e-mail address: demo@bridge-project.eu

Appendix C: Troubleshooting