



invensys.
Wonderware



Wireless solutions over Cellular network for Wonderware

Janne Suhonen
Product Manager
Klinkmann



Cellular (mobile) network based automation – good business opportunity



Business opportunities

- new WW applications
- upgrade to existing WW installations
- for alarm handling, metering, maintenance, data collecting, fleet management...

Applications

- industrial, utilities and building automation
- automatic meter reading
- device monitoring and maintenance (point of sales, vending machines...)
- authority reporting (water level, food storage temperature, swimming pool monitoring...)
- vehicle, traffic, railway automation
- many others



Three basic wireless solutions



Klinkmann can propose three basic wireless solutions for cellular network:

- 1. “GSM-Control”:** Text-message solution, by using GSM-Control “standalone” or “Application Object” version
- 2. “GPRS-Control”:** by using I/O GPRS Server and PLCs with GPRS-modem connected to each PLC
- 3. “3G-Control”:** by using 3G-modems and industrial routers and 3G-Client and 3G-Server software



Mobile/cellular network services, communication types



TEXT MESSAGES, (= SMS, Short Message Service)

- the most widely used cellular network data service in the world !!
- standard transparent operator service, easy to estimate costs (also internationally)
- one message is max 160 char. (enough in most remote applications)
- > good alternative in small/medium and several large applications

GPRS and 3G (UMTS)

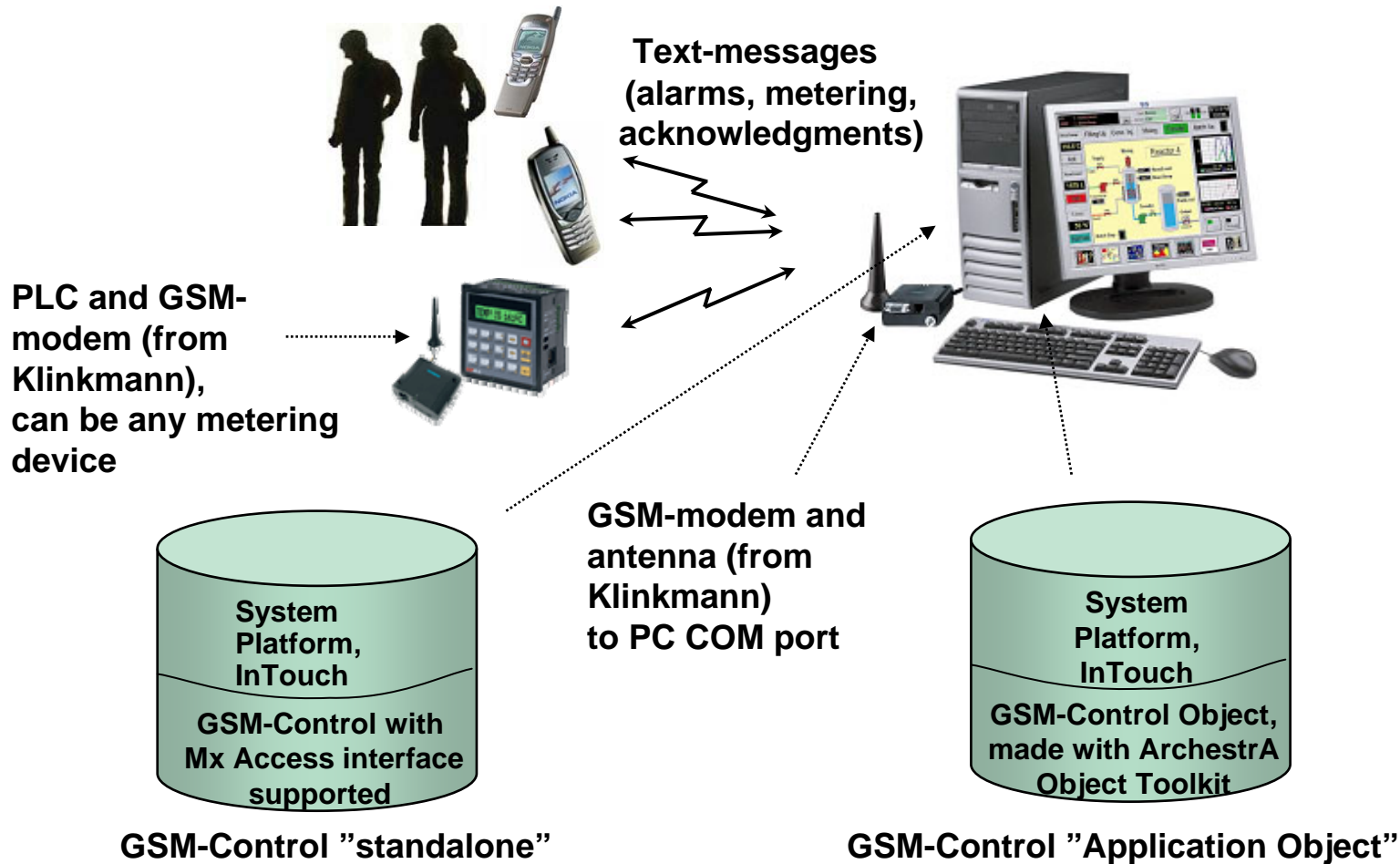
- TCP/IP type data communication
- GPRS is expansion to standard GSM-network, real speed a. 30-50k
- 3G/UMTS is a new network, real speed a. 200-300k
- operator specific service; cost control more difficult
- > good alternative only in large applications



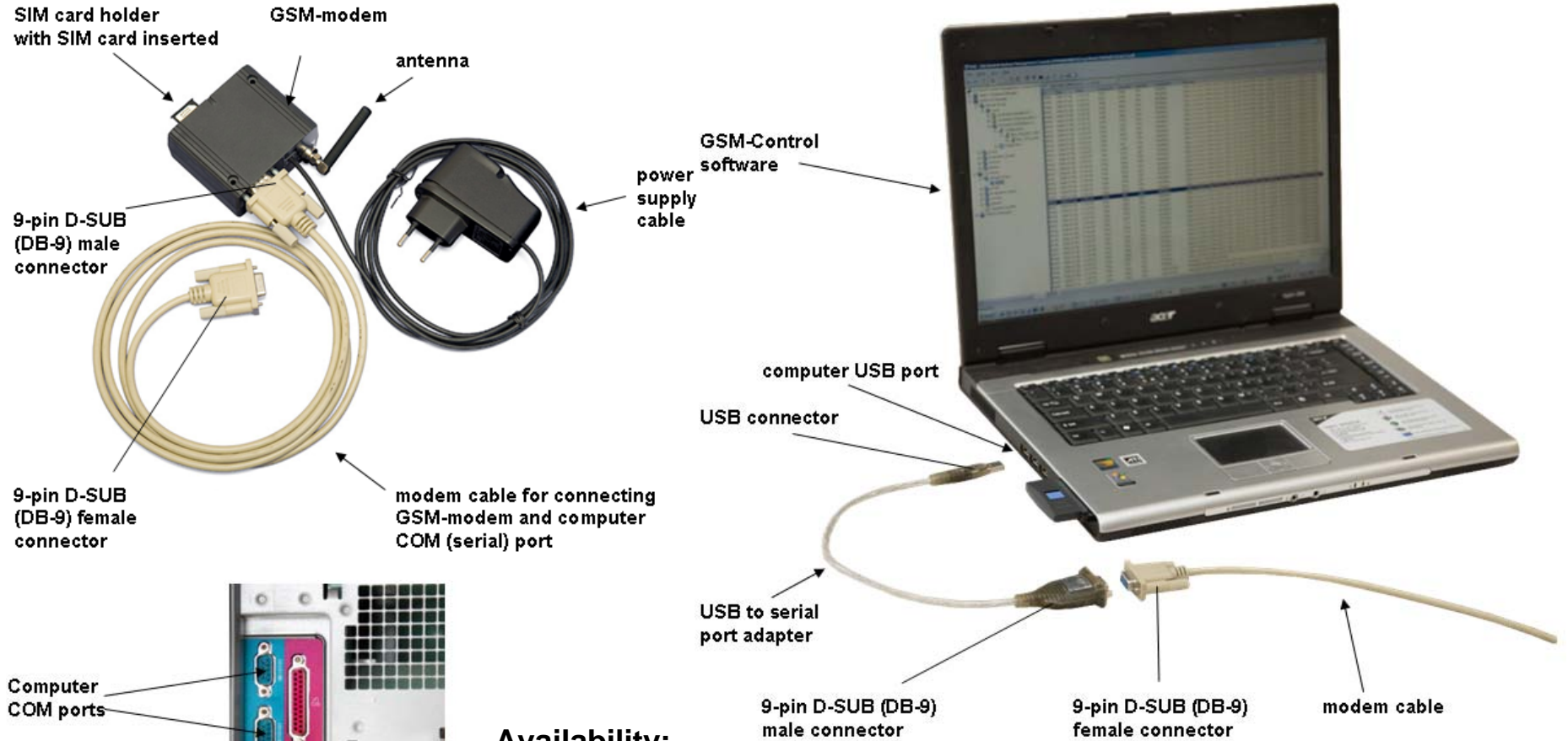
GSM-Control, Text Messages



1. Text messaging solution, by using GSM-Control



GSM-Control set-up



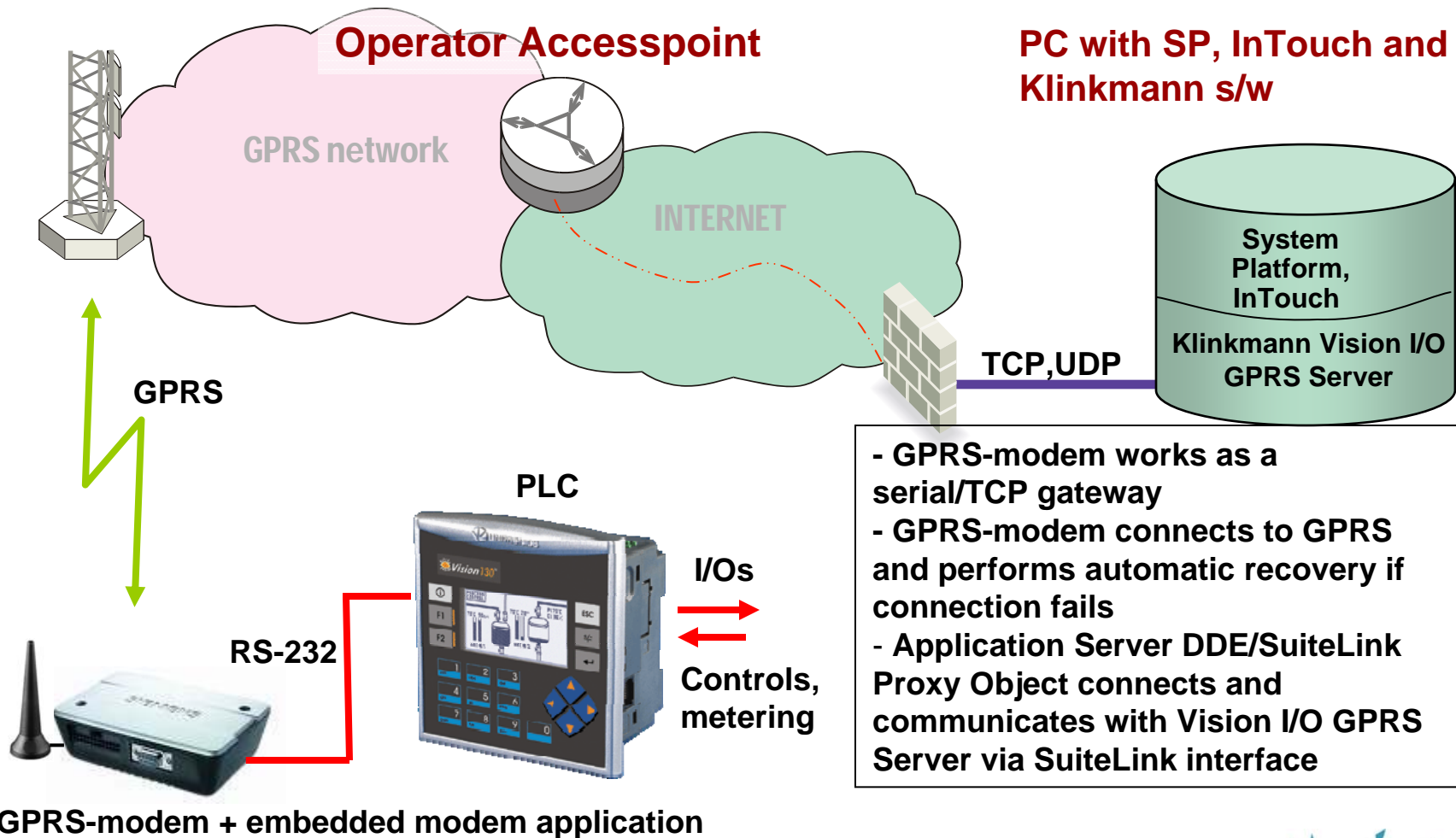
Availability:

- Klinkmann: GSM-Control software, modem, antenna, cables, etc.
- Local operator: SIM card (ask also special priced M2M and data SIM cards/services)



GPRS-Control and 3G-Control

2. GPRS solution (TCP/IP): Klinkmann I/O GPRS Server and GPRS-modem connected to PLC as an example



3G-Control concept is similar as GPRS-Control, but supports higher data speeds, as 3G network has new infrastructure and new 3G-modems and routers are used

GSM-Control “standalone” details



3. GSM-Control “standalone” and Application Server, details

Wonderware Mx Access (Lmx Proxy) interface to Application Server support is added to GSM-Control (Text messages communication management s/w) additionally to existing DDE, OPC and SQL interfaces.

Galaxy Node and **Galaxy Name** parameters are used only by GSMCFG to browse Galaxy items. **Galaxy Node** specifies the Galaxy repository node, **Galaxy Name** is the name of Galaxy. Those parameters are not used by GSMCTRL because only one galaxy can be deployed at the time and GSMCTRL must run on the one of IAS Galaxy nodes in purpose to access the LMX data. The pressing of **List** button enumerates galaxies for Galaxy Node and fills the Galaxy Name combo box.

The screenshot shows a "Settings" dialog box with a blue title bar and a close button (X). The dialog is divided into two main sections. The top section contains two text input fields: "GSM Service Center Phone Number" with the value "+358405202000" and "PIN Code" with the value "0000". To the right of these fields are "OK" and "Cancel" buttons. The bottom section contains a "Galaxy Node" field with the value "localhost" and a "List" button to its right. Below this is a "Galaxy Name" dropdown menu. Further down are three more text input fields: "LMX Client Name" with the value "GSMCTRL_LMX_Client", "LMX User" with the value "Administrator", and "LMX Password" which is currently empty.

LMX Client Name parameter can be any unique string. This parameter identifies LMX connection to the IAS and is used internally by IAS.

LMX User and **LMX Password** parameters specify the username and password of GSMCTRL connection, in case the security is enabled on the Galaxy.

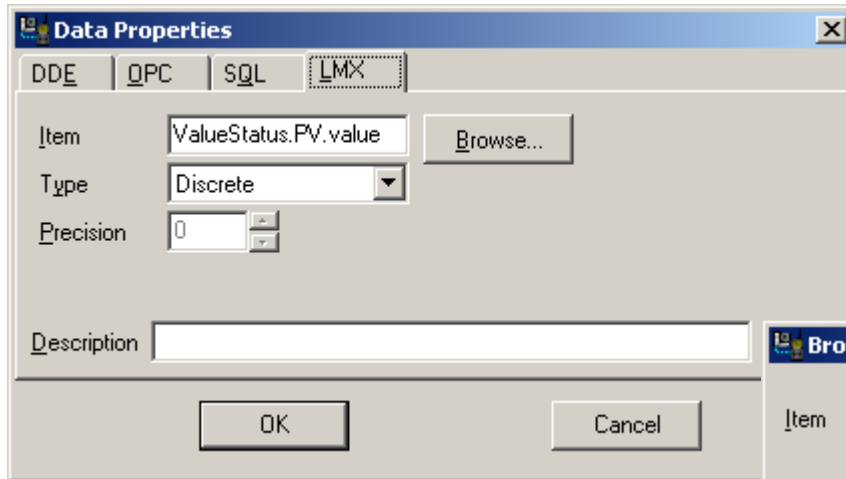


GSM-Control “standalone” details



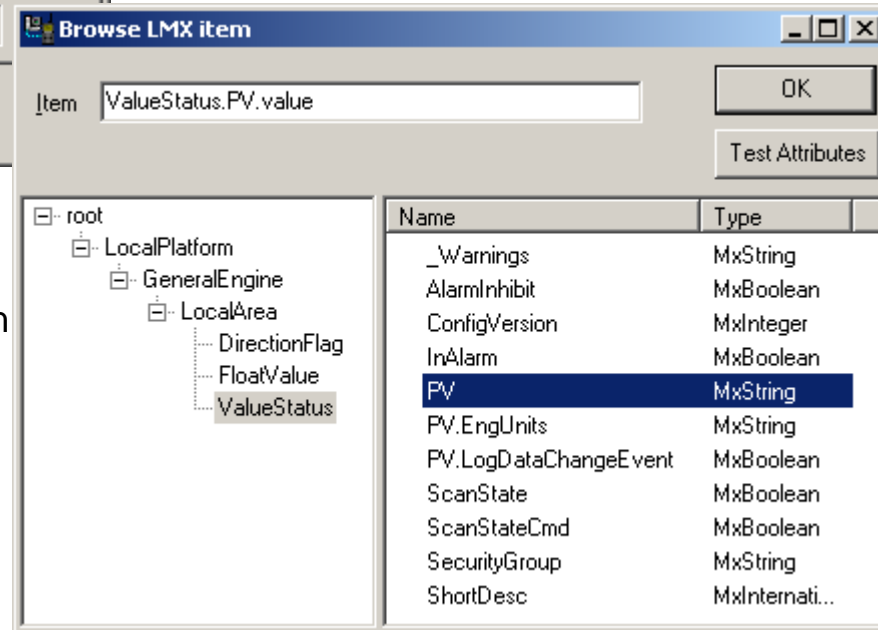
3. GSM-Control “standalone” and Application Server, details - 2

LMX data source page is added to GSMCFG “Data Properties” page:



“Item” field contains IAS Object and attribute name. The name can be obtained by clicking on **Browse...** button and selecting from the list of IAS items available on “**Browse LMX item**” dialog box.

Browsing of items uses Wonderware GRAccess interface, designed to allow programmatic access to the IAS configuration environment. Any item from any galaxy can be browsed, while runtime can access only items from the currently deployed galaxy:



GPRS-Control, basics



4. I/O GPRS Server, basics



Ethernet (server mode) Local IP Port: 100
ID String: #1 CR
Protocol: TCP PCOM
Remote Client IP Address: 0.0.0.0

Ethernet (client mode) Remote IP Port: 100
Remote IP Address: 127.0.0.1
Protocol: TCP PCOM
Retry Delay (sec): 5

No protocol
No protocol
TCP PCOM
TCP PCOM/IP
TCP MODBUS
TCP MODBUS/IP
TCP MODBUS/IP + LRC
UDP PCOM
UDP PCOM/IP
UDP MODBUS
UDP MODBUS/IP
UDP MODBUS/IP + LRC

- SuiteLink&DDE and OPC&DDE versions available
- developed by using Wonderware I/O ServersToolkit
- supports serial and Ethernet (TCP/UDP Client/Server) interfaces
- supports Modbus protocol (serial and Ethernet) – as Modbus Master can communicate with Unitronics PLCs as Modbus Slaves; automatic Unitronics/Modbus item naming/addressing conversion
- several types of PCOM and Modbus protocols can be selected
- widely tested with different types of GPRS-modems



Wireless application example



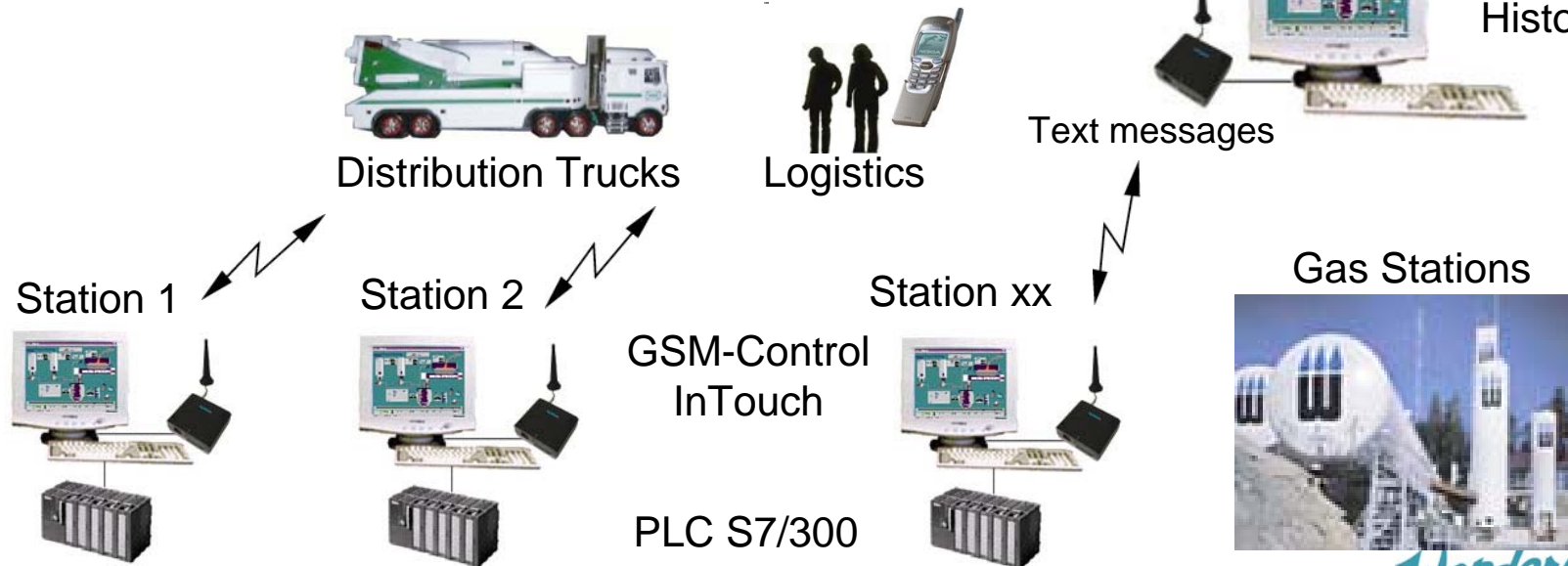
5. Wireless application: GSM-Control in Woikoski Gas

- gas stations connected with control center room via text messages with Klinkmann GSM-Control software
- text messages inform 2-way truck drivers and logistics
- one single Text messaging system handles all communication
- fast and low cost implementation
- whole project with ready packages incl. Excel



Control Center

GSM-Control InTouch& Historian



Wireless application example



6. Wireless application: GSM-Control in Finn-Power machine monitoring

- Finn-Power (Prima Industrie), Finland/Italy, supplies sheet metal working machines to global markets
- GSM-Control package is part of the machine delivery
- of single machines, text messages inform operational, capacity and service information locally and to the control center of the supplier
- allows fast alarm handling, real time capacity monitoring and predictive maintenance

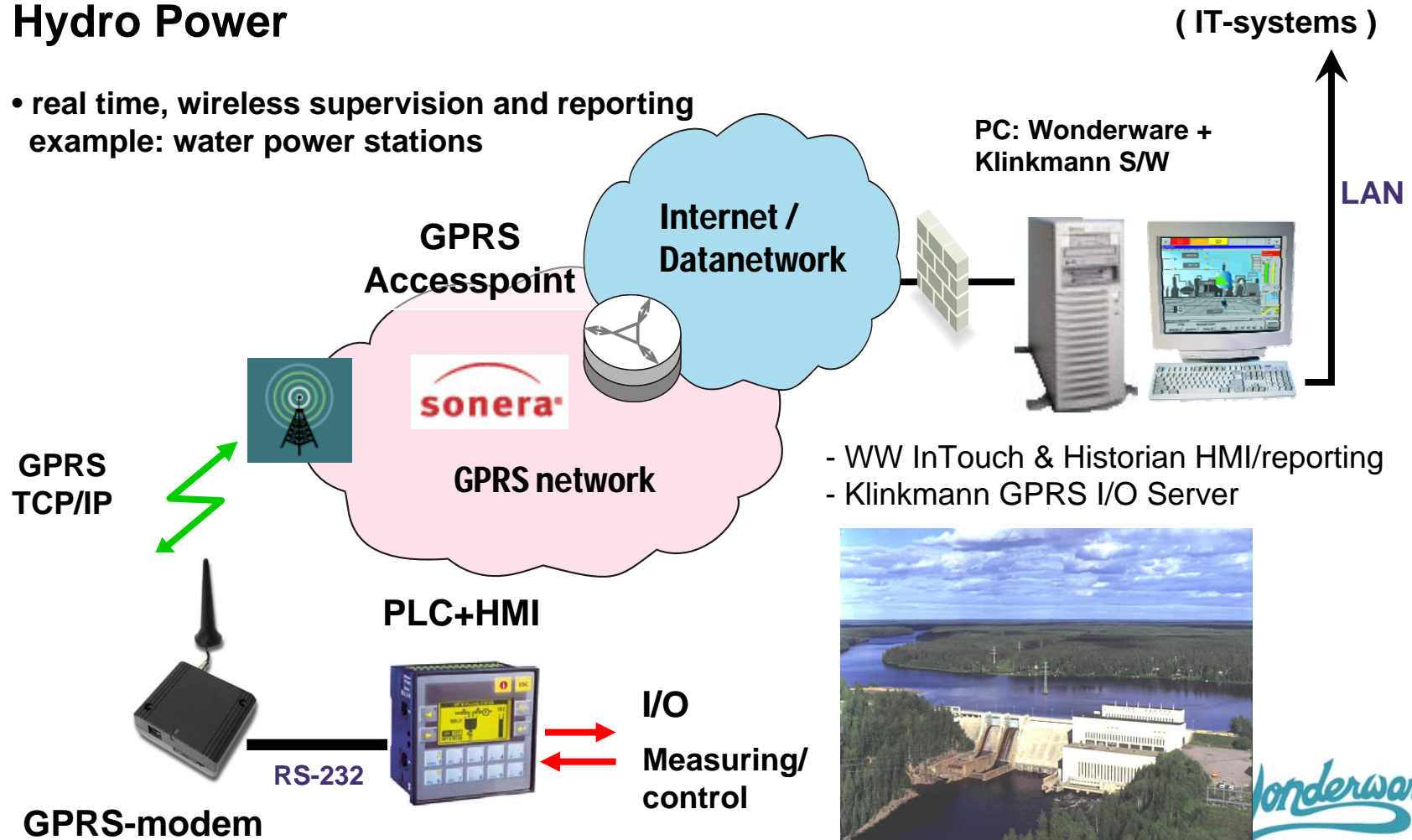


Wireless application example



7. Wireless application: GPRS-Control in Fortum Hydro Power

- real time, wireless supervision and reporting
example: water power stations



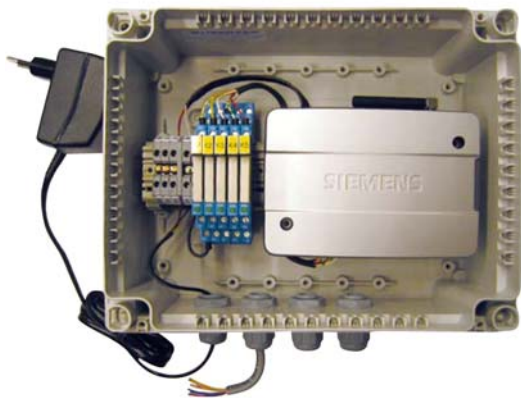
- WW InTouch & Historian HMI/reporting
- Klinkmann GPRS I/O Server



Text messages-operated control units and controllers



TCBox I/O-monitoring unit



- two way communication
- ready-to-install complete box solution
- for reading and switching I/O-status with text messages
- starting/stopping devices, sensor monitoring, etc. simple remote operations

JAZZ miniPLC+display



- two way communication
- independent PLC-controller, max 40 I/O
- Text message sending/receiving
- device controls, data collecting, etc. with free programming



Some general information



- Klinkmann develops cellular-network based wireless software since 1998
- Klinkmann software is used in over 60 countries worldwide, also by OEM customers
- well proven and easy-to-use, as the latest version is based on a lot of real customer feedback
- based on standard low cost GSM/GPRS modems and operators´ standard services; installation takes about 30 minutes
- all sales support material available: data sheets, manuals, demo software, reference stories etc.

Cellular network concepts from Klinkmann:

- “GSM-Control”: Text messages, easy to use message sending/receiving (ready)
- “GPRS-Control”: GPRS, TCP/IP real-time connections, speed about 50k (ready)
- “3G-Control”: UMTS 3G, TCP/IP real-time connections, speed about 300k (under development)

Wonderware is the primary interfacing platform for any Klinkmann wireless development.

Klinkmann is an independent Wonderware software distribution partner owning:

Wonderware
Finland&Baltics

Wonderware
Russia

Wonderware
Ukraine

Wonderware
Belarus





Thank You!

Software Solutions for Real-Time SuccessSM

**More information:
janne.suhonen@wonderware.fi
www.wonderware.fi**



080808/ob/wwwireless