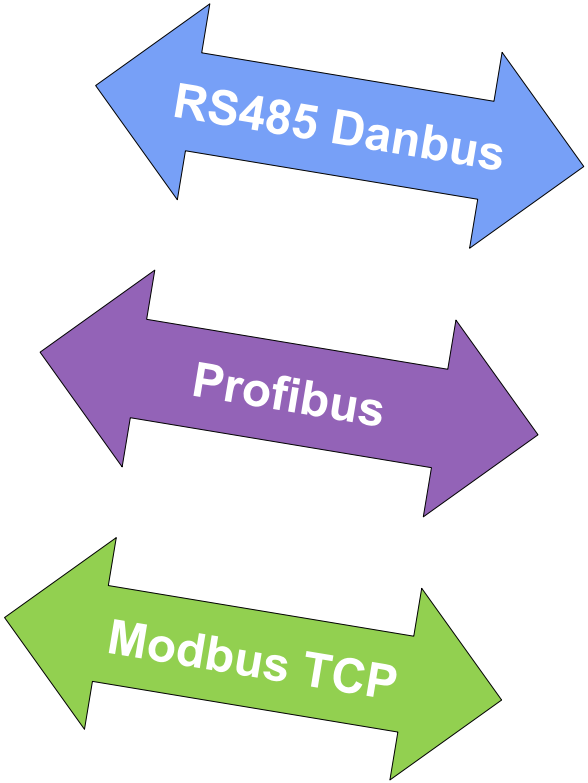
Unisab III communication options

Lars Pasgaard
Product Manager, Controls
Tel. +45 8736 7792
Mobile +45 2249 7774

Lars.Pasgaard@jci.com

Johnson Controls

Unisab III communication options



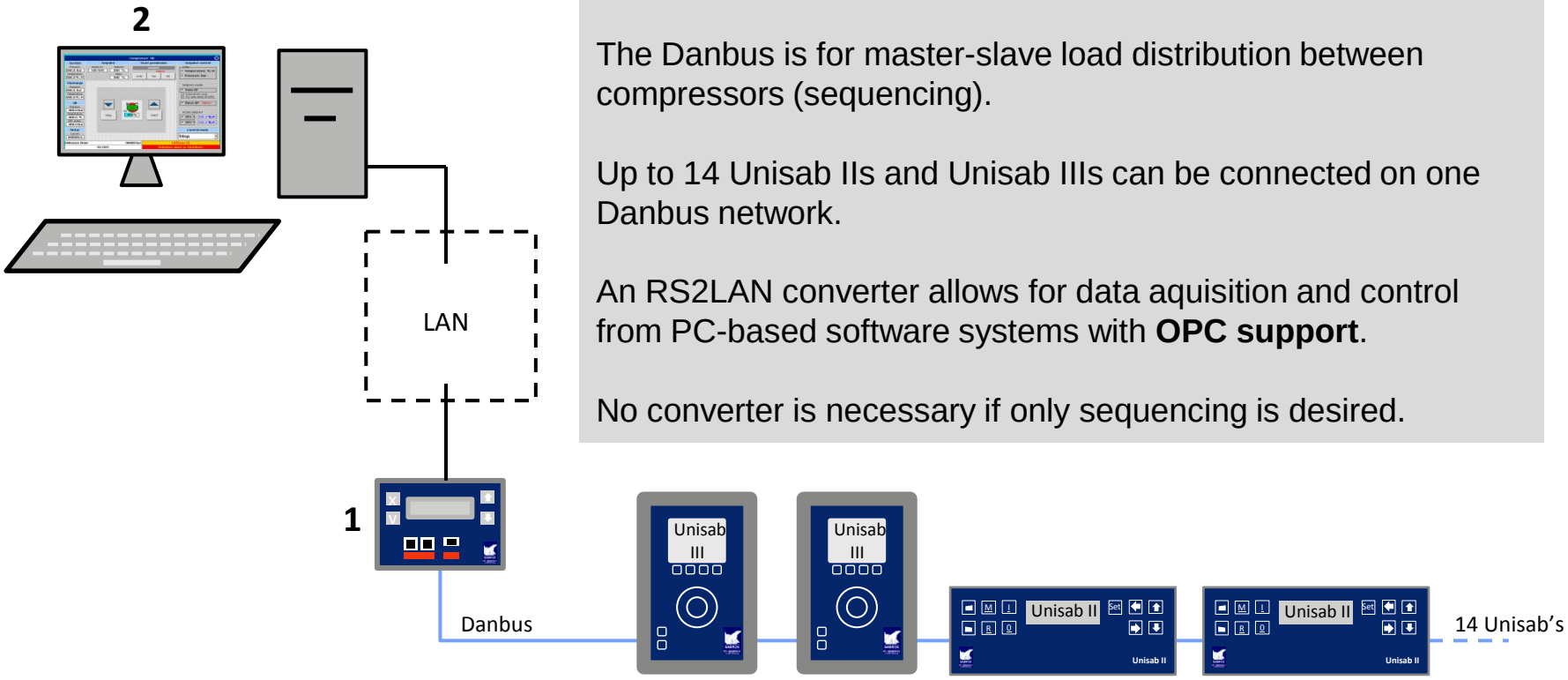
Three user interfaces for data communication
... and one for internal use (RS 485 for VSD remote control)

Danbus is reserved for load distribution (sequencing) in installations with up to 14 Unisab IIs and Unisab IIIs.
The Danbus interface can be used for communication with **PC-based monitoring systems** through an **RS2LAN converter** from Sabroe Factory. The RS2LAN converter is designed for **OPC communication** meaning, that OPC support in the PC based monitoring system is a **prerequisite**.
Danbus is based on RS485, which is an electrical standard for serial communication. RS485 utilizes 2-wire cable and **must** be daisy-chained according to specifications in the Unisab instruction (cable from Unisab to Unisab and so on). No converter is necessary if the Danbus is used only for sequencing.

Profibus is an industrial standard communication interface developed and directed by Siemens. However mainly used in Siemens environments, Profibus is also supported by most PLC makes. Profibus is normally used for **Interconnecting PLC equipment and peripheral controls** equipment from vendors of industrial controls equipment, such as Unisabs, VSD', valves, pumps, power meters, modular controllers etc.
Like Danbus Profibus is based on RS485, but cables and plugs have to be designed strictly according to Siemens' prescriptions. Siemens' own Profibus cable is known for its purple color. The Unisab III is ready for Profibus connection through plug D9. No additional converters necessary.

The **Ethernet** RJ45 plug is the interface for hooking up the Unisab to PCs, to the **Internet** and to Local Area Networks (**LANs**). The Ethernet interface is available for **Modbus TCP** communication to Building Management Systems (BMS) , PLCs and SCADA systems, for remote monitoring by means of **Sabroe SABHMI** freeware and for **email transmissions** in case of alarms and shutdowns.
Industrial Ethernet has been adopted from the world of administrative networks (LANs) to be the most predominant computer networking technology in industrial controls applications, substituting RS485 and other similar communication technologies.

Unisab III internet communication options
Danbus connection



1 ~ RS2LAN converter. Sabroe stock item.
2 ~ PC-based monitoring system – e.g. ISAC SCADA from Sabroe Controls or BMS systems

The Danbus is for master-slave load distribution between compressors (sequencing).

Up to 14 Unisab IIs and Unisab IIIs can be connected on one Danbus network.

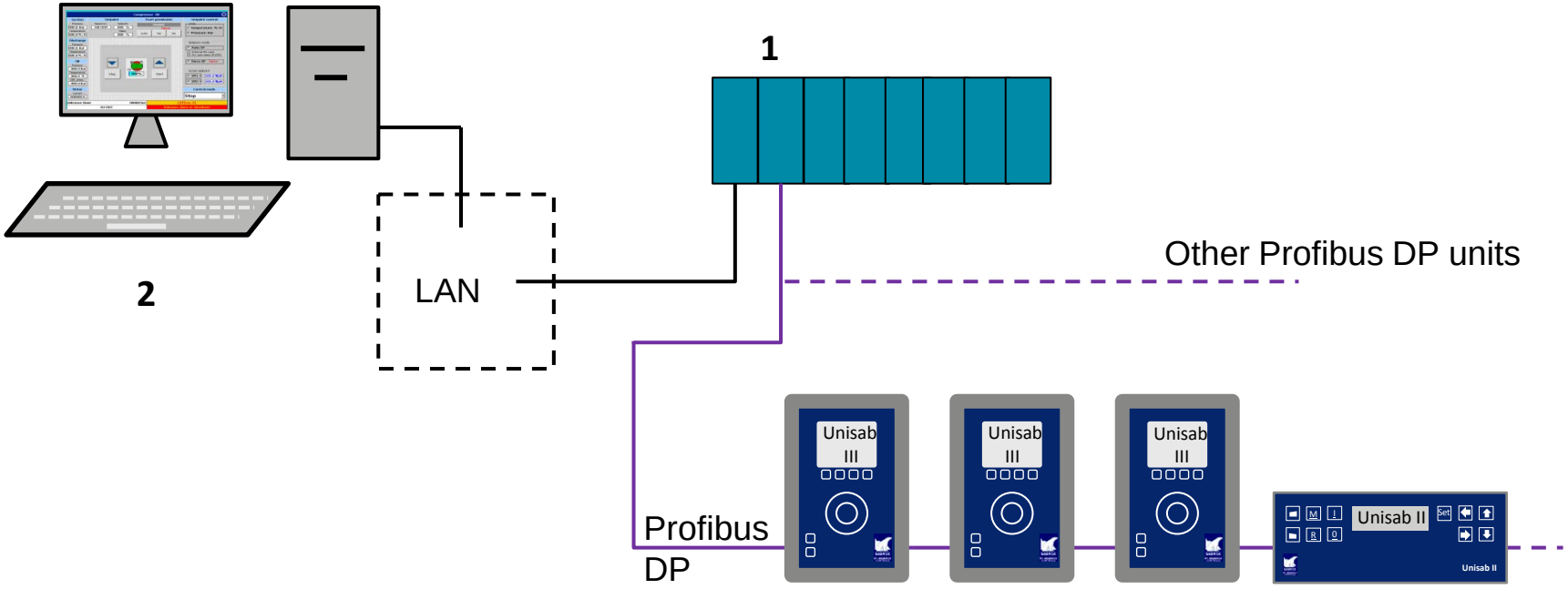
An RS2LAN converter allows for data aquisition and control from PC-based software systems with **OPC support**.

No converter is necessary if only sequencing is desired.

Unisab III internet communication options
Profibus connection

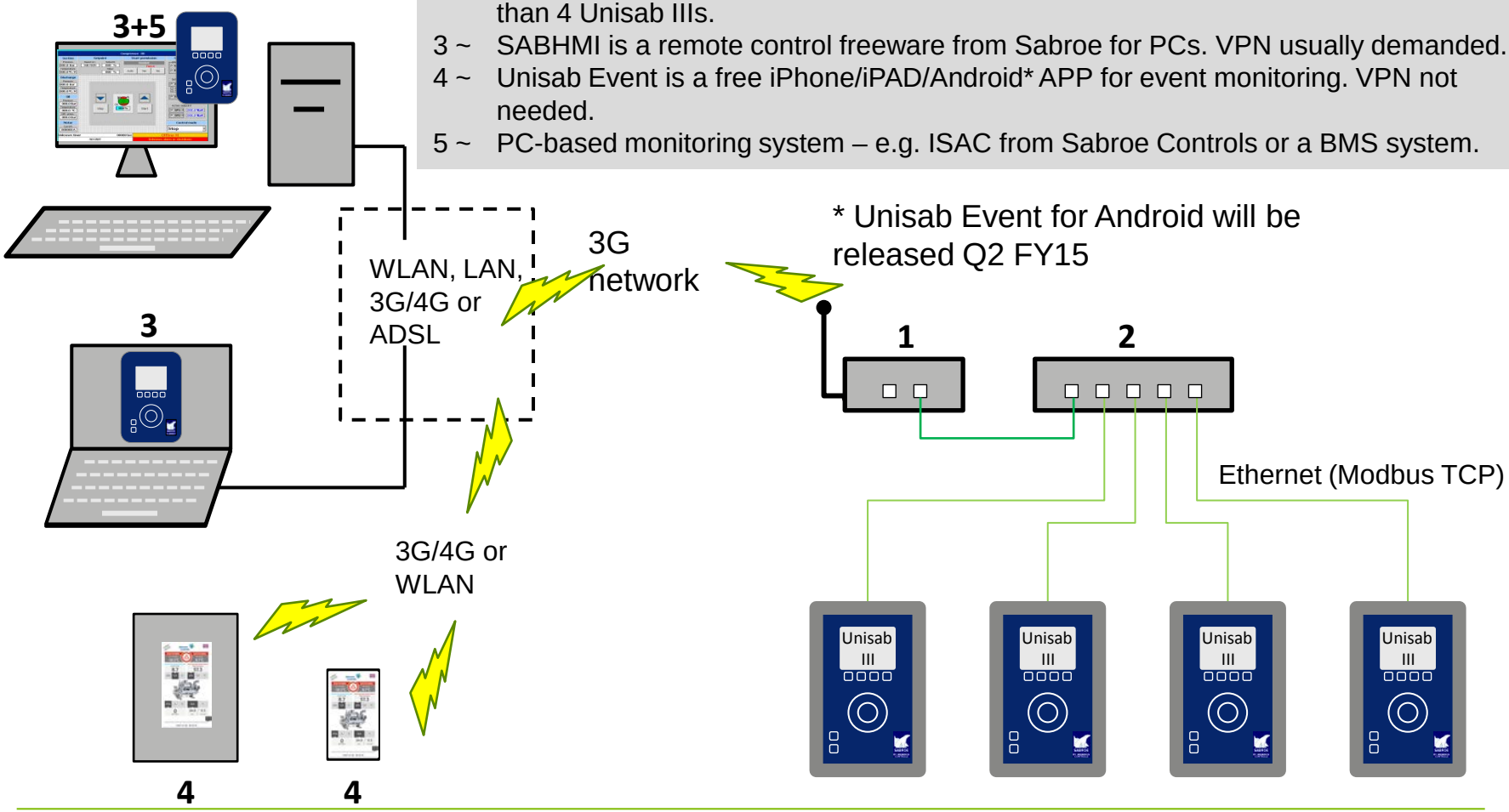
1 ~ PLC or other Profibus DP-compliant unit – e.g. Siemens S7-1500.
2 ~ PC-based monitoring system – e.g. ISAC from Sabroe Controls or a BMS system.

Designing Profibus networks has to be done according to Profibus specifications.
Unisab III has the Profibus interface as standard.
If not already present, the Unisab II can be retrofitted with Profibus interface. In its final years of its lifetime the Unisab II was fitted with Profibus interface as standard.



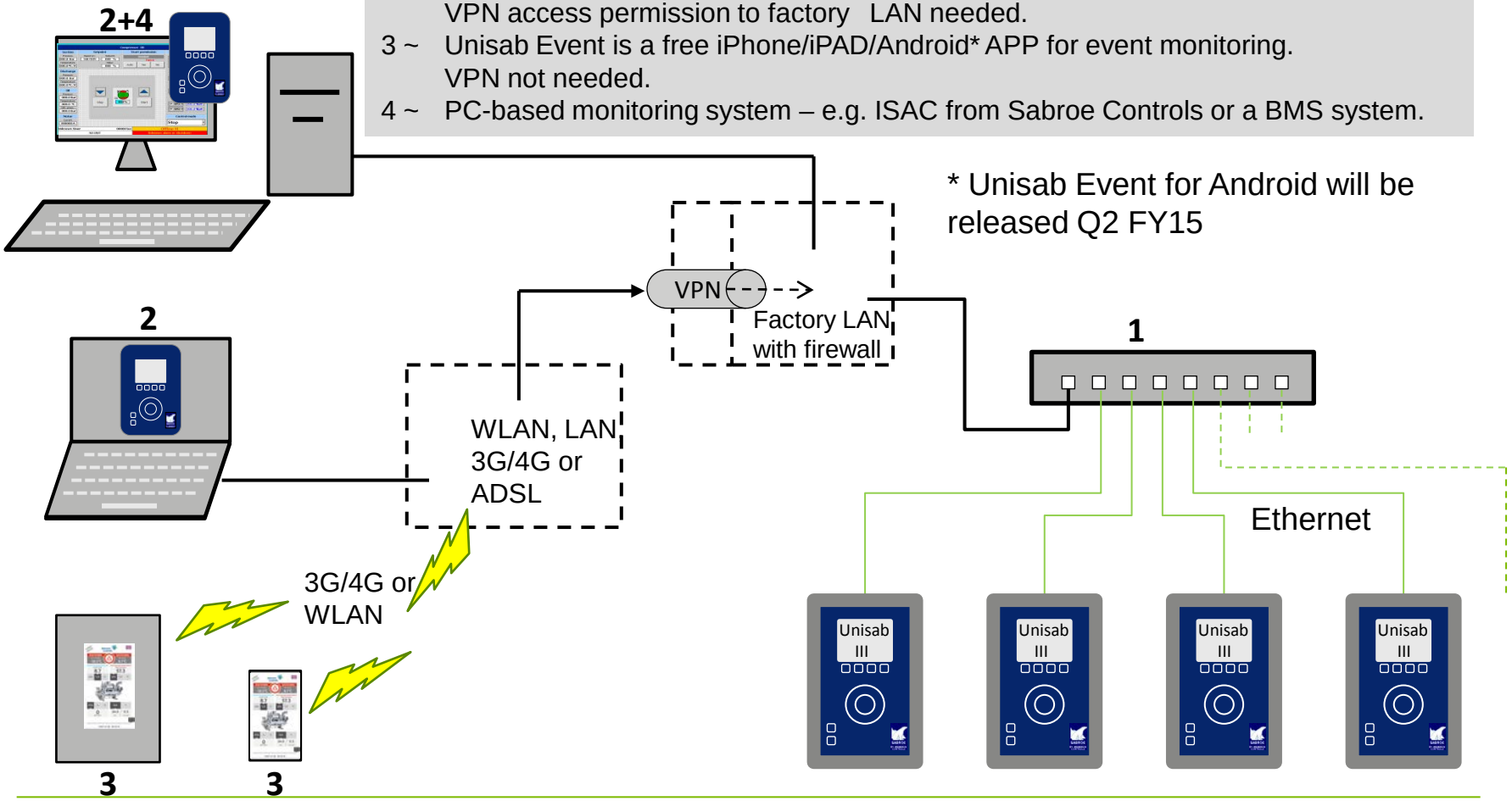
Unisab III internet communication options
Ethernet through 3G/4G mobile network

1 ~ INSYS MLR 3G mobile network modem with Vodafone SIM card. Sabroe stock items.
2 ~ LINKSYS RV042 VPN router. Add a switch or choose a router with more ports if more than 4 Unisab IIIs.
3 ~ SABHMI is a remote control freeware from Sabroe for PCs. VPN usually demanded.
4 ~ Unisab Event is a free iPhone/iPAD/Android* APP for event monitoring. VPN not needed.
5 ~ PC-based monitoring system – e.g. ISAC from Sabroe Controls or a BMS system.



Unisab III internet communication options
Ethernet through Factory intranet (LAN)

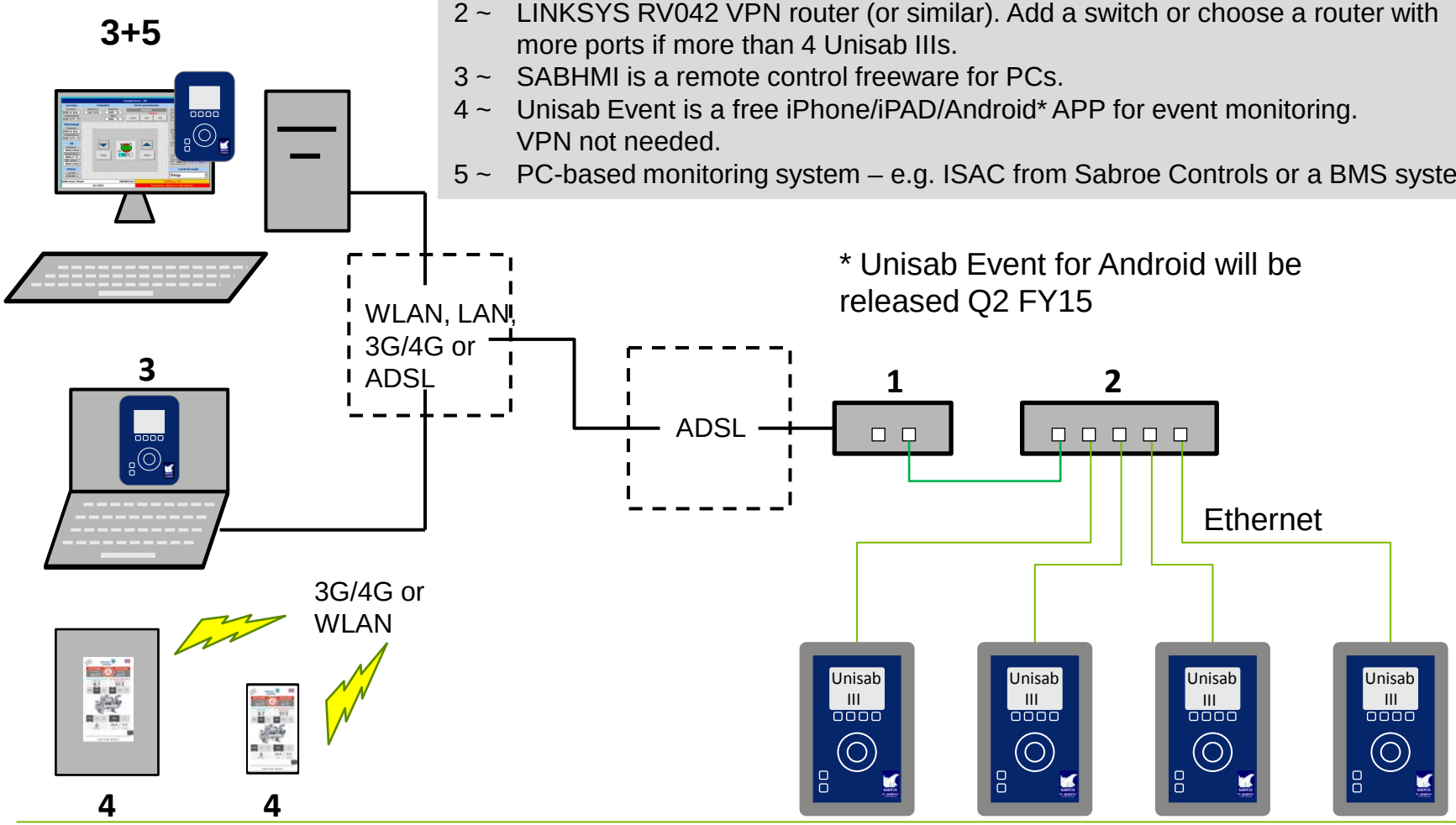
1 ~ Ethernet switch – e.g. factory network switchboard.
2 ~ SABHMI is a remote control freeware for PCs.
VPN access permission to factory LAN needed.
3 ~ Unisab Event is a free iPhone/iPAD/Android* APP for event monitoring.
VPN not needed.
4 ~ PC-based monitoring system – e.g. ISAC from Sabroe Controls or a BMS system.



* Unisab Event for Android will be released Q2 FY15

Unisab III internet communication options
Ethernet through ADSL internet connection

1 ~ ADSL modem from your internet provider.
2 ~ LINKSYS RV042 VPN router (or similar). Add a switch or choose a router with more ports if more than 4 Unisab IIIs.
3 ~ SABHMI is a remote control freeware for PCs.
4 ~ Unisab Event is a free iPhone/iPAD/Android* APP for event monitoring. VPN not needed.
5 ~ PC-based monitoring system – e.g. ISAC from Sabroe Controls or a BMS system.



* Unisab Event for Android will be released Q2 FY15

Unisab III internet communication options
Free Sabroe software

The next slides present the free Sabroe software applications for Unisab remote monitoring and configuration.

1. **SABHMI** which is for remote monitoring and remote operation of a Unisab III.

2. **UNISIM** which is for remote simulation of a compressor.

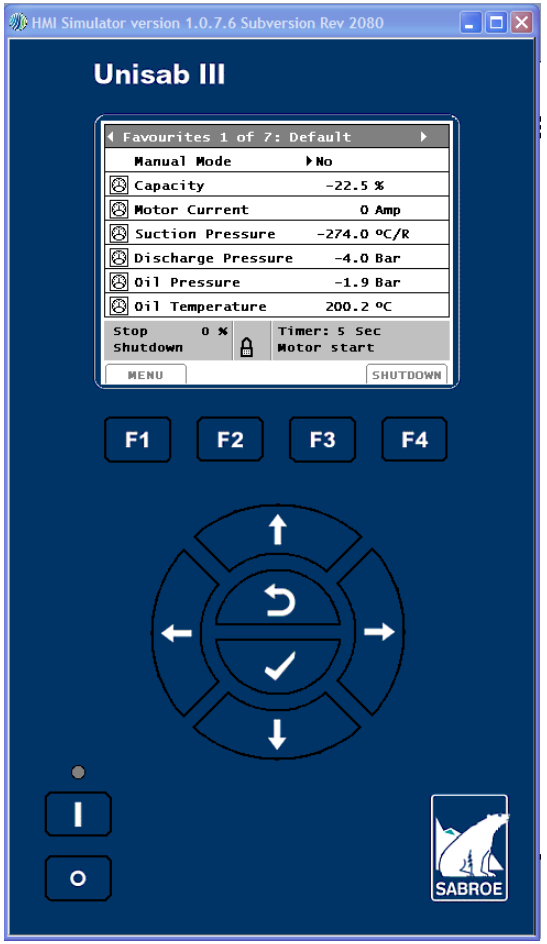
3. **Unisab Event** which is an APP for remote monitoring of Unisab III on iPhone/iPAD and Android units.

4. **U-SET** which is a spreadsheet for remote configuration of Unisab parameters and setpoints and for archieving these.

Sabroe free software applications for Unisab III
SABHMI

SABHMI is:

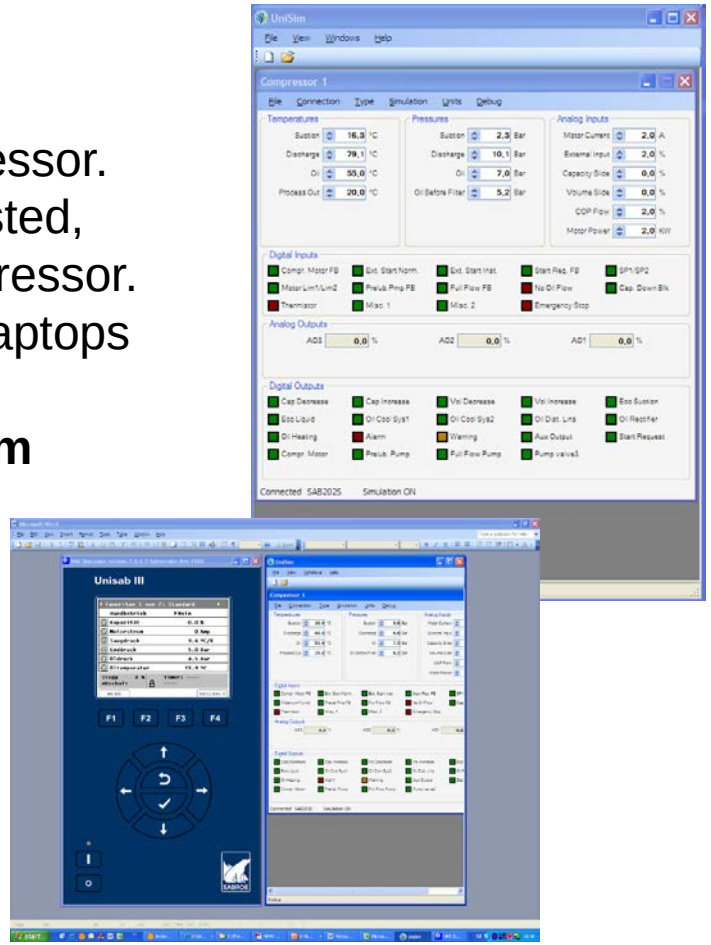
1. For remote monitoring and operation of Unisab IIIs
2. For Windows operating systems – PCs/Laptops
3. Free
4. Possible to download from **www. sabroe.com**



Sabroe free software applications for Unisab III
UNISIM is compressor simulator for PC install

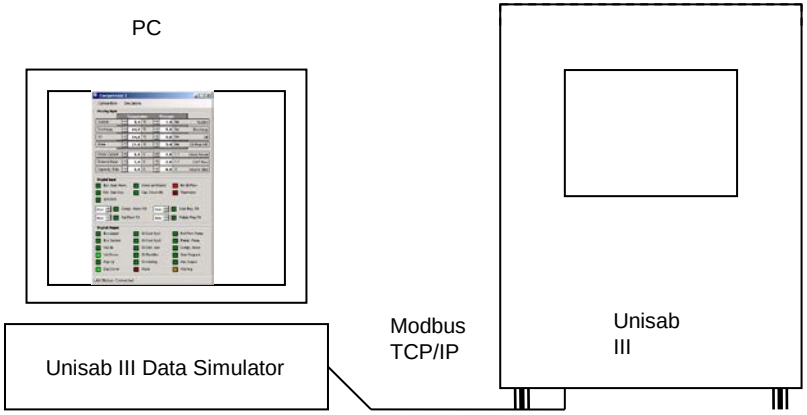
UNISIM

1. is a program that simulates being a compressor. Analogue and digital readings can be adjusted, simulating the actual condition of the compressor.
2. is for Windows operating systems – PCs/Laptops
3. is free of charge
4. can be downloaded from **www. sabroe.com**
5. can be connected to Unisab III's for overriding internal actual values
6. can be connected to **SABHMI** and used together as a tool for Unisab training – all on the PC and without a Unisab.

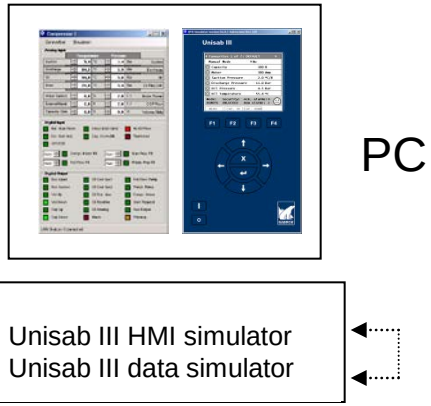


Sabroe free software applications for Unisab III
Overview SABHMI and UNISIM PC tools

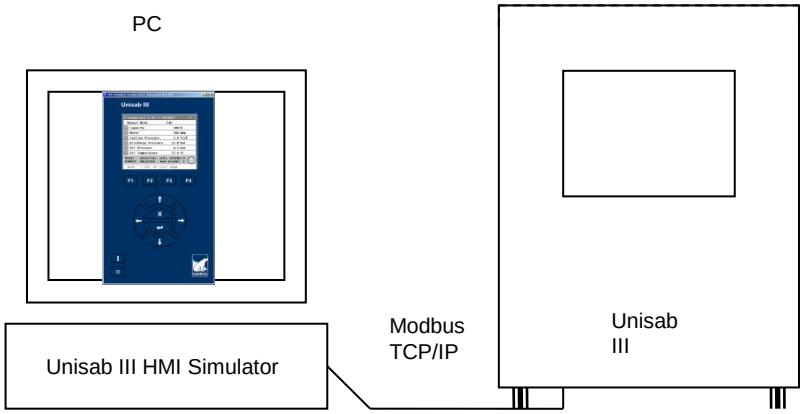
SABSIM – PC connection to a Unisab III



SABTool – Unisab III simulation on a PC



SABHMI – PC control of a Unisab III



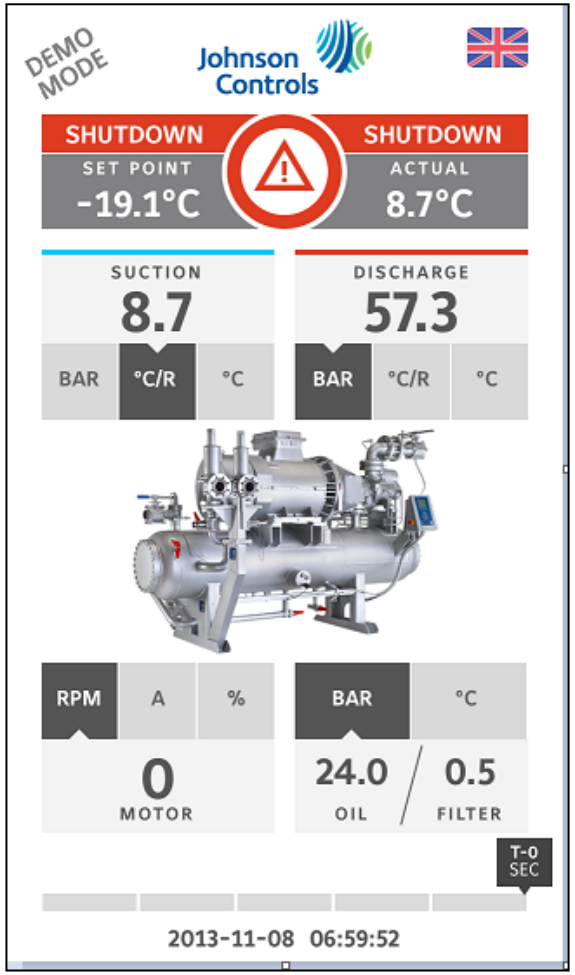
Sabroe free software applications for Unisab III
Unisab Event

Unisab Event

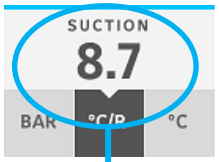
1. is a free APP for iOS (iPhone, iPAD) and Android units. The IOS version is available on Apple's app store. The Android version will be available on Google Play in Q2 FY15.
2. is a tool for early warning of irregularities and shutdowns of compressors with Unisab III.
3. offers 50 seconds of history up till the event or alarm.
4. gets its information from the Unisab by email sent by the Unisab.
5. is safe one-way communication. No interaction with the Unisab is possible and no data is send to the Unisab.

Main picture of compressor data.

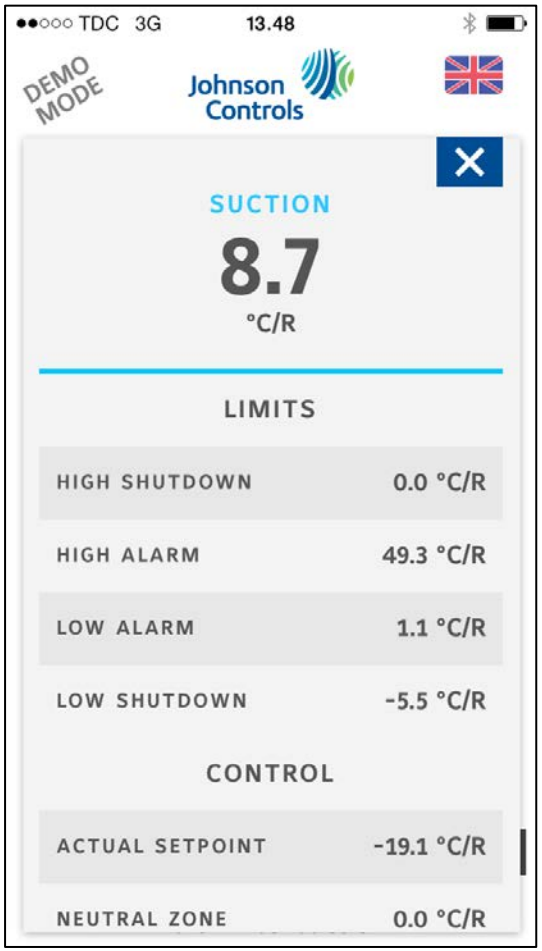
Compressor symbol is selected from information in data package.



Sabroe free software applications for Unisab III
Unisab Event



Tap this field
go get

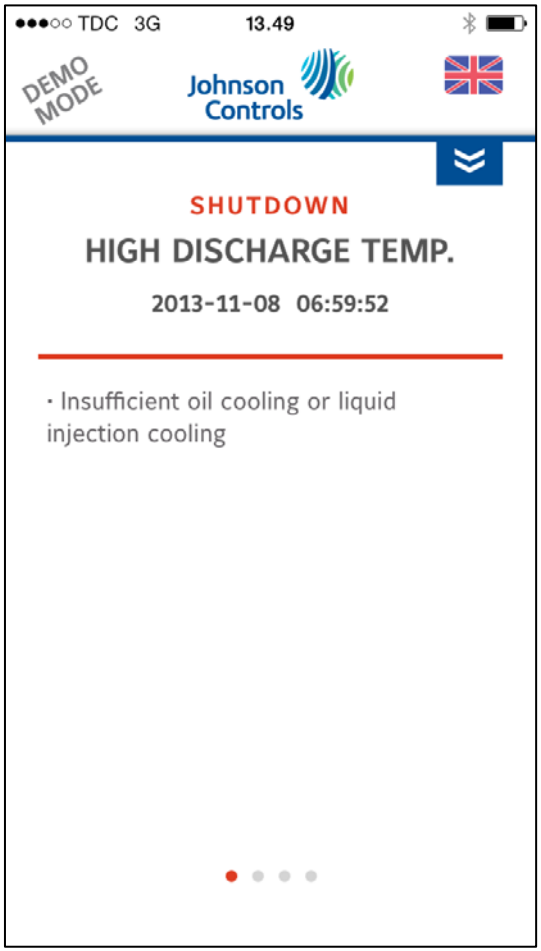


Sabroe free software applications for Unisab III
Unisab Event

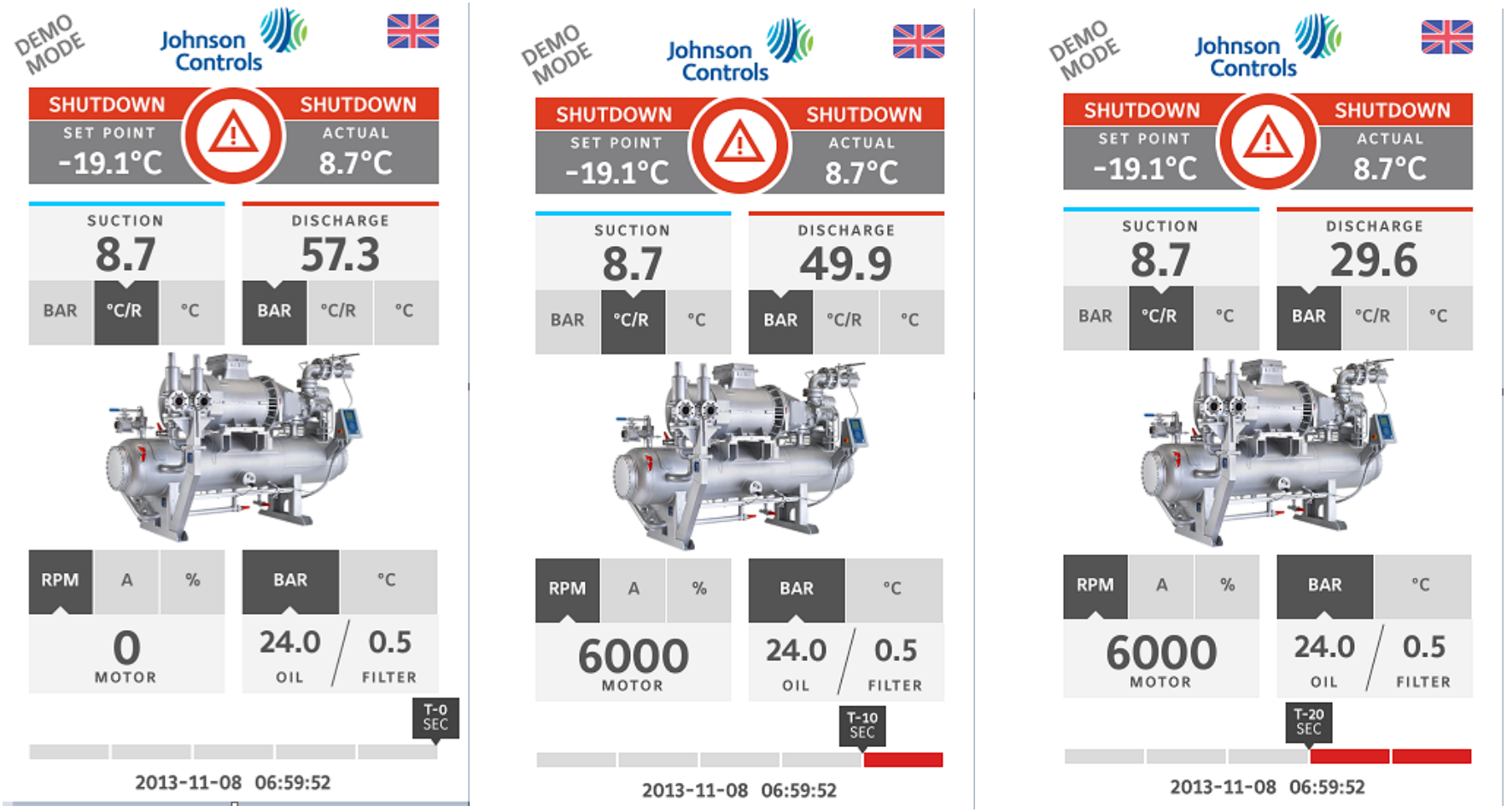
Tap compressor symbol
go get

Sabroe free software applications for Unisab III
Unisab Event

Tap this field
go get



Sabroe free software applications for Unisab III
Unisab Event

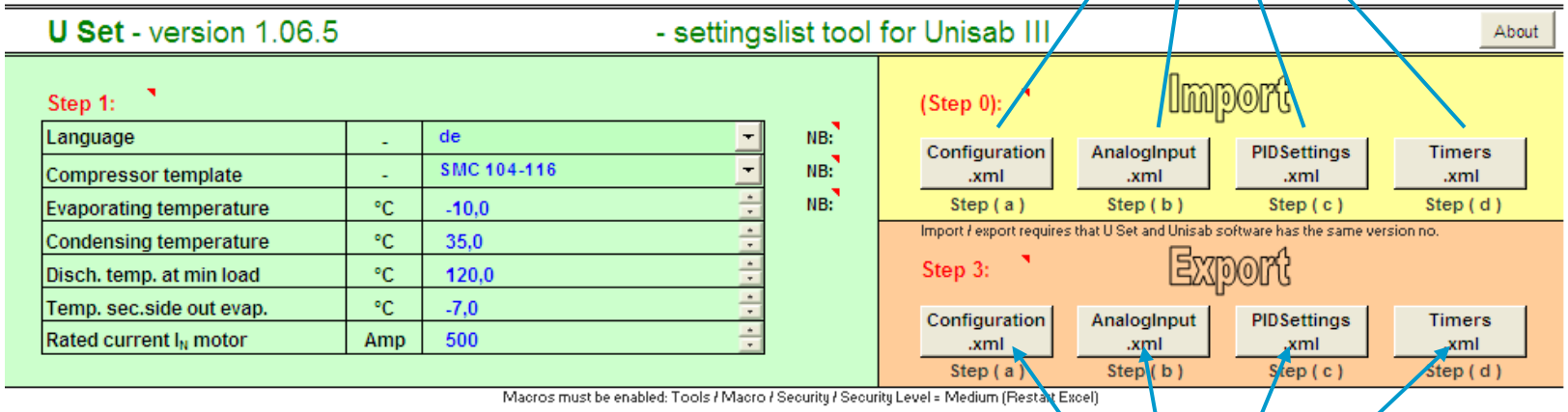


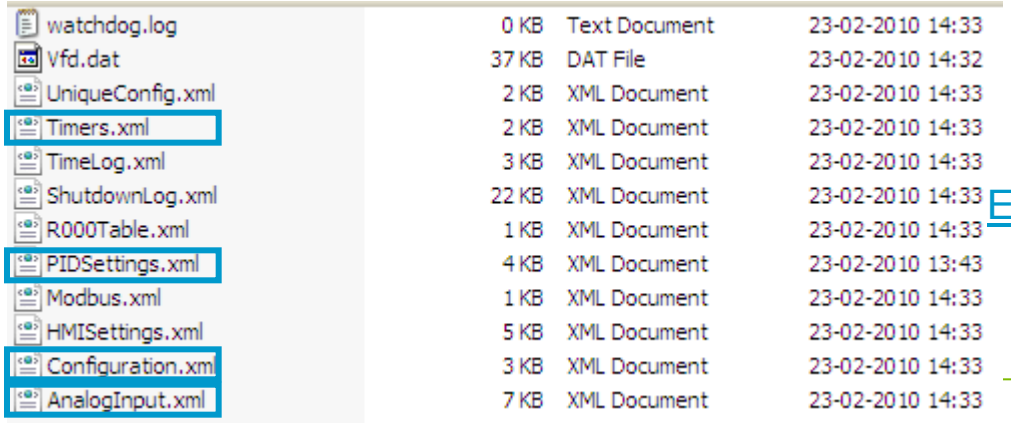
Sabroe free software applications for Unisab III
U-SET

U-Set

1. a PC tool for commissioning compressors and storing/archiving Unisab parameters.
2. free of charge
3. can be downloaded from **www.sabroe.com**

Import settings from a flash card to U-Set



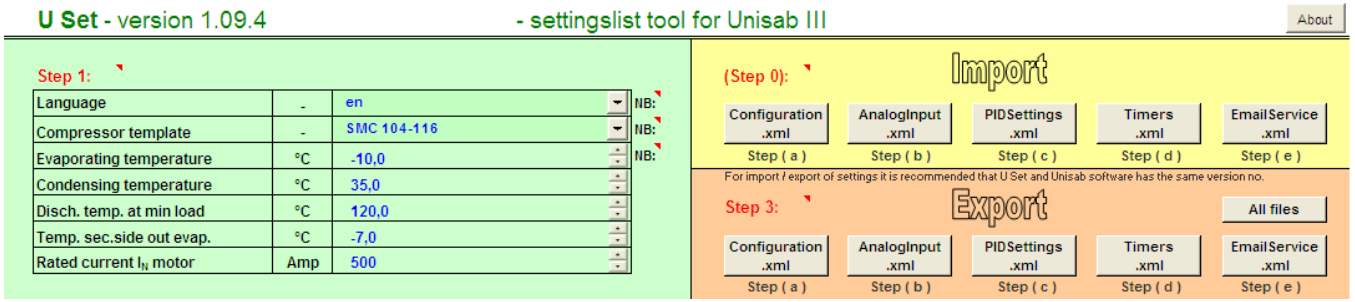


Export settings from U-Set to a flash card

U-Set

Sabroe free software applications for Unisab III
U-Set

- Plug the flash card into your PC to prepare for commissioning
- Start the U-set software package
- Start to fill in the settings you want for the actual application
- Export the files to your flash card, one at a time, or all 5 at the same time



- Bring the flash card on site and plug it into the Unisab III
- Set up the Unisab III to ”Boot mode” (Section 8 in the engineering manual)
- Copy the flash card into the Unisab III and take it out of the socket
- The Unisab will now have the settings you have made and will be ready to go.

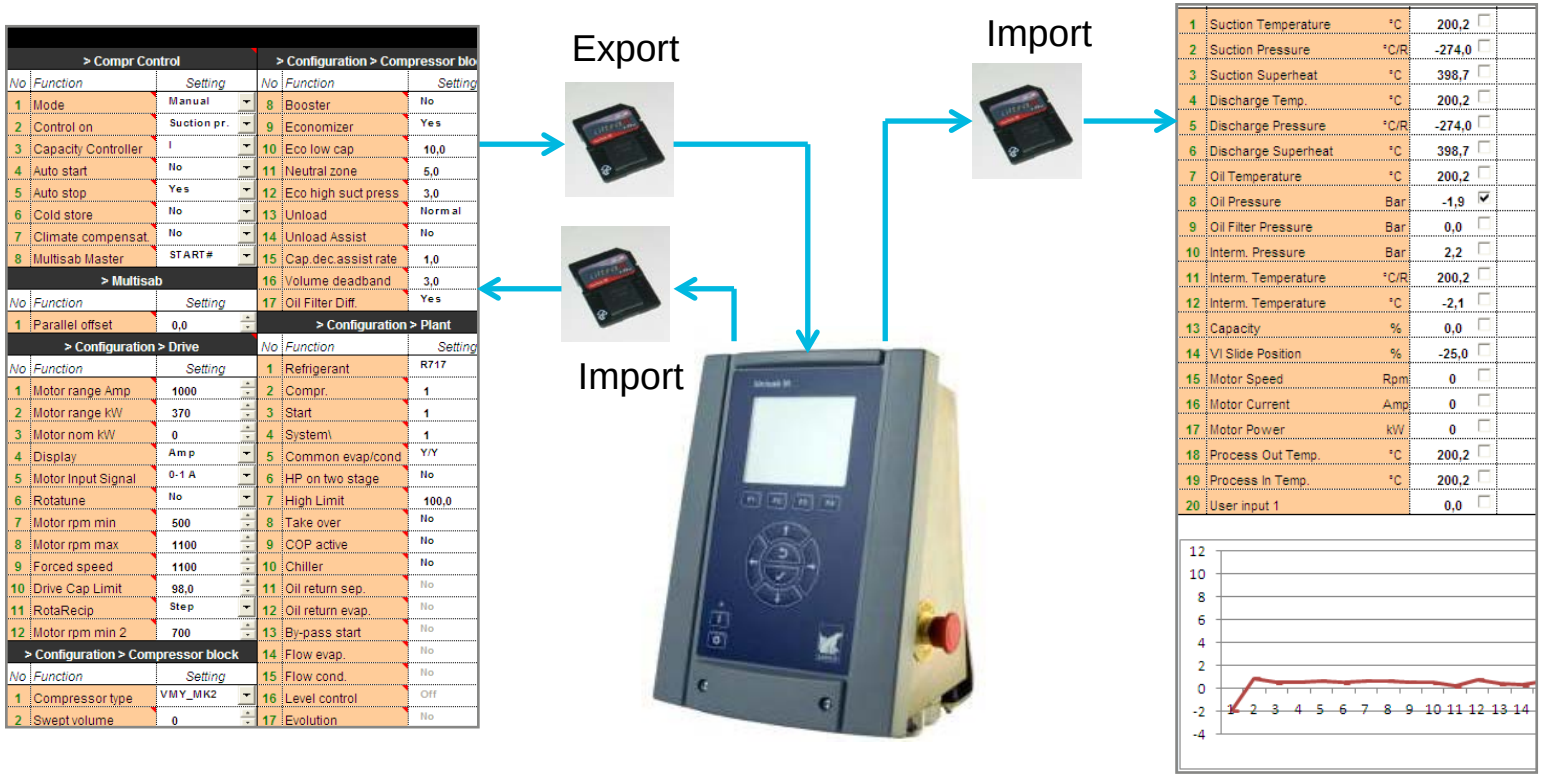
Sabroe free software applications for Unisab III
U-Set

U-Set setting tool

Prepare settings in the office and download to a SD flash card or upload field settings from an SD flash card.

Diagnosis tool

Upload the diagnose file to an SD flash card and import to the diagnosis tool.



> Compr Control		
No	Function	Setting
1	Mode	Manual
2	Control on	Suction pr.
3	Capacity Controller	I
4	Auto start	No
5	Auto stop	Yes
6	Cold store	No
7	Climate compensat.	No
8	Multisab Master	START#

> Multisab		
No	Function	Setting
1	Parallel offset	0,0

> Configuration > Drive		
No	Function	Setting
1	Motor range Amp	1000
2	Motor range kW	370
3	Motor nom kW	0
4	Display	Amp
5	Motor Input Signal	0-1 A
6	Rotatune	No
7	Motor rpm min	500
8	Motor rpm max	1100
9	Forced speed	1100
10	Drive Cap Limit	98,0
11	RotaRecip	Step
12	Motor rpm min 2	700

> Configuration > Compressor block		
No	Function	Setting
1	Compressor type	VMY_MK2
2	Swept volume	0

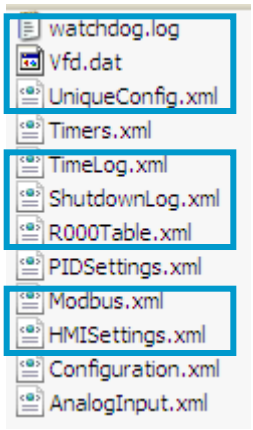
> Configuration > Compressor blo		
No	Function	Setting
8	Booster	No
9	Economizer	Yes
10	Eco low cap	10,0
11	Neutral zone	5,0
12	Eco high suct press	3,0
13	Unload	Normal
14	Unload Assist	No
15	Cap.dec.assist rate	1,0
16	Volume deadband	3,0
17	Oil Filter Diff.	Yes

> Configuration > Plant		
No	Function	Setting
1	Refrigerant	R717
2	Compr.	1
3	Start	1
4	System\	1
5	Common evap/cond	Y/Y
6	HP on two stage	No
7	High Limit	100,0
8	Take over	No
9	COP active	No
10	Chiller	No
11	Oil return sep.	No
12	Oil return evap.	No
13	By-pass start	No
14	Flow evap.	No
15	Flow cond.	No
16	Level control	Off
17	Evolution	No

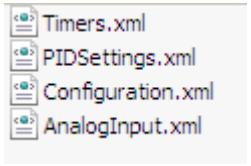
1	Suction Temperature	°C	200,2
2	Suction Pressure	°C/R	-274,0
3	Suction Superheat	°C	398,7
4	Discharge Temp.	°C	200,2
5	Discharge Pressure	°C/R	-274,0
6	Discharge Superheat	°C	398,7
7	Oil Temperature	°C	200,2
8	Oil Pressure	Bar	-1,9
9	Oil Filter Pressure	Bar	0,0
10	Interm. Pressure	Bar	2,2
11	Interm. Temperature	°C/R	200,2
12	Interm. Temperature	°C	-2,1
13	Capacity	%	0,0
14	VI Slide Position	%	-25,0
15	Motor Speed	Rpm	0
16	Motor Current	Amp	0
17	Motor Power	kW	0
18	Process Out Temp.	°C	200,2
19	Process In Temp.	°C	200,2
20	User input 1		0,0

Unisab III – Compressor controller
Boot loader

Transfer of settings
from Unisab III to SD



Remove the marked files
from the SD card



Copy the files from the the SD
card into another Unisab III