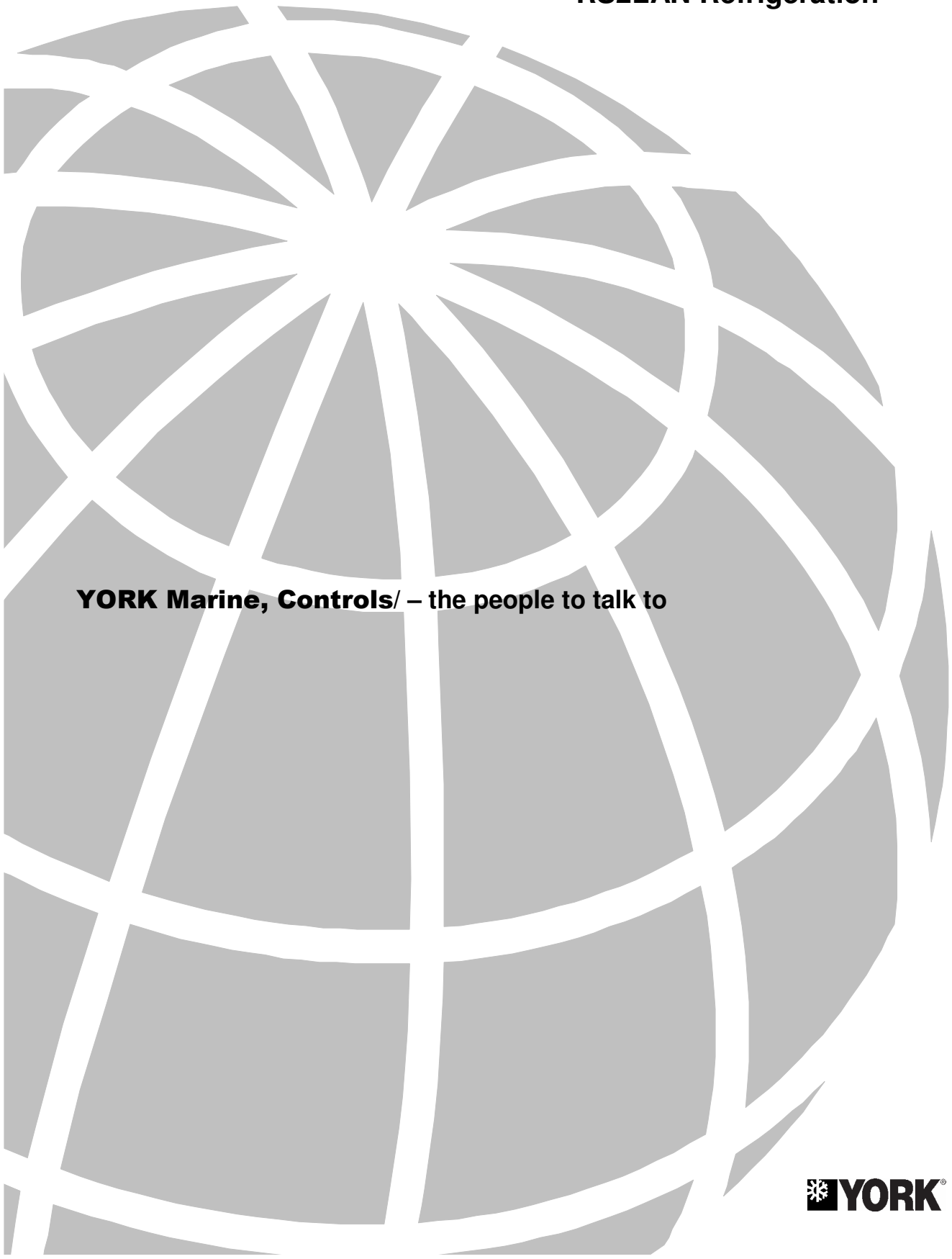
RS2LAN Refrigeration Installation guide

RS2LAN Refrigeration



YORK Marine, Controls/ – the people to talk to

YORK

RS2LAN Refrigeration Installation guide

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1 INTRODUCTION

The purpose of this document is to give the user an idea of how to use and how to configure the RS2LAN converter, and install the OPC_{RS2LAN} Server, on the SCADA pc.

1. We describe the hardware of the RS2LAN converter, so the user will get a minimum of knowledge of this product.
2. We have the installation guide for the RS2LAN.
3. Then we have the installation guide for the OPC_{RS2LAN} Server.
4. Appendix with tag number table

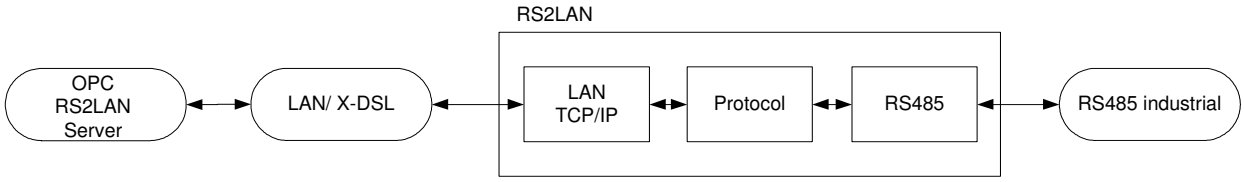
When you follow the steps in this manual the RS2LAN Refrigeration, will be ready for running.

The RS2LAN converter can communicate with the following units:

- UNISAB II R.
- UNISAB II.
- UNISAB II Evolution.
- UNISAB COP.

1.1 The function of the RS2LAN

1.1.1 Basic function



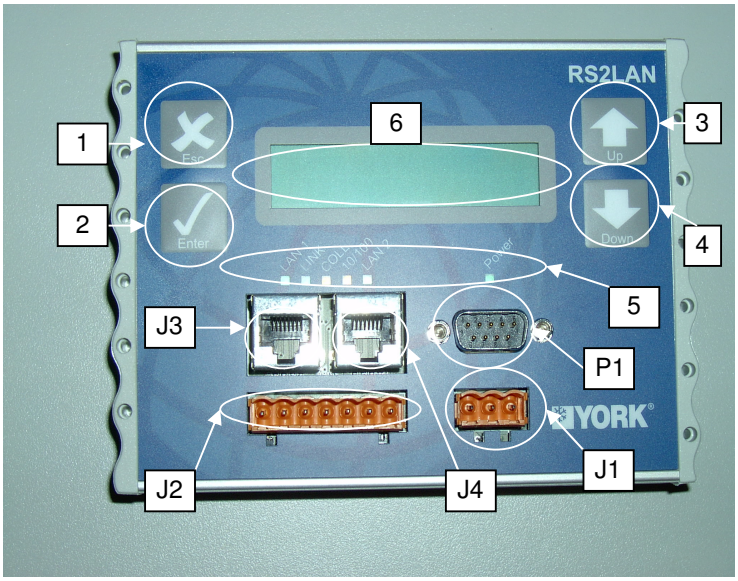
1.1.2 Main features

- The RS2LAN includes one RS485 channel and one LAN channel.
  Note: On the RS2LAN front, two LAN connectors are found, however, you can only use one of them. The RS2LAN determines on which connector LAN activity is present. Be aware that the two connectors do not include any LAN SWITCH or LAN HUB functionality.
- The RS2LAN can serve a maximum of 14 RS485 devices and can handle a maximum of 1 connection on the LAN TCP/IP interface.
- The software application of the RS2LAN does host a small homepage (Java applet). This allows you to configure and monitor the product using a standard Internet browser.
- The RS2LAN is includes a **H**uman-**M**achine **I**nterface (HMI), consisting of a 2 line LCD display, 4 push buttons and a number of indicators (LED's). By means of the HMI you can configure and monitor all relevant parameters. Before using the product, you have to select certain parameters, such as the TCP/IP address.
- The RS2LAN can be used in two handling modes, Client or Server.

One RS232 channel is available as service port for firmware updates. **YORK internal use only**.

2 THE RS2LAN HARDWARE

2.1 The RS2LAN layout

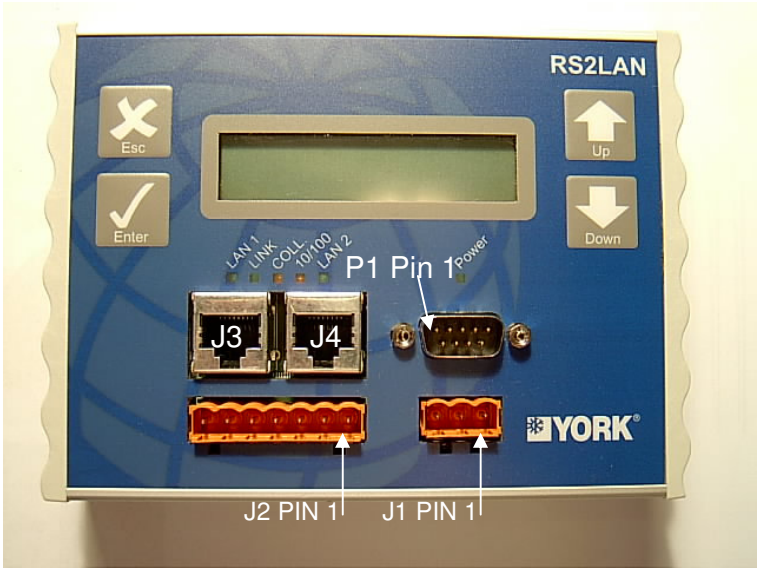


2.1.1 Layout description

No	Key pad	Description
1	[Esc]	Escape
2	[Enter]	Confirm selection
3	[Up]	Move up in sub menus/ Change selection
4	[Down]	Move down in sub menus/ Change selection
No	**Connectors**	**Description**
J1	Power	24V ac/dc ± 20% @ 50/60Hz
J2	RS485	Standard RS485 industrial
J3	LAN 1	**NOT USED**
J4	LAN 2	Protocol TCP/IP 10/100
P1	Service port	Upgrade firmware
No	**Visual information**	**Description**
5	Led's	Power, LAN1/2, 10/100, Collision, Link
6	Display	2 lines of 20 characters each

2.2 Patching up cables

The following hardware description is needed for patching up the cables for the supply power and the RS485 communication.



2.2.1 Connector specifications

Power Supply Connector Specifications (J1):			
1: 24V ac/dc – phase/+	2: EARTH	3: 24V ac/dc – neutral/-	

Note: The RS2LAN is fused internally by a reset-able fuse.

RS485 Connector Specification (J2):			
1: RS485 VCC	2: Rx/Tx+	3: Rx/Tx-	4: RS485 Ground
5: Rx/Tx+	6: Rx/Tx-	7: RS485 Ground	
LAN Connector Specification (J3): NOT USED			
LAN Connector Specification (J4):			
1: TXA (+)	2: TXA (-)	3: RXA (+)	4: Cable termination
5: Cable termination	6: RXA (-)	7: Cable termination	8: Cable termination
Shell: Earth Chassis			
RS232 Connector Specification (P1): Not used			
1: Not connected	2: RXD input	3: TXD output	4: Not connected
5: Earth/Chassis	6: Not connected	7: RTS output	8: CTS input
9: Not connected	Shell: Earth/Chassis		

Technical Specifications:

- **2 line 16 character and 4 button MMI.**
- **Staus LED's for LAN interface and power.**
- **RS232 interface**
- **RS485 interface**
- **10/100Mbit LAN interface with auto select between two connectors.**
- **2 wire RS-485 interface for network communication featuring 1 unit load.**
- **Re-programmable through RS232 or LAN.**

Electrical Specifications		
Power supply, steady state	24 ±20% @ 50/60Hz	$V_{AC/DC}$
Power consumption, typical	12	VA
Operating temperature	$0 < T_{ambient} < 70$	℃
Storage temperature	$-30 < T_{ambient} < 85$	℃
Humidity	95% non condensing	
Dimensions (l x w x h)	140 x 75 x 35	mm
Weight approximately	400	G

Communication Specification		
Network communication	RS-485	Max 115kbaud
Pier to Pier communication	RS232	Max 115kbaud
Network communication	LAN tcp/ip	10/100Mbit

Note: The actual baudrate on the RS232 and RS485 depends upon the software application.

Environmental Specification (CE)	
EMC Emission	EN50081-2 (1993), Generic Standard, Industrial Environment.
EMC Immunity	EN50082-2 (1995), Generic Standard, Industrial Environment and IEC 61000-6-2 (1999) Generic Standard, Industrial Environment.
Vibration	IEC68.2.6, IEC68.2.29 and IEC68.2.64
Temperature	IEC68.2.1 and IEC68.2.2
Humidity	IEC68.2.30

Mounting Specifications:
The RS2LAN is mountable on a standard DIN rail. A wall mounting kit is available as YRMC P/N: 1588-003.

2.3 Cable recommendation

For LAN cable - Use type category 5e.

For RS485 - Use cable with the following specification:

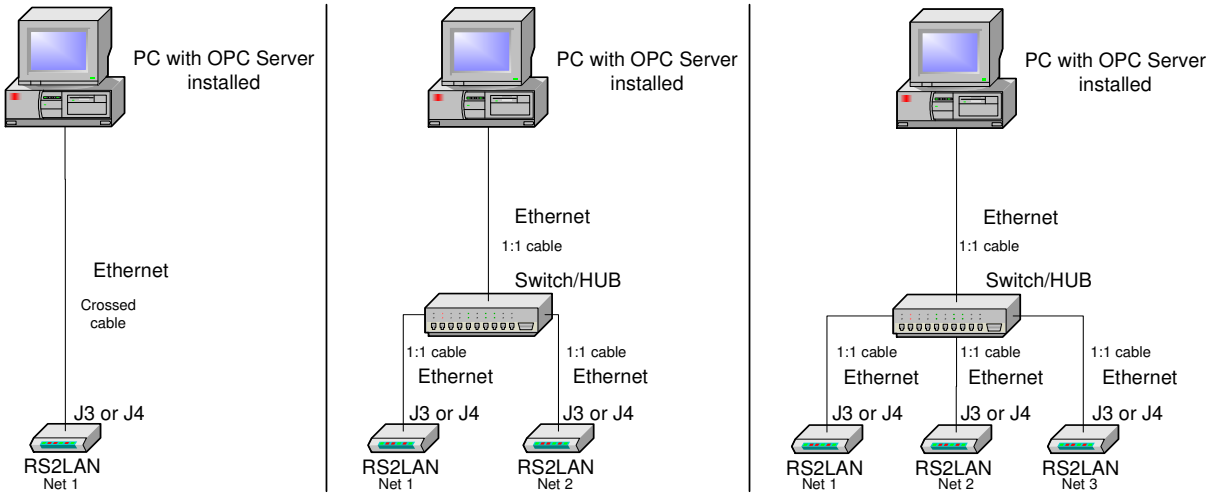
Impedance:	135 up to 165 Ohm at a frequencies > 100 kHz
Cable capacity:	Type < 60 pF per Meter
Core diameter:	> 0,22 mm², corresponds to AWG 24
Cable type:	Twisted pair cable. 1x2 or 2x2.
Signal attenuation:	Max. 9 dB over total length of line section/cluster
Shielding:	CU shielding braid or shielding braid and shielding foil

To secure correct working voltage and eliminating cable reflections, termination must be appointed in a RS485 network. Termination of the RS485 network must be present, in each end of the physical cable.

2.4 Network overview

2.4.1 LAN Network

The OPC_{RS2LAN} Server can communicate with up to tree. RS2LAN, when more that one RS2LAN there has to be a switch/hub between the PC and the RS2LAN as shown below.

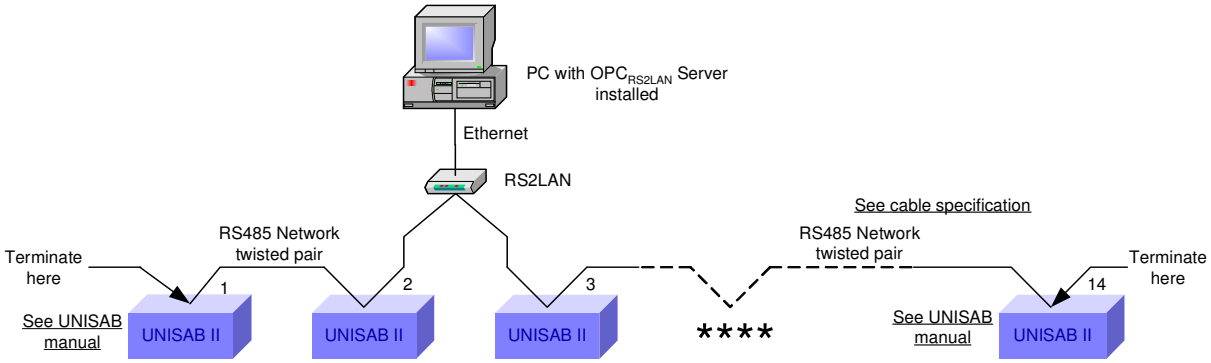


If the network has more that one RS2LAN converter, the RS2LAN converters has to be setup with different IP addresses. Please see chapter 3 for IP setup.

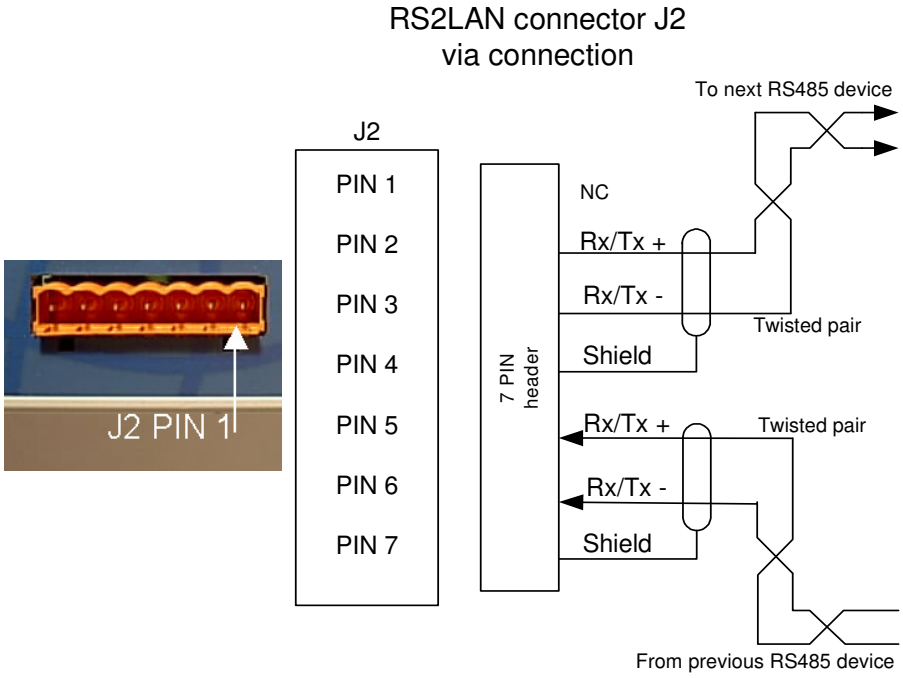
2.5 RS485 communication

There are two types of RS485 system connection, as illustrated below and on next page.

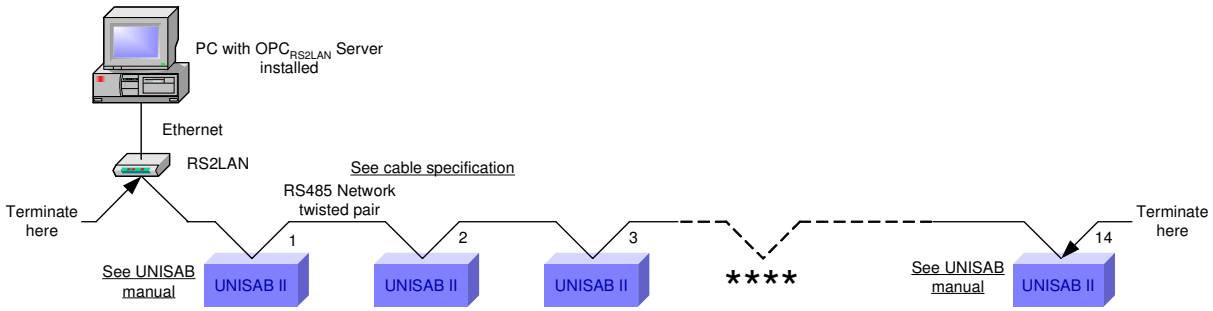
2.5.1 RS485 Network. Via connection



"Via connection" means that the communication goes via the RS2LAN, that is, you find two RS485 cables connected to the unit.

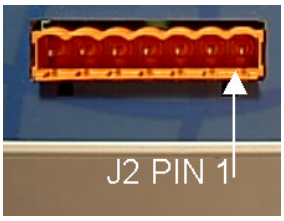


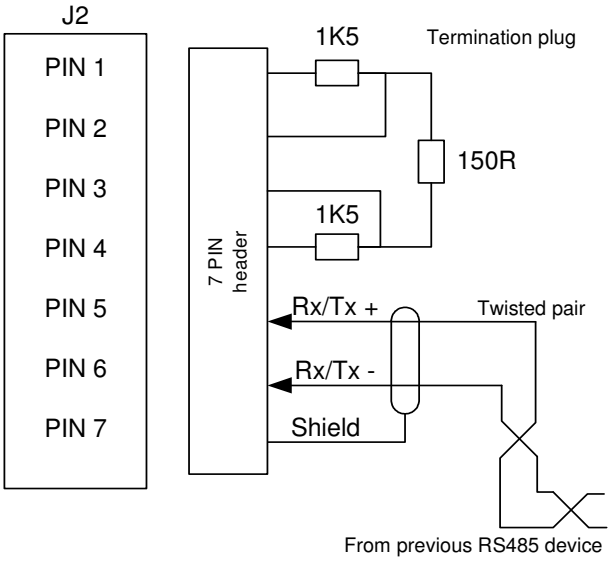
2.5.2 Endpoint connection



"Endpoint connection" means that the RS2LAN is situated at the end of the network. Termination resistors must be applied in this case.

RS2LAN connector J2
endpoint connection





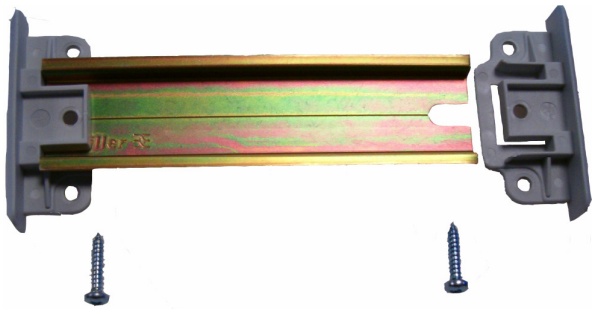
3 INSTALLATION OF RS2LAN CONVERTER

The Installation set consists of the following:

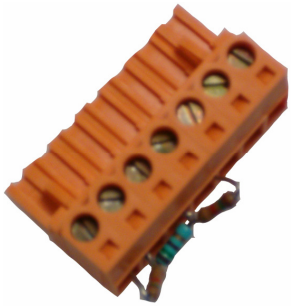
1. One RS2LAN converter.
2. One Wall mounting set.
3. One End termination for the RS485 network.
4. One Patch cable (RJ45-crossed) for the LAN (Ethernet) connection.
5. One Power Supply 100-240VAC 50-60Hz to 24VDC 400mA.
6. One Power cable (from Power Supply to RS2LAN).
7. One CD-Rom with OPC_{RS2LAN} Server.

1)

2)



3)

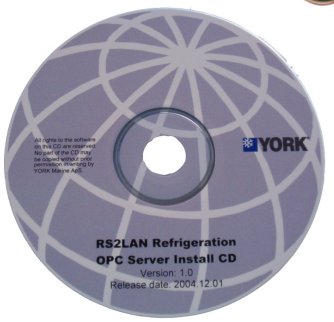


4)

5)

6)

7)



3.1 RS2LAN User interface (HMI)

3.1.1 Introduction

In the following pages you will find two “flowcharts” and a table describing the user interface available on the RS2LAN.

The menu structure is simple:
You use the [Up] and [Down] keys to navigate. No picture is "default" or "primary".

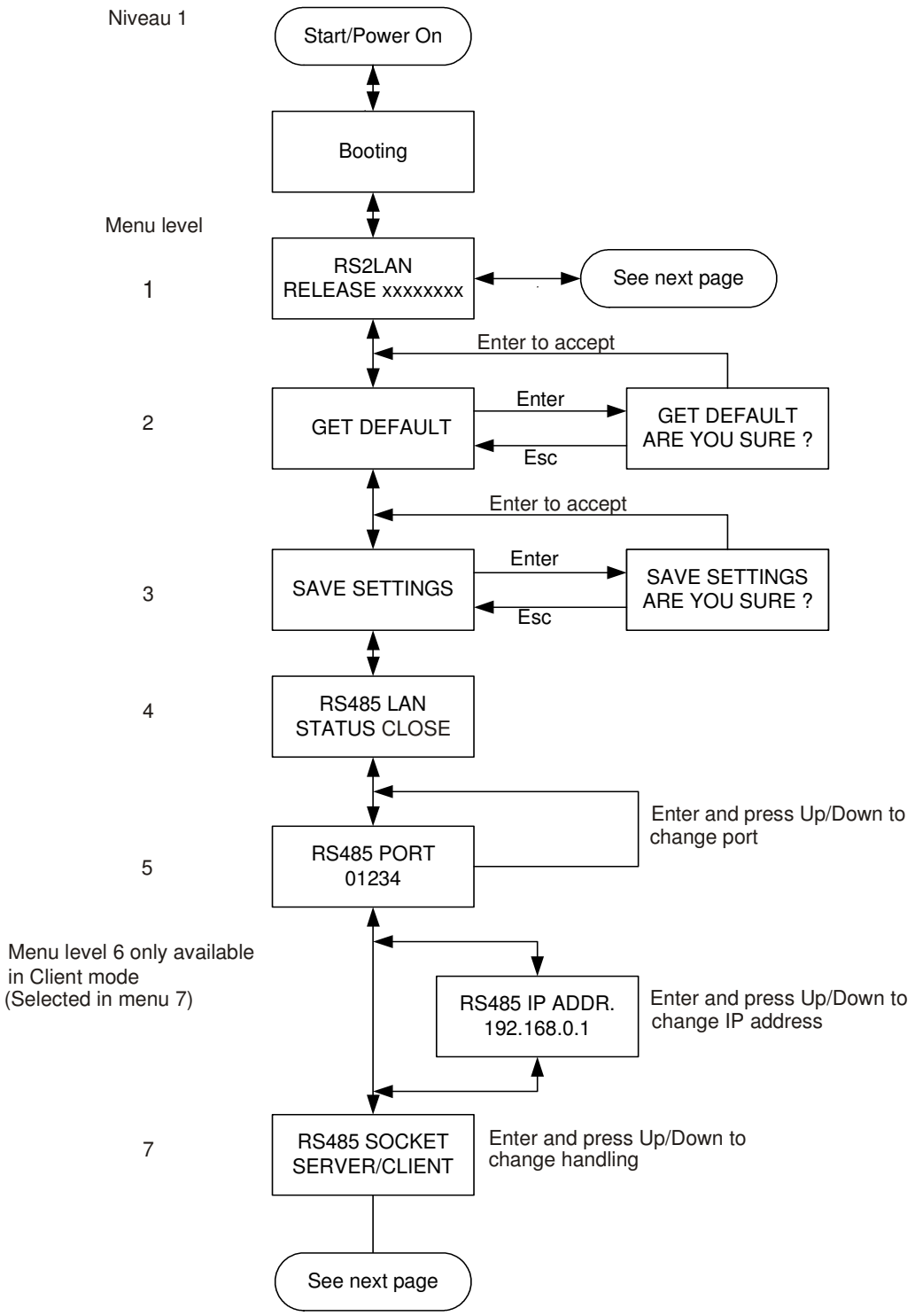
3.1.2 How to understand the flowcharts

- The arrows indicate how to move up/down through all the settings/menus.
- The text in the rectangular boxes shows the content of the display.
- The oval figure means "no action", it is only a point of start/end or reference to the other flowchart.

3.1.3 How to change settings

- To initiate a change of some setting, press [Enter]. You will se that the current value/setting starts flashing.
- Use the [Up]/[Down] buttons to change the part that is flashing.
- If more than one digit, press [Enter] to move to the next digit.
- If necessary, press [Enter] repeatedly until no flashing is present.
- Then you can go further and make changes in other menus.
- **Always remember** to go to the “SAVE SETTINGS” menu to accept all your changes.
  In the “SAVE SETTINGS” menu, press [Enter] twice.

3.1.4 HMI Setup



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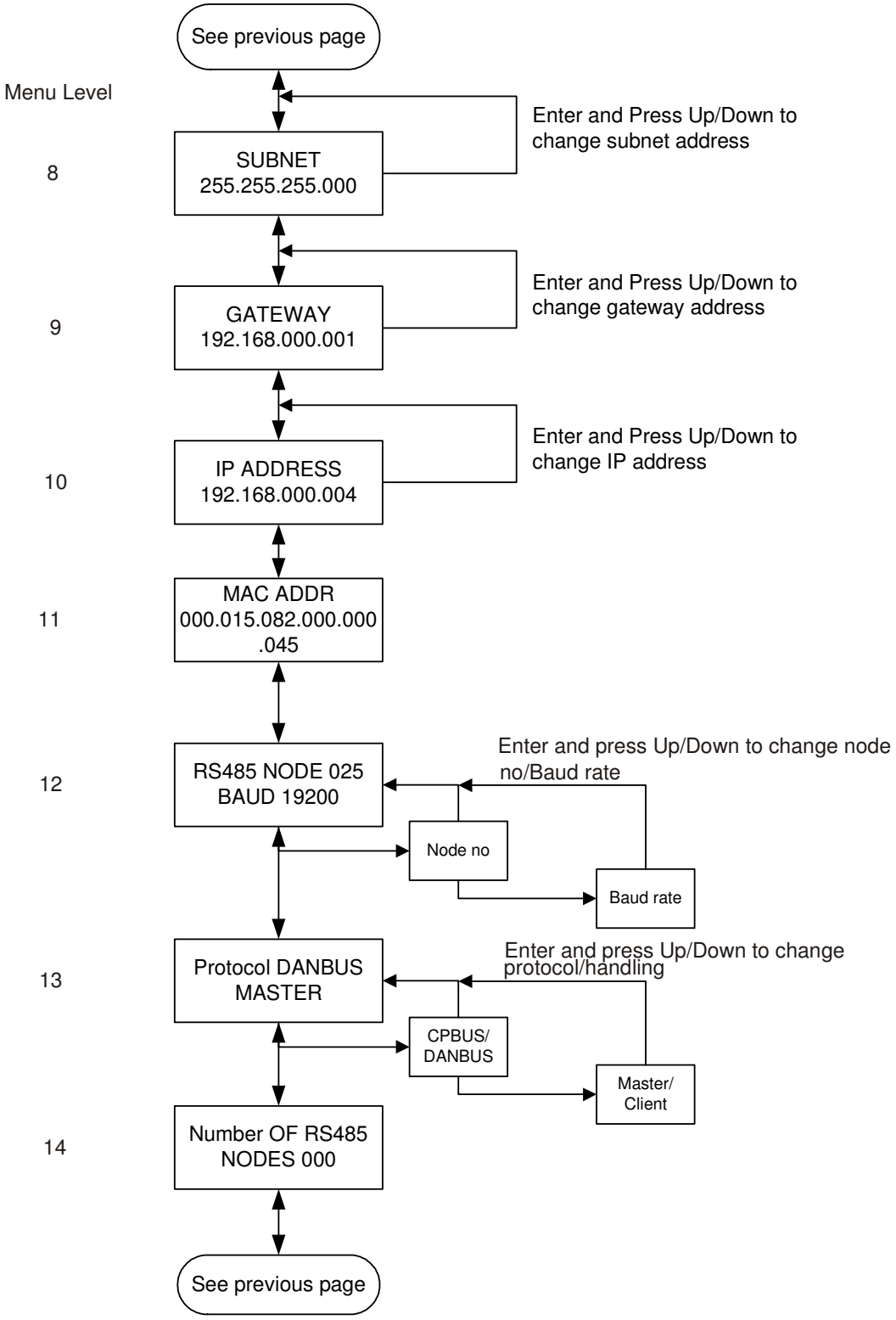

3.2 Description of sub menus

The numbers in the "Menu level" column refer to the flowcharts in "The RS2LAN User interface (HMI)" on page 12 and 13.

Menu level	Description
1	Release date of firmware (xxxxxxxx).
2	GET DEFAULT means: Return to factory settings.
3	Each time you make any changes in any menus, you need to use this menu to save the new settings.
4	Show LAN status for the current setup: CLOSE: Means there could not be established a connection between Client or Server. This depends on the choice made in menu level 7. LISTEN: Means the device is listening on a specific port number. ESTABLISHED: Means that the connection between a server and a Client is established
5	This setting makes the RS2LAN box call up or listen on this particular port. Port range [0 – 65535]. Default [01234].
6	(This menu is not enabled by default – it is only available in Client mode). RS485 Address, this IP address must be the server address IP address range [0.0.0.0 – 255.255.255.255] Default [255.255.255.0]
7	RS485 SOCKET: Server/Client SERVER: Means it will listen on the port specified in Menu level 5. CLIENT: Means it will try to connect on to an external server on the port specified in Menu level 6. Default [SERVER]
8	The subnet is used to specify where the RS2LAN box IP Address may vary from and what host it is defined to. The Subnet address range is [0.0.0.0 – 255.255.255.255]. Default [255.255.255.0]
9	The GATEWAY address is only needed if the RS2LAN is used in a WAN configuration. GATEWAY address range is [0.0.0.0 – 255.255.255.255] Default [192.168.0.1]

Continued on next page

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Menu level	Description
10	This is the IP address of the RS2LAN itself. Note that the built-in homepage (see "The Built-in Homepage (Java Applet)" on page 15) is appointed to this address, allowing you to monitor and configure the unit by means of a standard Internet browser. Default [192.168.0.4]
11	This MAC address is a unique ID number witch cannot be altered.
12	This menu is the hardware setup for the RS485 communication: RS485 node number and communication speed (baud rate). RS485 node range is [0 – 125]. The possible baud rates are [9600 – 19200 – 38400]. Default node No. is [025] and default baud rate is [19200].
13	This menu decides the protocol used on the RS485, and the RS2LAN mode. Protocol options: [Danbuss – Cpbus]. Default: [Danbuss]. Mode options: [Master – Client]. Default: [Master].
14	This menu is for information only. It shows the actual number of RS485 nodes communicating on the network.

3.3 The Built-in Homepage (Java Applet)

3.3.1 Introduction

The built-in homepage in the RS2LAN allows you to monitor and configure the unit from a PC on the LAN, using a standard Internet browser. This may be useful if the RS2LAN is situated in a remote location.

3.3.2 The homepage's IP address

The homepage is situated/activated on the IP address of the RS2LAN. Note that this address can be changed.

ADR	FACTORY SETTING
IP	[192.168.0.4]
SUBNET	[255.255.255.0]
GATEWAY	[192.168.0.1]

The Settings above are **factory settings** when RS2LAN are configured please note that the IP address are different from above.

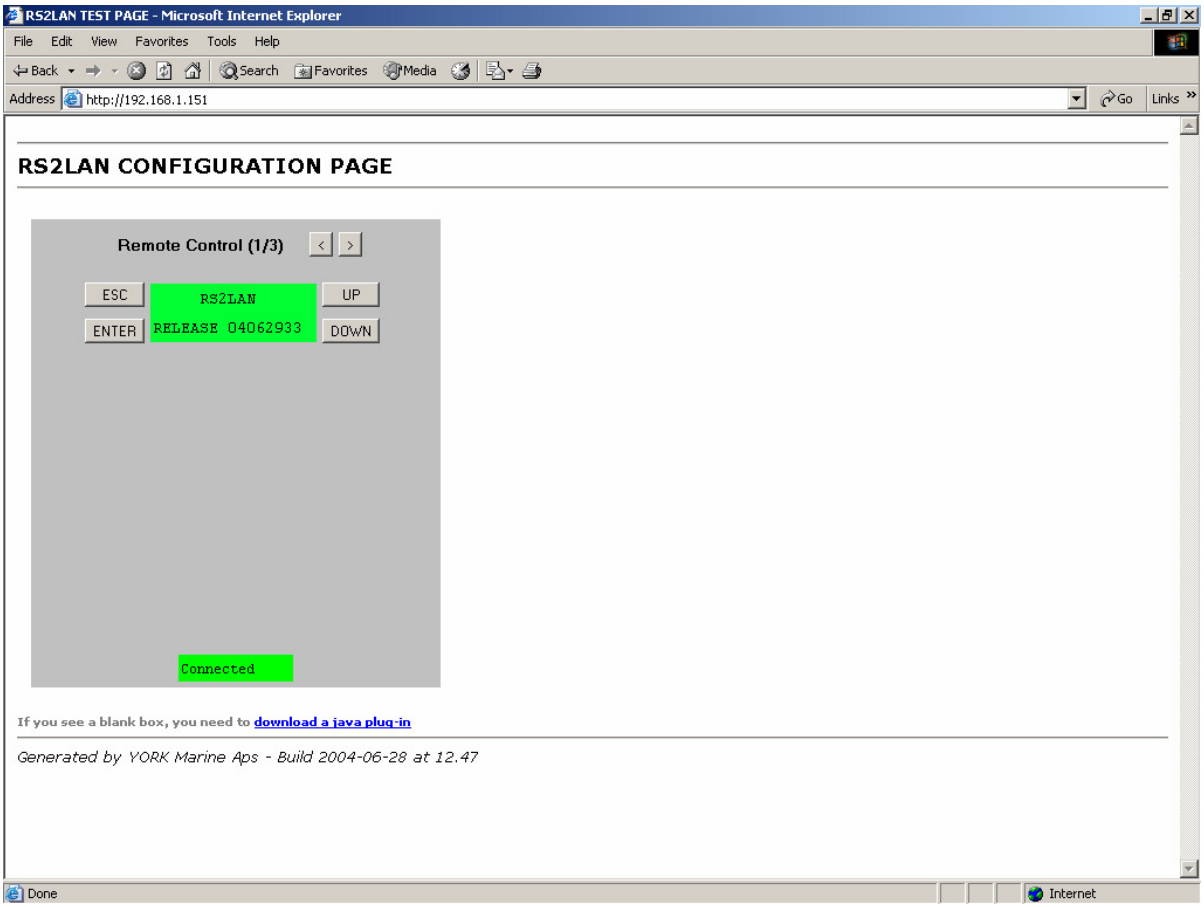
NB: Remember that the subnet and the gateway on the configuration PC must match the actual RS2LAN settings before any configuration changes can be made!

3.3.3 Description of the homepage

The homepage is divided into 3 levels. You can change level by selecting the arrow right and left buttons situated just below the "RS2LAN CONFIGURATION PAGE" title bar.

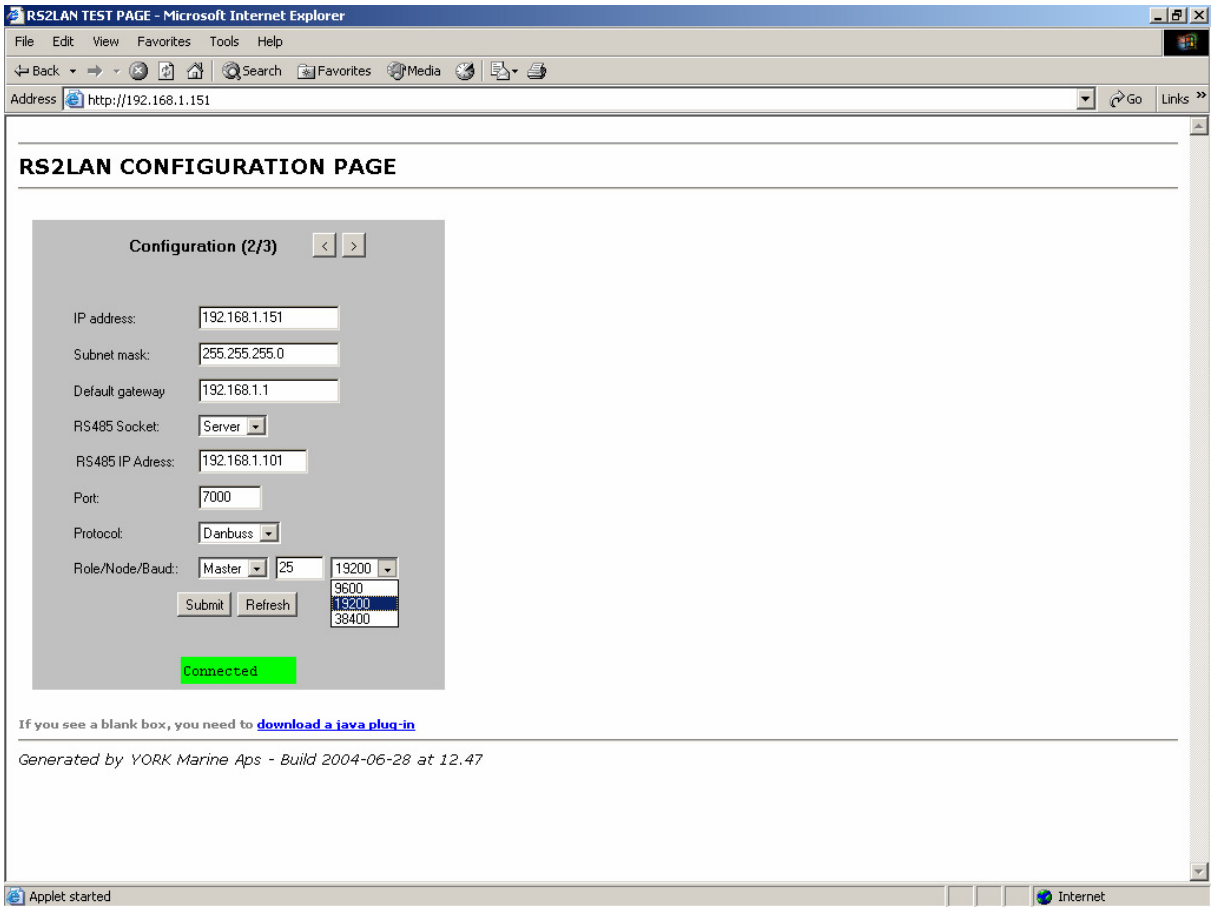
- Level 1
  Here you can configure the RS2LAN, as you would do manually (see RS2LAN User interface (HMI) on page 13). Simply click the buttons instead of using the buttons on the RS2LAN.
- Level 2
  On this page, all settings are shown at once for easy overview. Also you can change settings via the keyboard rather than clicking buttons.
- Level 3
  This page shows information about the RS485 nodes on the network.

3.3.4 Level 1



To connect to the RS2LAN, the PC has to be on the same network.

3.3.5 Level 2



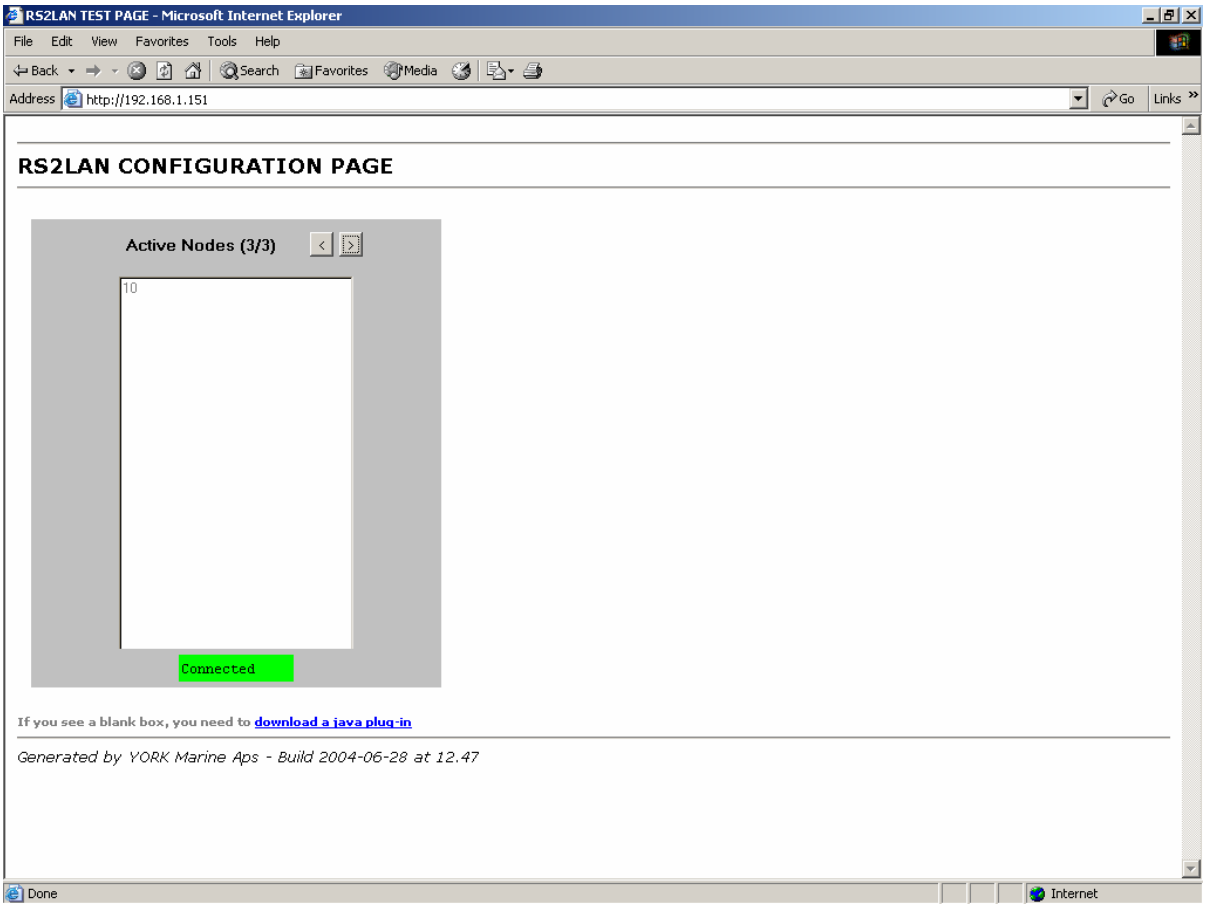
RS485 socket can be Server or Client.

Protocol can be Danbuss or Cpbus.

Role can be Master or Client.

For correct setup please see “3.4 RS2LAN setup” on page 22

3.3.6 Level 3


RS2LAN TEST PAGE - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.1.151
Go Links
RS2LAN CONFIGURATION PAGE
Active Nodes (3/3)
10
Connected
If you see a blank box, you need to download a java plug-in
Generated by YORK Marine Aps - Build 2004-06-28 at 12.47
Done
Internet

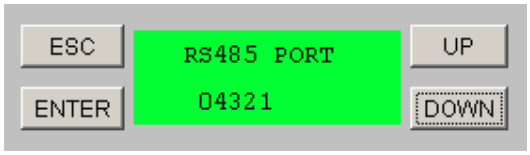
3.4 RS2LAN setup

Let's assume default or factory settings is present.

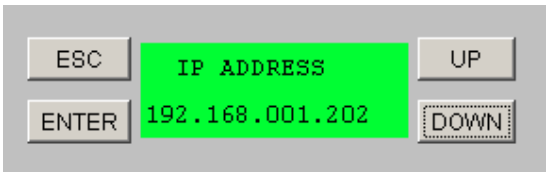
The following setup has to be in the RS2LAN converter

Menu level correspond to the flowchart and explanation in "User Interface" section

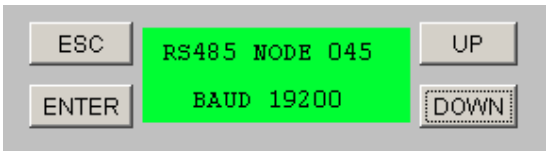
1. Go "Down" in the menus to level 5, set the RS485 port to
   01010 for Net1, 01011 for Net2, 1012 for Net3



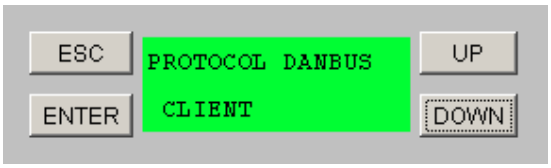
2. Go "Down" to menu level 10, and give the RS2LAN its own **local IP address**
   192.168.0.10 for Net1, 192.168.0.11 for Net2, 192.168.0.12 for Net3



3. Go "Down" to menu level 12, and give the RS2LAN node number **45**



4. Go "Down" to menu level 13, and set the mode to **Client**



Note:

- On startup of the RS2LAN and the OPC_{RS2LAN} driver are no started,
  The RS2LAN will be in **Client mode**.
- If there are UNISAB present on net and the OPC_{RS2LAN} driver are started,
  The RS2LAN will be in **Master UNISAB mode**.
- IF there are no UNISAB present and the OPC_{RS2LAN} driver are started,
  The RS2LAN will be in **Client UNISAB mode**.

Always Remember to SAVE settings after end configuration

4 INSTALLATION OF DRIVER

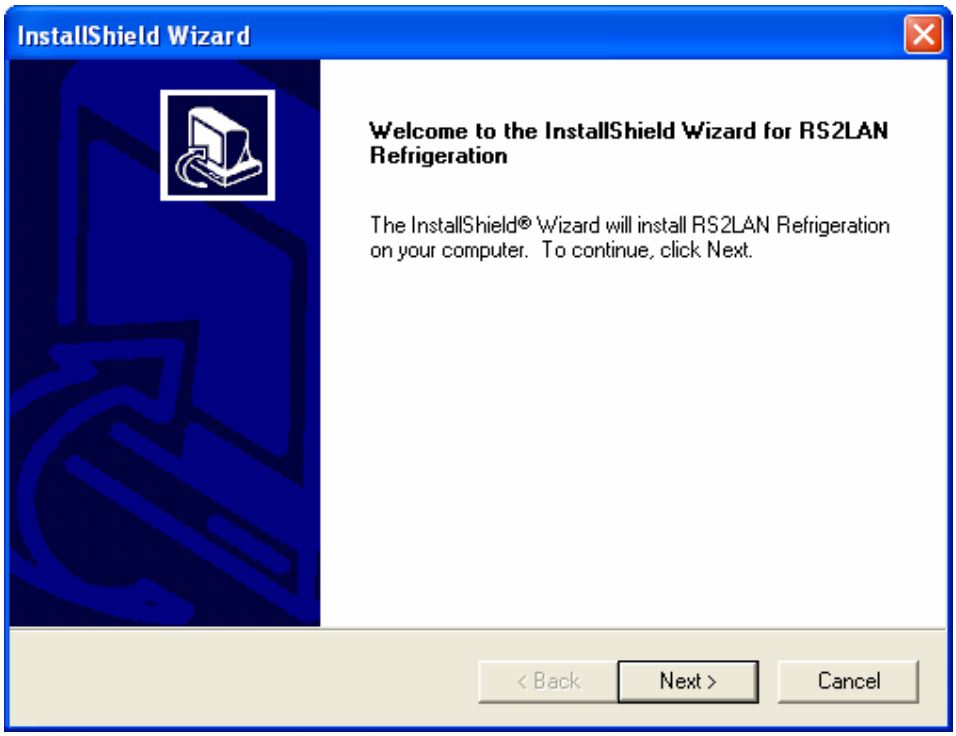
4.1 Installation guide for OPC_{RS2LAN} Server on Windows

System requirements: Windows 2000 professional, Windows XP professional.

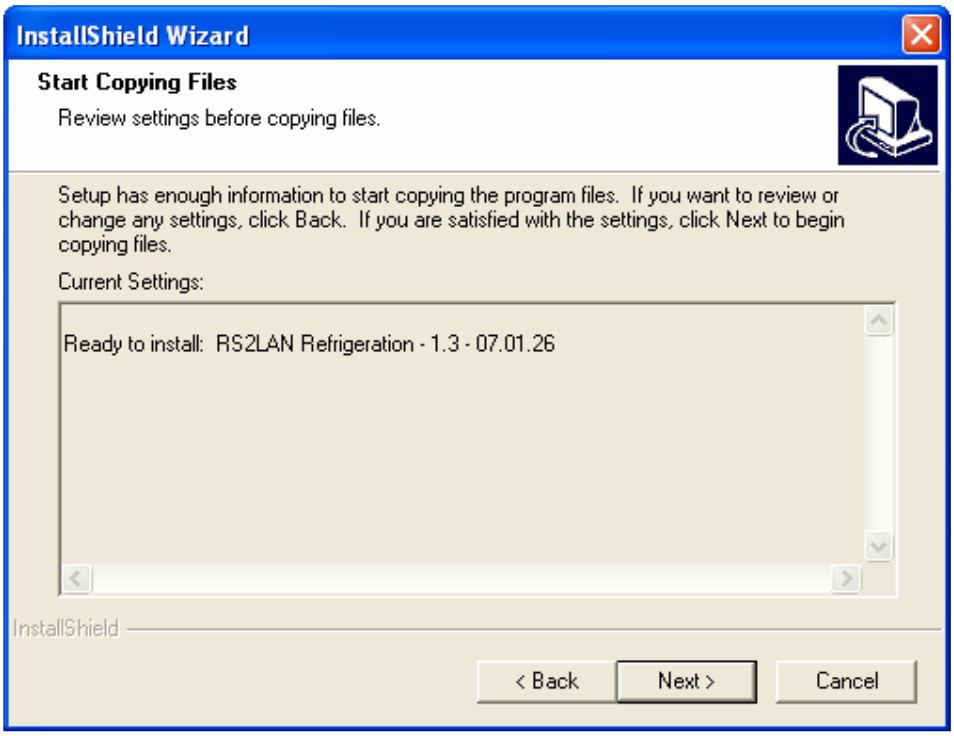
To install the OPC_{RS2LAN} Server on SCADA system (both SABVISUAL and YSAC), please follow these following steps:

Place the Installation CD in your computer. The Installation will start automatically in a few seconds.

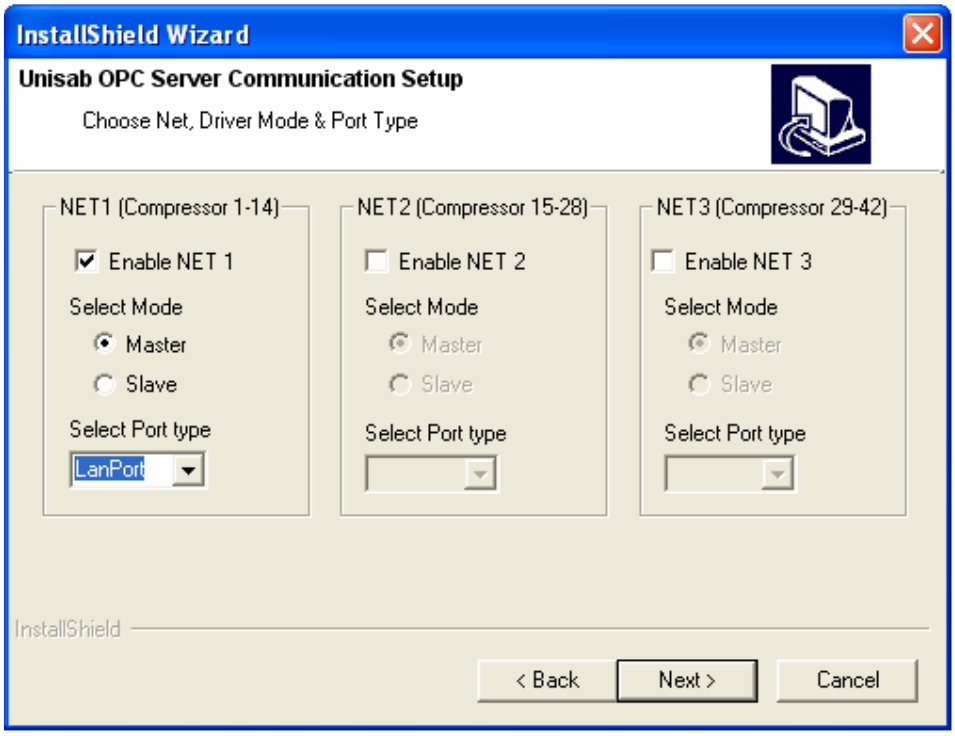
If you all ready have placed the Install CD in your computer and have selected to interrupt the installation. Press "*Start*" button to the lower left on your desktop and select "*Run*" in the menu. Select "Setup.exe" and press OK button. The dialog below appears on the screen.



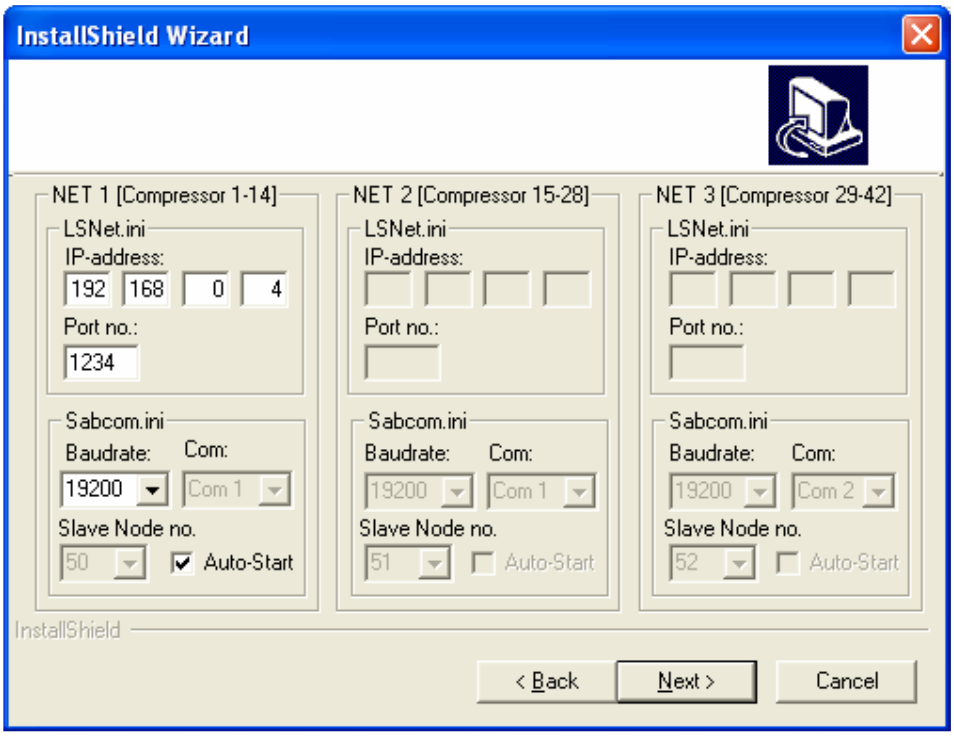
Press the "*Next*" button in this dialog and the dialog on the next page appears on the screen.



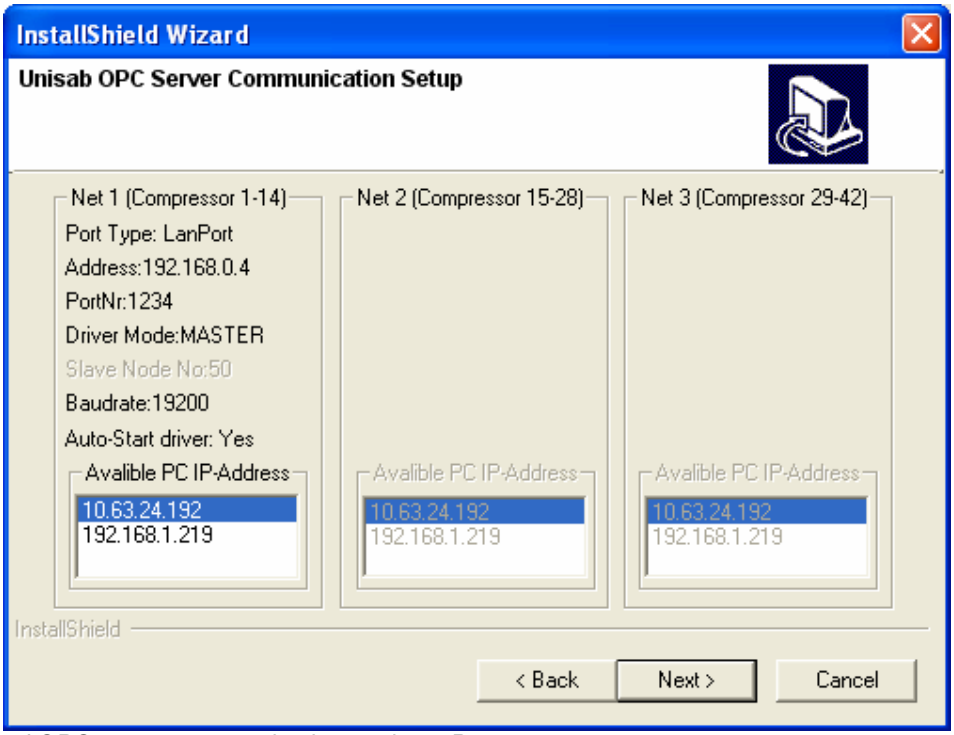
Press the "*Next*" button in this dialog.



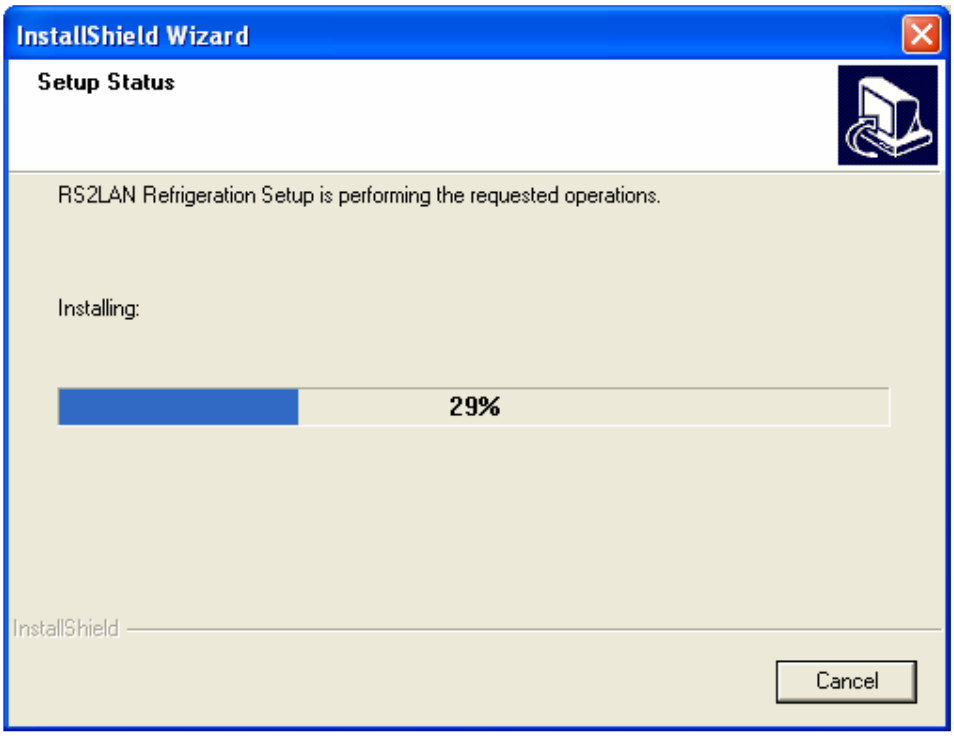
Choose which "NET" you want to enable and select port type, then press next.



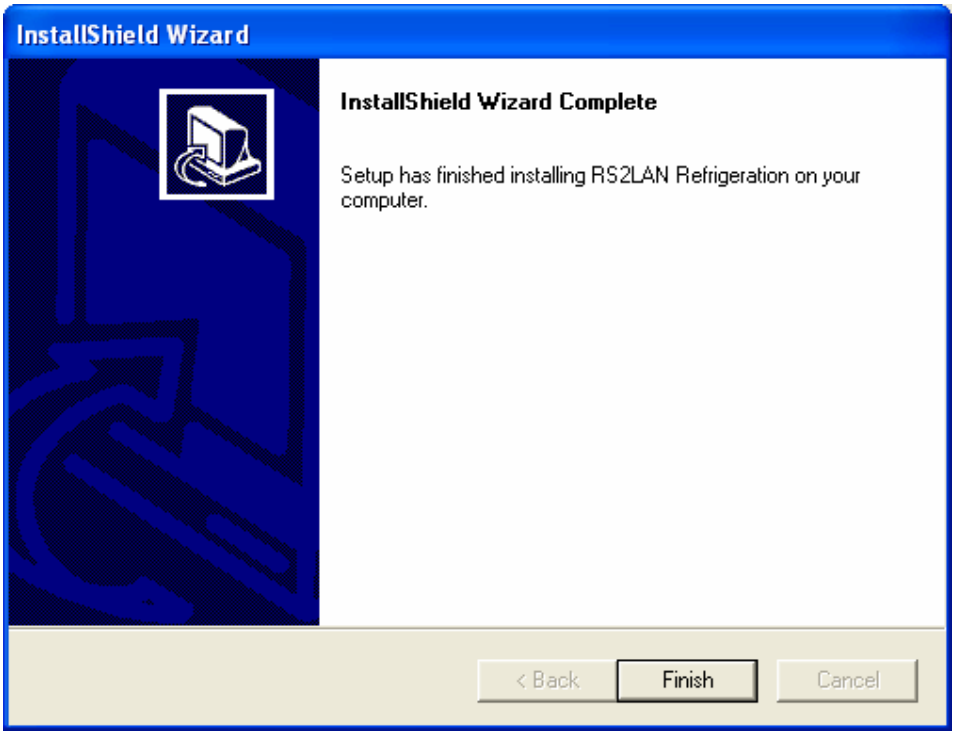
In this dialog box are shown the network setup for the RS2LAN communication. Please press "*Next*" and the dialog below appear in the screen. The IP-address's can be changed, just remember to change the IP-address in the RS2LAN box as well. Further information of the net number please refer to chapter 2.4.3



Summary of OPC server communication settings. Press next.



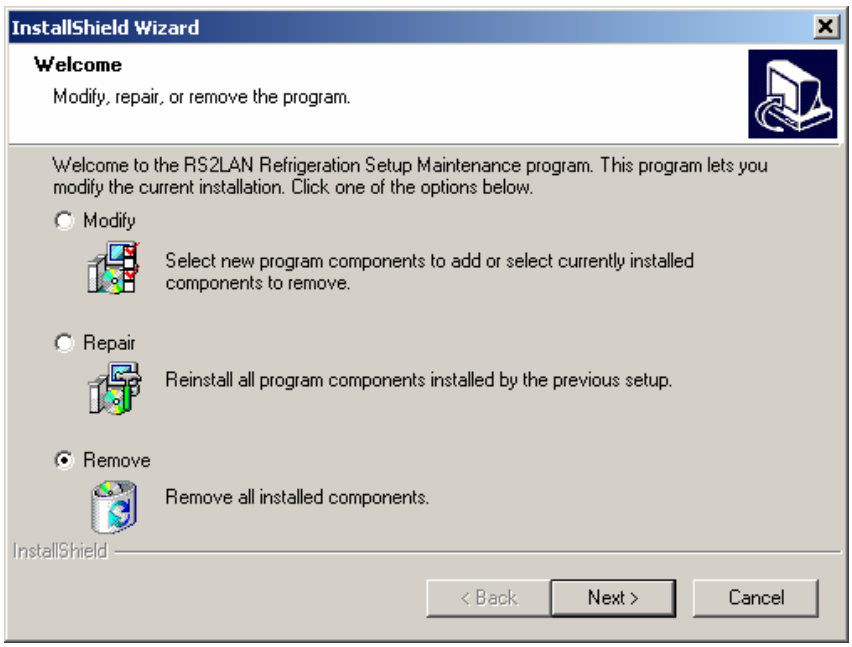
This dialog will be displayed during the whole installation process. The dialog will disappear automatically when the installation is completed. When all the files are installed the dialog below appear on the screen.



Press “Finish” button and your installation are finished.

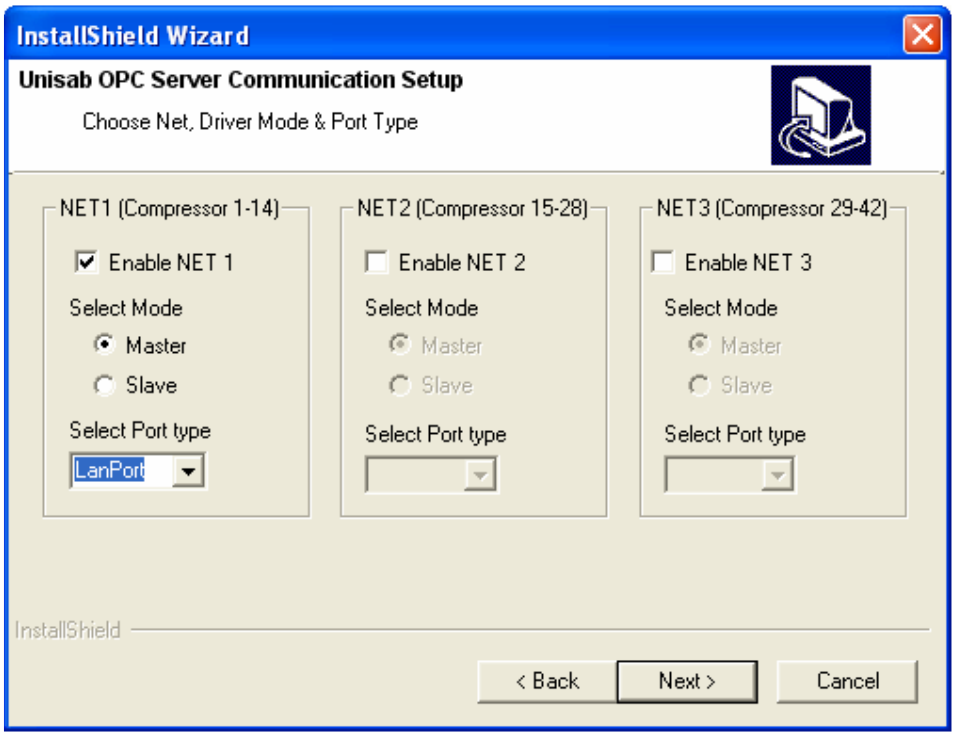
4.2 Modify, Repair and Remove installation

If you run the setup again the dialog below will appear.

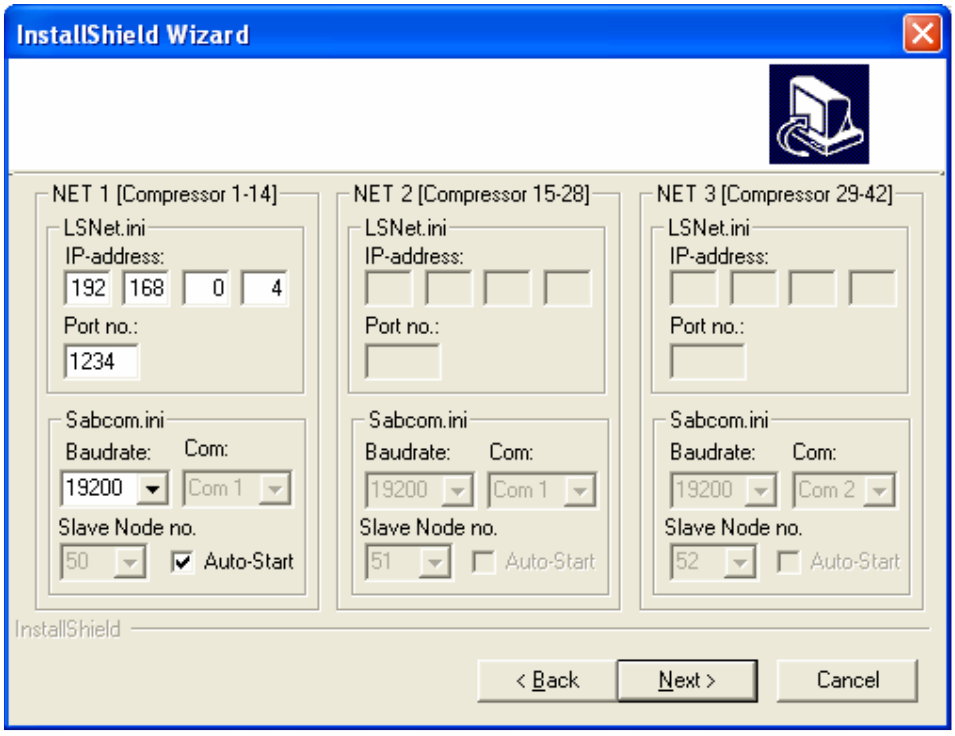


4.2.1 Modify the OPC_{RS2LAN} Server

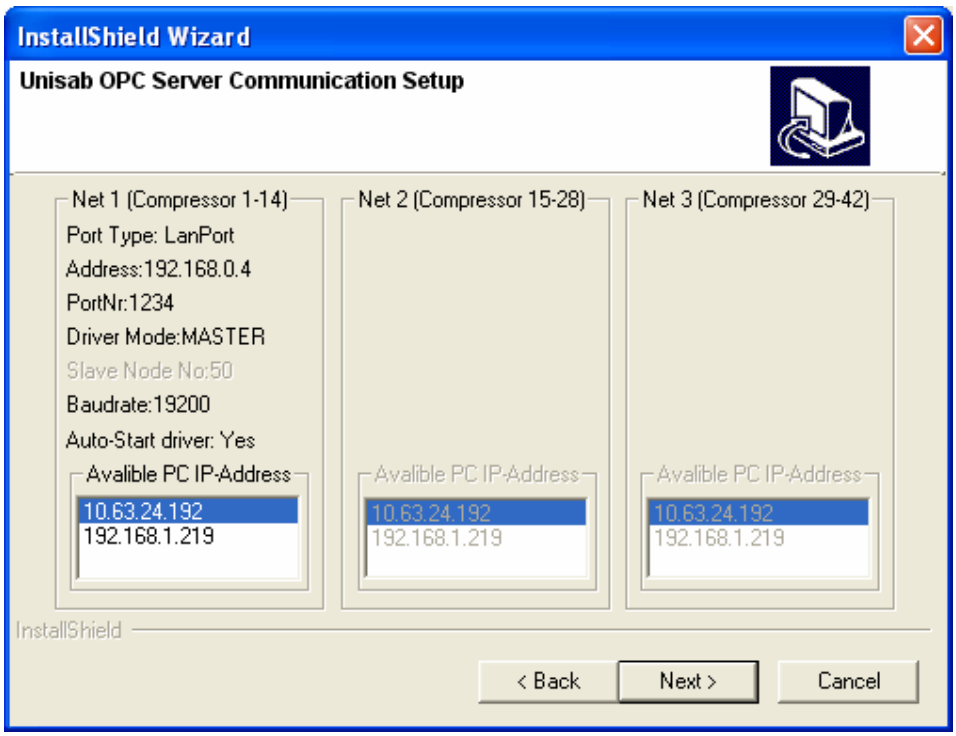
By Choosing the **Modify** you can change the “IP” and “Net” configuration without reinstallation of the OPC_{RS2LAN} Server. The following picture will appear.



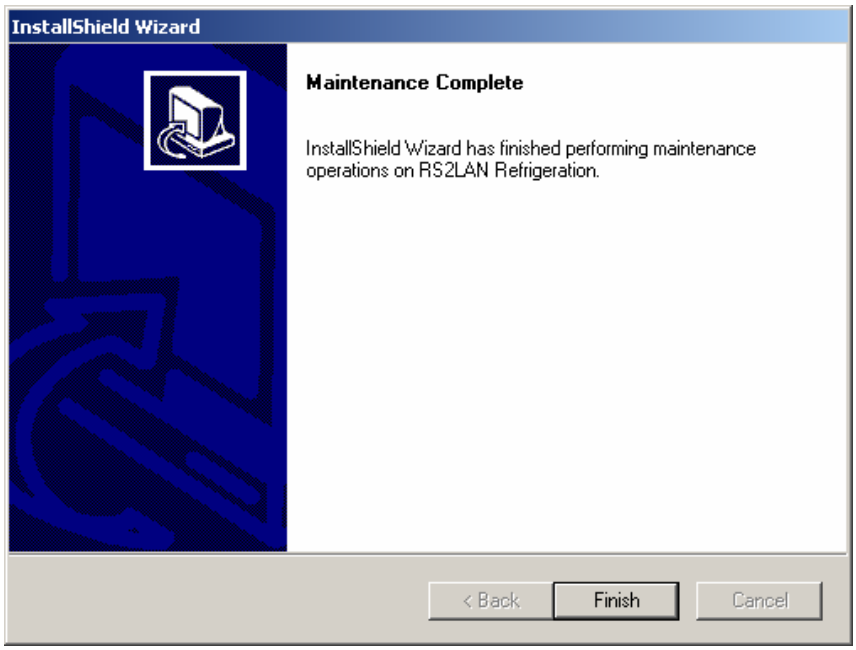
Choose which “NET” you want to enable and select port type, then press next.



In this dialog box are shown the network setup for the RS2LAN communication. Please press "*Next*" and the dialog below appear in the screen. The IP-address's can be changed, just remember to change the IP-address in the RS2LAN box as well. Further information of the net number please refer to chapter 2.4.3



Summary of OPC server communication settings. Press next.



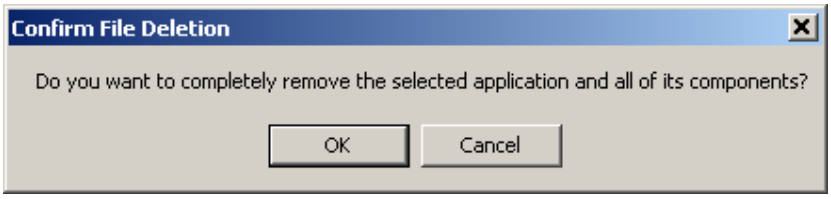
Now the re-configuration of the system is finished, and ready for use.

4.2.2 Repair

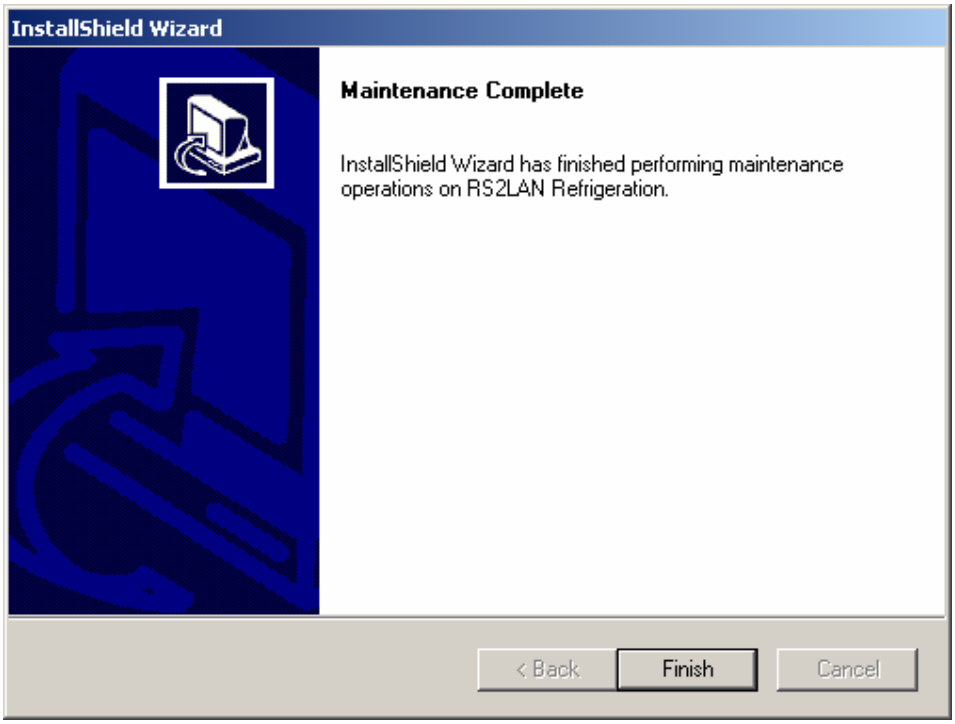
This selection will take you directly to the setup shown in “chapter 4.1 point 3” and reinstall the OPC RS2LAN Server, fore more information please refer to Chapter 4.1 for installation of OPC_{RS2LAN} Server.

4.2.3 Remove

This selection will remove the OPC_{RS2LAN} Server form the PC. The following window will appear.



By choosing the “OK” button, the OPC_{RS2LAN} Server will be removed from the system. When finished the window below will appear.



5 FILES

5.1 File overview

The following files must be located in the same sub-dir: (C:\RS2LAN)

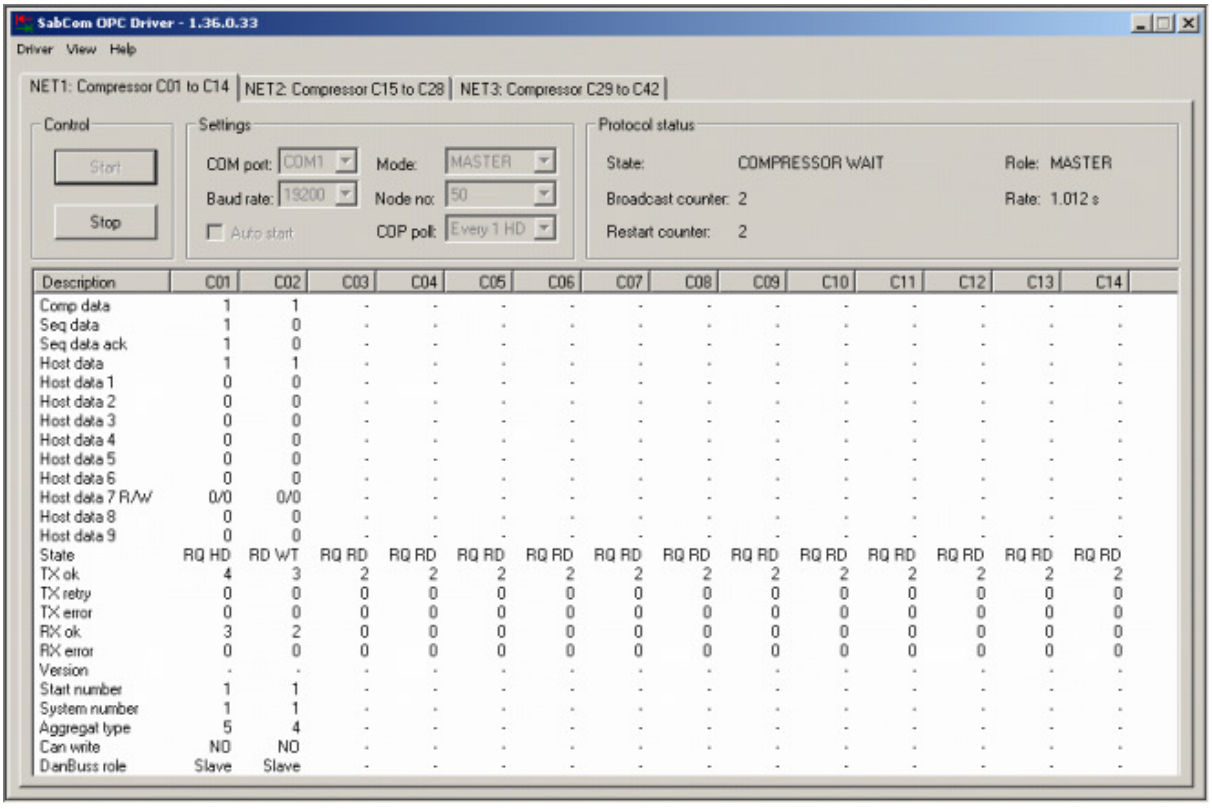
- **LSNet.DLL**
  DanBuss driver DLL
- **SabCom.DLL**
  SabCom driver DLL
- **SabCom.ini**
  SabCom driver configuration file
- **POPCSIf.DLL**
  PACbase OPC_{RS2LAN} Server Interface DLL
- **POPCS.EXE**
  PACbase OPC_{RS2LAN} Server

6 USER INTERFACE

6.1 Starting and running the driver

To start the OPC_{RS2LAN} driver there are two methods. One is to click on the icon  on the desktop or you can use the second method as we recommend if you are using a SCADA system. The second method is; Start the SCADA program and your OPC client will automatically start your OPC_{RS2LAN} driver.
When the driver is started on your computer; there will be three icons displayed on your screen placed in the lower left "taskbar".

To view the OPC interface, right click on the icon with the arrows "green and read" and the dialog below will appear on the screen.



In the field Compressor status you will see the UNISAB's that are connected to your system. In this case two UNISAB's are connected. It is also possible to se whether the communication is running without any TX or RX errors. The driver also shows you what version of software that are installed in the UNISAB's and if the communication is ready for write access.

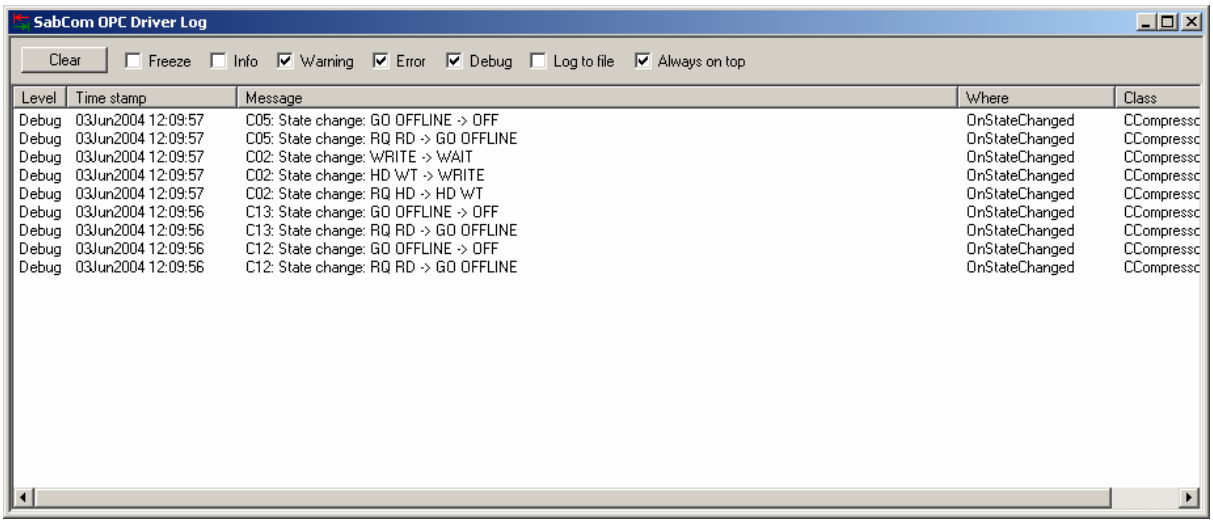
In the control field you can start and stop the driver.

In the setting field you can select or change to another COM port. You can change the COP poll setting, or select another Baud rate. Maximum is 38400 Baud (If supported by the UNISAB II). And you can select that the driver Auto starts when you activate the driver from the desktop or the SCADA system.

In the Protocol status field you got information about the state of the driver; broadcast, waiting, going to be master or restart.
There is a broadcast counter that keeps counting every broadcast. It is a restart counter, which will tell you if the driver has been restarted. The counter is reset when you activate the start button.
The role field telling whether the UNISAB is the master or the driver is the master. When running correctly the driver is master.

6.2 Log file

To trouble shoot. Use the log tool. You can pre watch the log by clicking on "View" -> "Log" in the menu in the driver dialog, the log dialog is shown below.



There are several options according to use the log tool. You can select only to have a preview and not log the data to a text file. In this case do not enable the Log to file check box.

If there are written many errors in the log file, enable the Freeze check box to stop the log.

If you need information about the communication, activate the Info check box.

If you just want to se errors and warnings you need to enable these check boxes.

If you need information about the driver and what the driver is doing you have to activate the Debug check box. In this mode every step he driver take will be written down in the log.

If you need to have a log file you must activate the Log to file check box. This is recommended if you need to be assisted from YORK then you just need to forward the log file and we will have a look on it.

In a normal situation a log to file will not be necessary. Only use this when it is needed.

7 SABCOM INI FILE

7.1 Sabcom INI file Configuration

ComPort: Valid numbers, 1 – 4 (value not used in this configuration)

BaudRate: Valid rate, 9600 - 19200

COPPollRate: Valid values, 1 - 10

The COP data poll rate is used to control how often COP data (host data 9) are fetched compared to host data. Setting a value of zero will prohibit fetching of COP data. Setting a value of 1 will fetch COP data each time host data has been fetched. Setting a value of 3 will kick off a COP data request each time 3 host data requests has been processed.

Notice that COP data isn't fetched unless UNISAB host data bit 6 at byte offset 22 is set.

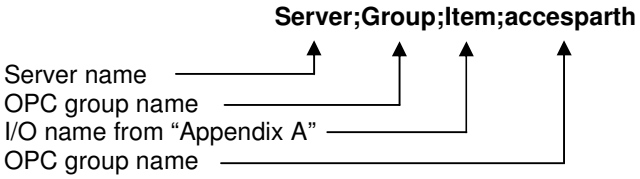
7.1.1 CONFIG EXAMPLE

```
[Config]
ComPort=2
BaudRate=19200
COPPollRate=5
```

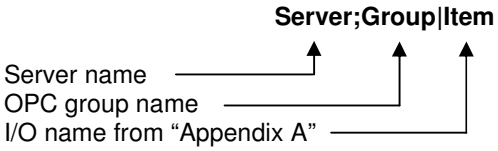
7.2 OPC client setup on SCADA system.

There are two ways to read and write data to the UNISAB II, depending on your OPC client.

If your OPC Client allows you to use an access path, the syntax must be as follows:



If your OPC client does not allow you to use access path, the syntax must be as follows:

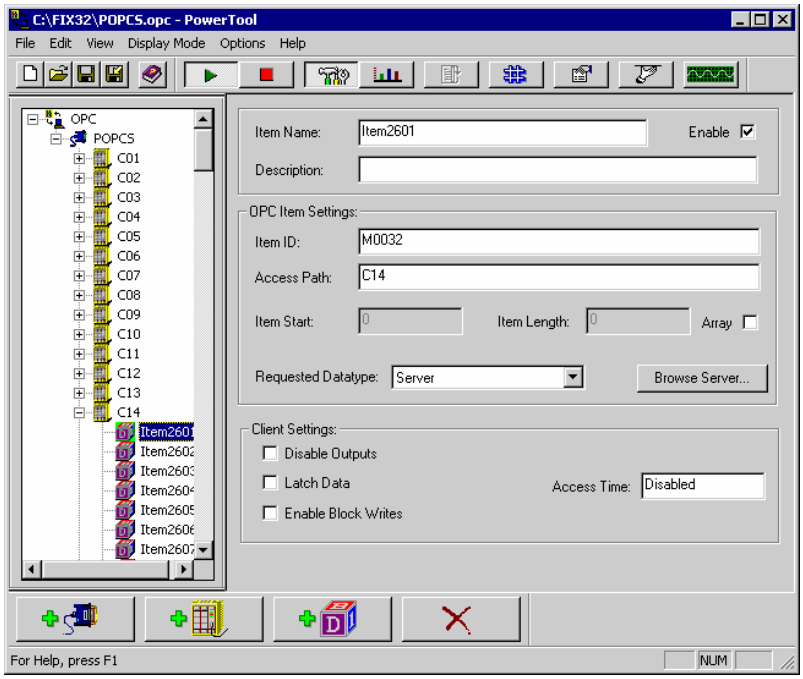


7.2.1 Addressing syntaxes

Syntax examples from picture.

If the OPC Client allow you to use an access path.
POPCS;C14;M0032;C14

If the OPC client does not allow you to use access path.
POPCS;C14|M0032



8 APPENDIX A

Below are all the data points. Offset and length is measured in bytes.

Note the following:

If more information is needed to recognize the data point in the driver, there is a complete list of all accessible points with host addresses in the Sabcom.ini file.

Attention: Any changes in the Sabcom.ini file may cause mail function in the driver. No changes must be done in this file.

8.1 Column names

Data type:

Range: I = Signed data range (-32768 - +32767)
UI = Unsigned data range (0 - 65535)
B = Byte (data range -128 - +127 or 0 - 255)

Parameter Name:

Describes what the this parameter are

I/O Read:

The tag number used on the SCADA system

Write Access:

X: Valid for this control system
X (17): UNISAB II The value can only be written in REMOTE

Unit:

Is an indication of the measuring unit on the tag. number

When Unit says “See table x “ please refer to tables 1-4 on next page

8.1.1 Table 1, Compressor mode (M0062)

Value = 0 => No unit connected
Value = 1 => Ready
Value = 2 => Running
Value = 3 => Starting
Value = 4 => Shutdown
Value = 5 => Pause
Value = 6 => Prelub
Value = 7 => Capacity slide down
Value = 8 => Running - Overload
Value = 9 => Running discharge pressure limitation
Value = 10 => Running suction pressure limitation
Value = 11 => Stopped

8.1.2 Table 2, Compressor control modes (M0063)

Value= 0 => Stopped
Value= 1 => Manual control
Value= 2 => Automatic control
Value= 3 => Remote control

8.1.3 Table 3, Control system (M0066)

Value = 0 => No system
Value = 1 => Prosab II
Value = 2 => UNISAB, recip. compressor
Value = 3 => UNISAB, screw compressor
Value = 4 => UNISAB II, rotatune recip. compressor
Value = 5 => UNISAB II, rotatune screw compressor

8.1.4 Table 4, Mulitsab state (M0067)

Value = 0 => No permission to start
Value = 1 => Do not start (1)
Value = 2 => May start (1)
Value = 3 => Runs at 100% capacity
Value = 4 => Lead compressor
Value = 5 => Lag compressor
Value = 6 => Stopping
Value = 7 => Runs, but without Lead-Lag control
Value = 8 => Stopping – Ramps capacity up
Value = 9 => Stopping – Ramps capacity down
Value = 10 => Rotatune Master
Value = 11 => Rotatune Slave.

Note:
(1) Mulitsab state mode 1 and 2 are reversed in prosab II

8.2 Common read/write points

Decimals	Parameter Name	I/O Read	Write Access	Unit
I	Suction gas temp	M0032		℃
I	Discharge gas temp.	M0033		℃
I	Oil temp.	M0034		℃
I	Suction pressure	M0035		BAR
I	Discharge pressure	M0036		BAR
I	Suction pressure	M0037		'C/R
I	Discharge pressure	M0038		'C/R
I	Capacity position	M0039		%
I	Volume slide position (s)	M0040		%
I	Motor current	M0041		Amp/kW
I	*External input*	M0042		%
I	Oil filter diff. pressure (s) / Intermediate pressure (r)	M0043		BAR
I	Suction gas superheat	M0044		℃
I	Brine / intermediate temperature	M0045		℃
UI	Running hours	M0046		Hours
I	Oil pressure	M0047		BAR
B	Compressor mode	M0062		See table 1
B	Compressor control mode	M0063	X	See table 2
B	Sequence start number	M0064	X	0-14
B	System number	M0065	X	1-14
B	Ctrl. system (aggregate type)	M0066		See table 3
B	Multisab State	M0067		See table 4
B	Preceding compressor	M0068		1-14
B	Next compressor	M0069		1-14
B	Compressor to follow the next	M0070		1-14
B	Selected sys regulator	M0071		1-14
I	Liquid temperature T3	M0073	X	℃

Decimals	Parameter Name	I/O Read	Write Access	Unit
		M0080		
	Warnings			
	0: High ext. input	X:0		
	1: High oil pressure	X:1		
	2: High difference pressure	X:2		
	3: High intermediate pressure	X:3		
	4: Low ext. input	X:4		
	5: Low pressure gas superheat	X:5		
	6: High suction pressure	X:6		
	7: Low intermediate pressure	X:7		
	Alarms			
	8: High ext. input	X:8		
	9: High oil pressure	X:9		
	10: High difference pressure	X:10		
	11: High intermediate pressure	X:11		
	12: Low ext. input	X:12		
	13: Low pressure gas superheat	X:13		
	14: Vi-position	X:14		
	15: Low intermediate pressure	X:15		
		M0081		
	Alarms (Reciprocating / Screw)			
	High Alarm			
	0: not used	X:0		
	1: Brine-/ Intermediate gas-temp.	X:1		
	2: Oil temperature	X:2		
	3: Discharge temperature	X:3		
	4: Suction Gas superheat.	X:4		
	5: Intermediate pressure / MKD scr: start perm. err [1]	X:5		
	6: Oil filter diff. pressure	X:6		
	7: Discharge pressure	X:7		
	Low Alarm			
	8: Brine-/ Intermediate gas-temp.	X:8		
	9: Oil temperature	X:9		
	10: Discharge temperature	X:10		
	11: Suction Gas superheat.	X:11		
	12: Intermediate pressure / MKD scr: start perm. err [1]	X:12		
	13: Oil pressure	X:13		
	14: Discharge pressure	X:14		
	15: Suction pressure	X:15		

[1] Not implanted in UNISAB II – only in PCComsabII, ComsabII and PC Service

Decimals	Parameter Name	I/O Read	Write Access	Unit
	Digital alarms	M0082		
	0: Evolution: PLC common err	X:0		
	1: Evolution: PLC alm Tr.mit	X:1		
	2: Dish. pressure overloading	X:2		
	3: Diagnose EEPROM failure	X:3		
	4: Cooling fan failure	X:4		
	5: PMS failure	X:5		
	6: Full-flow pump failure	X:6		
	7: Oil pump failure	X:7		
	8: Com. error to chiller	X:8		
	9: Chiller, common alarm	X:9		
	10: Comp. motor overload	X:10		
	11: Oil flow failure	X:11		
	12: Cap. failure	X:12		
	13: (Fatal error)	X:13		
	14: Motor failure	X:14		
	15: Thermal failure	X:15		
	Warnings (Reciprocating / Screw)	M0083		
	High warning			
	0: not used/High motor current	X:0		
	1: Brine-/ Intermediate gas-temp.	X:1		
	2: Oil temp.	X:2		
	3: Discharge temp	X:3		
	4: Suction gas superheat.	X:4		
	5: Intermediate pressure	X:5		
	6: Oil filter diff. pressure	X:6		
	7: Discharge pressure	X:7		
	Low warning			
	8: Brine-/ Intermediate gas-temp.	X:8		
	9: Oil temp.	X:9		
	10: Discharge temp.	X:10		
	11: Suction gas superheat.	X:11		
	12: Intermediate pressure	X:12		
	13: Oil pressure	X:13		
	14: Discharge pressure	X:14		
	15: Suction pressure	X:15		
	Digital warnings	M0084		
	6: Limiting suction pressure	X:6		
	7: Limiting discharge pressure	X:7		
	8: Limiting Brine	X:8		
	9: Limiting hot water	X:9		
	10: Oil boil out error	X:10		
	11: Evolution menu not ready	X:11		
	12: Limiting discharge temperature	X:12		
	13: Attention on pre-lubricate pressure	X:13		
	14: Not allowed to start	X:14		
	15: Wrong number in start sequence	X:15		

Decimals	Parameter Name	I/O Read	Write Access	Unit
B	Switch reg. SP1/ SP2	M0085		0-1
I	Set point actual, suction pressure	M0086		°C/R
I	Set point 1, suction pressure	M0087	X	°C/R
I	Set point 2, suction pressure	M0088	X	°C/R
I	NZ, Suction pressure	M0089	X	°C/R
I	P Band, suction pressure	M0090	X	°C/R
I	Set point actual, brine temp.	M0091		°C
I	Set point 1, brine temp	M0092	X	°C
I	Set point 2, brine temp.	M0093	X	°C
I	N Zone, brine temp.	M0094	X	°C
I	P Band, brine temp	M0095	X	°C
I	Set point actual, discharge pressure	M0096		°C/R
I	Set point 1, discharge pressure	M0097	X	°C/R
I	Set point 2, discharge pressure	M0098	X	°C/R
I	N Zone, discharge pressure	M0099	X	°C/R
I	P Band, discharge pressure	M0100	X	°C/R
I	Set point actual, external	M0101		%
I	Set point 1, external input	M0102	X	%
I	Set point 2, external input	M0103	X	%
I	N Zone, external input	M0104	X	%
I	P band, external input	M0105	X	%
I	Set point 1, oil pressure	M0106	X	BAR
I	Set point 2, oil pressure	M0107	X	BAR
B	Switch motor SP1/ SP2	M0108		0-1
I	Set point 1, motor current	M0109	X	Amps
I	Set point 2, motor current	M0110	X	Amps
B	Ext. starting permission - normal	M0111		0-1
B	Ext. starting permission - instant	M0112		0-1
B	Start request OK (PMS)	M0113		0-1
I	Set point 1, oil temp. - Cooling	M0114	X	°C
I	Set point 2, oil temp. - Heating	M0115	X	°C

Decimals	Parameter Name	I/O Read	Write Access	Unit
I	N Zone, oil temp.	M0116	X	℃
I	P band, oil temp.	M0117	X	℃
I	Set point 1, suction gas superheat	M0118	X	℃
I	Set point 1, discharge gas temp.	M0119	X	℃
I	Set point 1, volume-slide	M0120	X	%
UI	Run time since last start (low)	M0121		Sec.
I	Set point 1, capacity	M0122	X	%
I	N. zone, capacity	M0123	X (17)	%
I	P. band, capacity	M0124	X (17)	%
B	BIT 00: Remote Cap. Ctrl	M0125		0-1
I	Software version (xx.xx)	M0127		
I	Cooling power {129} [I]	M0129		
I	Start-start delay	M0130	X	Sec.
I	Stop-start delay	M0131	X	Sec.
I	Delay before start	M0132	X	Sec.
I	Delay before stop	M0133	X	Sec.
I	Suction pressure ramp function	M0134	X	-
I	Slide max down time (s)/ Delay up (r)	M0135	X	-
I	Pre-lubrication (s)/ Delay down (r)	M0136	X	-
I	Oil flow switch active (s)/ Take over max. time (r)	M0137	X	-
I	Oil flow switch delay (s)/ Take over delay (r)	M0138	X	-
I	Oil flow max. drop out /(s) M-press. (r)	M0139	X	-
I	Lubrication time after start (s)/ Not used (r)	M0140	X	-
I	Difference pressure OK (s)/ Not used (r)	M0141	X	-
I	Oil pressure low - delay	M0142	X	-
I	Oil filter diff. Press. High (s)/ Oil pressure high (r)	M0143	X	-
I	Oil temperature low	M0144	X	-
I	Oil temperature high	M0145	X	-
I	Superheat low	M0146	X	-
I	Superheat high	M0147	X	-

Decimals	Parameter Name	I/O Read	Write Access	Unit
I	Discharge pressure overload	M0148	X	-
I	Motor current overload	M0149	X	-
I	Compressor Motor starting time	M0150	X	-
I	PMS feedback	M0151	X	-
I	Full flow pump starting time (s)/ Oil cool on (r)	M0152	X	-
I	Oil pump starting time (s)/ Oil return (r)	M0153	X	-
I	Oil rectifier start	M0154	X	-
I	Oil rectifier delay	M0155	X	-
I	Oil rectifier suppress	M0156	X	-
I	Start high pressure compressor	M0157	X	-
I	Communication delay	M0158	X	-
I	Capacity negative	M0159	X	-
B	P. Band factor, start delay	M0160	X	1-10
B	P. Band factor, stop delay	M0161	X	1-10
B	P. Band factor, delay up (r)	M0162	X	1-10
B	P. Band factor, delay down (r)	M0163	X	1-10
B	Transfer factor, delay down (r)	M0164	X	1-10
	Transfer zone, delay down (r)	M0165	X	%
B	Take over factor, delay up (r)	M0166	X	1-10
B	Take over factor, start delay (r)	M0167	X	1-10
	Take over zone, delay up	M0168		
B	Compressor type	M0170	X	1-45
B	Refrigerant type	M0171	X	1-10
B	Regulation mode	M0172	X	1-6
B	Vi-control mode	M0173	X	0-1
B	Automatic start	M0174	X	0-1
B	Automatic stop	M0175	X	0-1
B	Pre-lubrication	M0176	X	0-1
B	Full-flow pump	M0177	X	0-1
B	Booster	M0178	X	0-1
B	Compressor no.	M0179	X	0-14

Decimals	Parameter Name	I/O Read	Write Access	Unit
B	Regulation master choice	M0180	X	0-1
B	Economizer	M0181	X	0-1
I	Economizer min. capacity	M0182	X	%
I	Economizer max. suction pressure	M0183	X	℃/R
B	Common evaporator/condenser	M0184	X	0-3
B	HP compressor on two stage	M0185	X	0-1
B	Discharge cooling	M0186	X	0-1
B	Oil cooling type	M0187	X	0-4
I	Motor current range	M0188	X	Amps
	Swept volume	M0189	X	m3/h
B	Cold store control	M0190	X	0-1
B	Out door temp. compensation	M0191	X	0-1
B	Total unload	M0192	X	0-1
I	Baud rate	M0193	X	baud
B	Oil rectifier	M0194	X	0-1
B	Euro./US units	M0195	X	0-1
B	Factory reset	M0196	X	0-1
B	Evolution	M0197	X	0-1
B	Aux. Analogue input function	M0199	X	0-6
I	Cap. lim. Low	M0201	X	%
I	Cap. lim. High	M0202	X	%
B	Man. Zero	M0203		%
I	Suction pressure: limits-high alarm	M0204	X	BAR
I	- - -high warning	M0205	X	BAR
I	- - -low warning	M0206	X	BAR
I	- - -low alarm	M0207	X	BAR
I	Discharge pressure: limits-high alarm	M0208	X	BAR
I	- - -high warning	M0209	X	BAR
I	- - -low warning	M0210	X	BAR
I	- - -low alarm	M0211	X	BAR
I	Oil pressure: limits-high alarm	M0212	X	BAR

Decimals	Parameter Name	I/O Read	Write Access	Unit
I	- - -high warning	M0213	X	BAR
I	- - -low warning	M0214	X	BAR
I	- - -low alarm	M0215	X	BAR
I	Oil filter diff. Press. Limits (s) / Interm. Press. Limits (r):-high alarm	M0216	X	BAR
I	- - -high warning	M0217	X	BAR
I	- - -low warning	M0218	X	BAR
I	- - -low alarm	M0219	X	BAR
I	Discharge Temp. limits-high alarm	M0224	X	℃
I	- - -high warning	M0225	X	℃
I	- - -low warning	M0226	X	℃
I	- - -low alarm	M0227	X	℃
I	Oil temp. limits-high alarm	M0228	X	℃
I	- - -high warning	M0229	X	℃
I	- - -low warning	M0230	X	℃
I	- - -low alarm	M0231	X	℃
I	Brine temp. (a) limits / Interm. Temp (b) limits-high alarm	M0232	X	℃
I	- - -high warning	M0233	X	℃
I	- - -low warning	M0234	X	℃
I	- - -low alarm	M0235	X	℃
I	Suction gas superheat: -high alarm	M0236	X	℃
I	- - -high warning	M0237	X	℃
I	- - -low warning	M0238	X	℃
I	- - -low alarm	M0239	X	℃
I	Discharge gas superheat:-high alarm	M0240	X	℃
I	- - -high warning	M0241	X	℃
I	- - -low warning	M0242	X	℃
I	- - -low alarm	M0243	X	℃
I	External input limits-high alarm	M0244	X	%
I	- - -high warning	M0245	X	%
I	- - -low warning	M0246	X	%
I	- - -low alarm	M0247	X	%

Decimals	Parameter Name	I/O Read	Write Access	Unit
I	Suction pressure limits-high alarm	M0248	X	°C/R
I	- - -high warning	M0249	X	°C/R
I	- - -low warning	M0250	X	°C/R
I	- - -low alarm	M0251	X	°C/R
I	Discharge pressure limits-high alarm	M0252	X	°C/R
I	- - -high warning	M0253	X	°C/R
I	- - -low warning	M0254	X	°C/R
I	- - -low alarm	M0255	X	°C/R
	Keyboard code	M0276		
B	Suction system regulator			
	Swept volume			
B	Reg. Mast. ch. speed 0-100%			
B	Up/down regulation flag			
B	New data flag			
B	Comp control status			
	Discharge gas superheat			
	Digital input bits: <u>Common (Screw and Recip.)</u> 0: Motor starter feedback 1: Ext. start: Norm. stop 2: Ext. start: Immediate stop 3: Start req. OK (PMS) 4: Use SP1/SP2 5: Use motor current limit 1 or 2 9: Capacity down blocked 10: Thermal in motor windings <u>Screw</u> 6: Oil pump MS FB 7: Full flow pump MS FB 8: Oil flow switch <u>Reciprocating</u> 6: Interm. pressure oil separator 7: High. pressure oil separator 8: Not used	M0260 M0111 M0112 M0113 M0085 M0108		

Decimals	Parameter Name	I/O Read	Write Access	Unit
	Digital output bits: Common (Screw and Recip.) 10: Heating element 11: Alarm 12: Warning 13: Aux. output 14: Starting req. (PMS) 15: Comp. motor start signal Screw 0: Capacity down 1: Capacity up 2: Volume down 3: Volume up 4: Economizer – suction line 5: Economizer – liquid line 6: Oil cooling (HLI/BLI) 7: Oil cooling (Not HLI/BLI) 8: Oil distribution pipe 9: Oil rectifier Reciprocating 0: Capacity stage no 1 1: Capacity stage no 2 2: Capacity stage no 3 3: Capacity stage no 4 4: Capacity stage no 5 5: Capacity stage no 6 6: Capacity stage no 7 7: Oil cooling 8: Oil return 9: Water cooling	M0261		
	Digital output bits: (continue) Screw 0: Prelub. pump start signal 1: Full flow pump start signal Reciprocating 0: Oil rectifier 1: Not used	M0262		
	Analogue input 1 (A/D pressure)			
	Analogue input 2 (A/D pressure)			
	Analogue input 3 (A/D pressure)			
	Analogue input 4 (A/D pressure)			
	Analogue input 1 (A/D temp.)			
	Analogue input 2 (A/D temp.)			

Decimals	Parameter Name	I/O Read	Write Access	Unit
	Analogue input 3 (A/D temp.)			
	Analogue input 4 (A/D temp.)			
	Analogue input 1 (A/D current)			
	Analogue input 2 (A/D current)			
	Analogue input 3 (A/D current)			
	Analogue input 4 (A/D current)			
	Analogue input (Thermistor)			
	Calibrate value - suction pressure			
	Calibrate value - discharge pressure			
	Calibrate value - oil pressure			
	Calibrate value - oil diff. pressure			
	Calibrate value - interm. pressure			
	Keyboard enabled			
	Compressor serial no. (low) [2]			
	Compressor serial no. (high) [2]			
I	COP {126} [I]	700		
I	COP Carnot [F*0.01]	701		
I	COP Mech. [F*0.01]	702		
I	Cooling power	703		kW
I	Mass flow {128} [I]	704		Kg/h
I	Shaft power [I]	705		kW
I	Motor performance [I]	706		
I	Volume flow [I]	707		M3/h
I	Superheat spec. vol. [I]	708		KJ/kg
I	Saturation spec. vol. [I]	709		KJ/kg
I	Enthalpy H1 [I]	710		
I	Enthalpy H4 [I]	711		
I	Enthalpy H2 [I]	712		

[2] Not used

Decimals	Parameter Name	I/O Read	Write Access	Unit
	Active reg. (witch reg. is active)	--		
	Stop reason	---		
	Start reason	---		
	Aggregate type UNISAB II	---		
	*Changes in block 0-7 **)*	---		
	Not used	---		
	Run time s. since last start (high)	---		
	---	---		
	---	---		
B	---	---		
	---	---		
B	---	---		
	Contrast	---		
B	Aux. Digital output function	---		
B	Mech. Zero	---		
	---	---		
	---	---		
	---	---		
	---	---		
	---	---		
	---	---		

8.3 Evolution read/write points

Decimals	Parameter Name	I/O Read	Write Access	Unit
I	Evolution Read 1	M0310		User defined
I	Evolution Read 2	M0311		User defined
I	Evolution Read 3	M0312		User defined
I	Evolution Read 4	M0313		User defined
I	Evolution Read 5	M0314		User defined
I	Evolution Read 6	M0315		User defined
I	Evolution Read 7	M0316		User defined
I	Evolution Read 8	M0317		User defined
I	Evolution Read 9	M0318		User defined
I	Evolution Read 10	M0319		User defined
I	Evolution Read 11	M0320		User defined
I	Evolution Read 12	M0321		User defined
I	Evolution Read 13	M0322		User defined
I	Evolution Read 14	M0323		User defined
I	Evolution Read 15	M0324		User defined
I	Evolution Read 16	M0325		User defined
I	Evolution Read 17	M0326		User defined
I	Evolution Read 18	M0327		User defined
I	Evolution Read 19	M0328		User defined
I	Evolution Read 20	M0329		User defined
I	Evolution Read 21	M0330		User defined
I	Evolution Read 22	M0331		User defined
I	Evolution Read 23	M0332		User defined
I	Evolution Read 24	M0333		User defined
I	Evolution Read 25	M0334		User defined

Decimals	Parameter Name	I/O Read	Write Access	Unit
I	Evolution Read 26	M0335		User defined
I	Evolution Read 27	M0336		User defined
I	Evolution Read 28	M0337		User defined
I	Evolution Read 29	M0338		User defined
I	Evolution Read 30	M0339		User defined
I	Evolution Read 31	M0340		User defined
I	Evolution Read 32	M0341		User defined
B	Evolution write 1	M0350	X	User defined
B	Evolution write 2	M0351	X	User defined
B	Evolution write 3	M0352	X	User defined
B	Evolution write 4	M0353	X	User defined
B	Evolution write 5	M0354	X	User defined
B	Evolution write 6	M0355	X	User defined
B	Evolution write 7	M0356	X	User defined
B	Evolution write 8	M0357	X	User defined
B	Evolution write 9	M0358	X	User defined
B	Evolution write 10	M0359	X	User defined
B	Evolution write 11	M0360	X	User defined
B	Evolution write 12	M0361	X	User defined
B	Evolution write 13	M0362	X	User defined
B	Evolution write 14	M0363	X	User defined
B	Evolution write 15	M0364	X	User defined
B	Evolution write 16	M0365	X	User defined
B	Evolution write 17	M0366	X	User defined
B	Evolution write 18	M0367	X	User defined
B	Evolution write 19	M0368	X	User defined
B	Evolution write 20	M0369	X	User defined

Decimals	Parameter Name	I/O Read	Write Access	Unit
B	Evolution write 21	M0370	X	User defined
B	Evolution write 22	M0371	X	User defined
B	Evolution write 23	M0372	X	User defined
B	Evolution write 24	M0373	X	User defined
B	Evolution write 25	M0374	X	User defined
B	Evolution write 26	M0375	X	User defined
B	Evolution write 27	M0376	X	User defined
B	Evolution write 28	M0377	X	User defined
B	Evolution write 29	M0378	X	User defined
B	Evolution write 30	M0379	X	User defined
B	Evolution write 31	M0380	X	User defined
B	Evolution write 32	M0381	X	User defined

Document Revision Record

Rev.	Date	Author	Brief description of change	Pages affected
1.0	041130	CNJ	Original issue	All
1.1	050124	CNJ	mulitsab description changed	36
1.2	060209	SM	New release	All
1.3	060323	SM	Correction regarding power supply. Changed from 24V ac to 24V ac/dc	6,7,8
1.4	070126	SOM	J3 (RJ45 connecter) has been set to:NotUsed	Most