LYNXTechnik AG®

Broadcast Television Equipment

Reference Manual

R CT 5031

Master Controller with TCP/IP Interface and Control Software

Revision 2.0 - August 2011

This Manual Supports Device Revisions:	
R CT 5031 Firmware Revision	451
Control System GUI Release	5.0.2

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Contents

Warranty

LYNX Technik AG warrants that the product will be free from defects in materials and workmanship for a period of three (3) years from the date of shipment. If this product proves defective during the warranty period, LYNX Technik AG at its option will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, customer must notify LYNX Technik of the defect before expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by LYNX Technik, with shipping charges prepaid. LYNX Technik shall pay for the return of the product to the customer if the shipment is within the country which the LYNX Technik service center is located. Customer shall be responsible for payment of all shipping charges, duties, taxes and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure, or damage caused by improper use or improper or inadequate maintenance and care. LYNX Technik shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than LYNX Technik representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non LYNX Technik supplies; or d) to service a product which has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty servicing the product.

THIS WARRANTY IS GIVEN BY LYNX TECHNIK WITH RESPECT TO THIS PRODUCT IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. LYNX TECHNIK AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. LYNX TECHNIK`S RESPONISIBILITY TO REPAIR AND REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. LYNX TECHNIK AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTIAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER LYNX TECHNIK OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

Regulatory Information

Europe

Declaration of Conformity

We LYNX Technik AG
Brunnenweg 3
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Germany

Declare under our sole responsibility that the product

TYPE: R CT 5031

To which this declaration relates is in conformity with the following standards (environments E1-E3):

EN 55103-1 /1996
EN 55103-2 /1996
EN 60950 /2001

Following the provisions of 89/336/EEC and 73/23/EEC directives.

Winfried Deckelmann

Weiterstadt, May 2009

Place and date of issue *Legal Signature*

USA

FCC 47 Part 15

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense

Getting Started

The controller card is installed into the rack frames and system tested in the factory. If this is an upgrade part or service exchange item then the module is supplied in a padded cardboard carton which includes the controller card.

Packaging

The shipping carton and packaging materials provide protection for the module during transit. Please retain the shipping cartons in case subsequent shipping of the product becomes necessary. Do not remove the module from its protective static bag unless observing adequate ESD precautions. Please see below.

ESD Warning

This product is static sensitive. Please use caution and use preventative measures to prevent static discharge or damage could result to module.

Preventing ESD Damage

Electrostatic discharge (ESD) damage occurs when electronic assemblies or the components are improperly handled and can result in complete or intermittent failure.

Do not handle the module unless using an ESD-preventative wrist strap and ensure that it makes good skin contact. Connect the strap to any solid grounding source such as any exposed metal on the rack chassis or any other unpainted metal surface.

Caution
Periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 MegOhms.

Product Description

The R CT 5031 is the Master Controller option for the R FR 3010/3011 and R FR 5010/5011/5012/5014 Rack Frame assemblies and provides central remote control, status monitoring and error reporting for all installed LYNX modules.

The module has an onboard PC running LINUX and is a complete stand-alone control solution. An external PC is connected over LAN which runs the supplied LYNX control software. This provides the graphical user interface to the control system. Controller configuration and administration is performed using a standard browser interface (IE, Mozilla Firefox etc).

The option consists of the controller hardware and the required LYNX control software that is designed to operate on a standard Windows compatible PC.

The R CT 5031 is one component in a scalable and modular control system topology that can expand from a single rack to hundreds of racks located in different locations. Controller options available are:

R CT 5021 – Rack Controller. This is normally the first controller added to a system and will provide remote control, status monitoring and error reporting for all modules installed in a single rack. This controller provides a serial connection (RS232/422) or LAN connection to the computer.

R CT 5010 - Bus Expander (Series 5000 systems only). This is designed for use with a host R CT 5021 or R CT 5031 controller and facilitates the expansion of the system into 7 more adjacent racks. A very cost effective expansion option for systems where all racks are in very close proximity.

R CT 5031 - Master Controller. For larger systems, or for systems requiring addition SW options, e.g. SNMP support we provide the Master Controller. This provides network connectivity, a browser style interface for controller configuration.

NOTE
Each control system is configured based on the application, connectivity requirements and the physical location of the racks. Care should be taken when specifying the controller options for larger systems. We can provide assistance in system design if you have some concerns. Please Contact your local dealer or a LYNX office for assistance.

Firmware Options

With the addition of the following firmware options the performance and features of the module can be greatly enhanced and tailored to meet a specific application.

> ***Note.*** *Firmware options can be added at any time by simply purchasing and installing a license code string. No hardware or firmware modifications are needed.*

For information on how to install a licensed option please refer to the GUI section of this manual.

Additional Functionality (OC_RSL_FUNC)

This option includes the following functionality, which are shown separately in the LYNX GUI: R CT 5031 Option Tab:

Backup / Restore

The addition of this option will enable a Backup – Restore functionality on the PC to backup and restore complete systems behind the controller.

R CP Simulation

The addition of this option will enable the control of the R CT 5031 with the simulation of the R CP 5000 HW panel

User Access Control

The addition of this option will enable functionality to manage and configure the access rights of different users to any parameter of any module in the system

Remote Control (OC_RSL_CTRL)

This option enables the controller to send alarms (traps) to a SNMP management system. The specific alarms of every module can be selected in the related events tab in the GUI of the respective module.

In addition the LYNX Remote Control API is activated to allow third party systems to control LYNX modules. The LYNX Remote Control API a simple ASCII based remote control interface (UDP or TCP/IP).

NOTE: In the options tab of the R CT 5031 these functionalities are shown separately

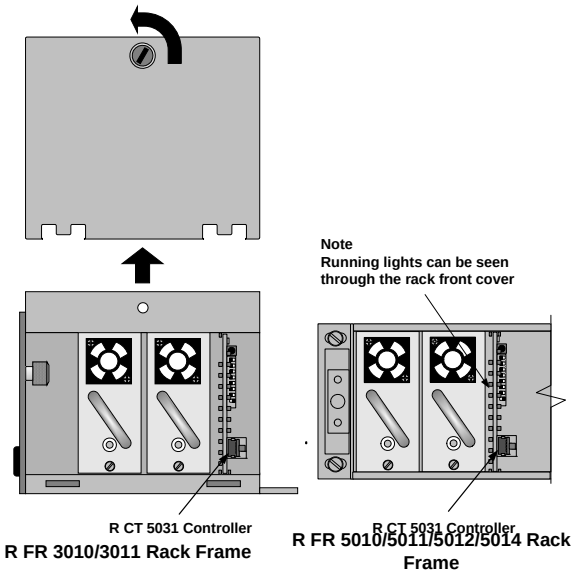
Installation

If this module was supplied as part of a system it is already installed in the rack enclosure. If the module was supplied as a field upgrade please follow the installation procedure below.

NOTE *Observe static precautions when handling card. Please see ESD warnings on Page 5.*

1. Slide the card module into the card frame. The card should fit easily and should not require excessive force to insert - if you feel any resistance, there could be something wrong with the rear connection panel location. **Do not** try and force the connection this may damage the connectors.

2. The R FR 5010/5011/5012/5014 Rack Frame and the R FR 3010/3011 Rack Frames both have a slot configured for the R CT 5031 Controller and the card is simply plugged in where shown.



3. Power up the rack and check the module LED's. Check the module is automatically logged into the control system device tree.
(It may take a minute for the controller to boot and for the control system to "discover" the new module)

Note: This only applies if the R CT 5031 is already connected to the GUI application

Controller Removal

The R CT 5031 Controller supports hot swapping. There is no need to remove power from the rack to exchange the controller (We recommend you observe standard precautions as described above to prevent static discharge onto the PCB while handling the unit as this may result in damage)

Removal and insertion of the controller will have no effect on the normal operation of the installed Modules, these will operate as previously configured before controller removal, and will resume this mode of operation when a new (and different) controller is installed in its place. All configuration settings are stored in the individual module flash ram storage.

While the rack will operate normally, naturally control of the rack will not be possible when the controller is removed. If R CT 5010 Bus Expanders are connected to the controller then these will also no longer be accessible to the control system.

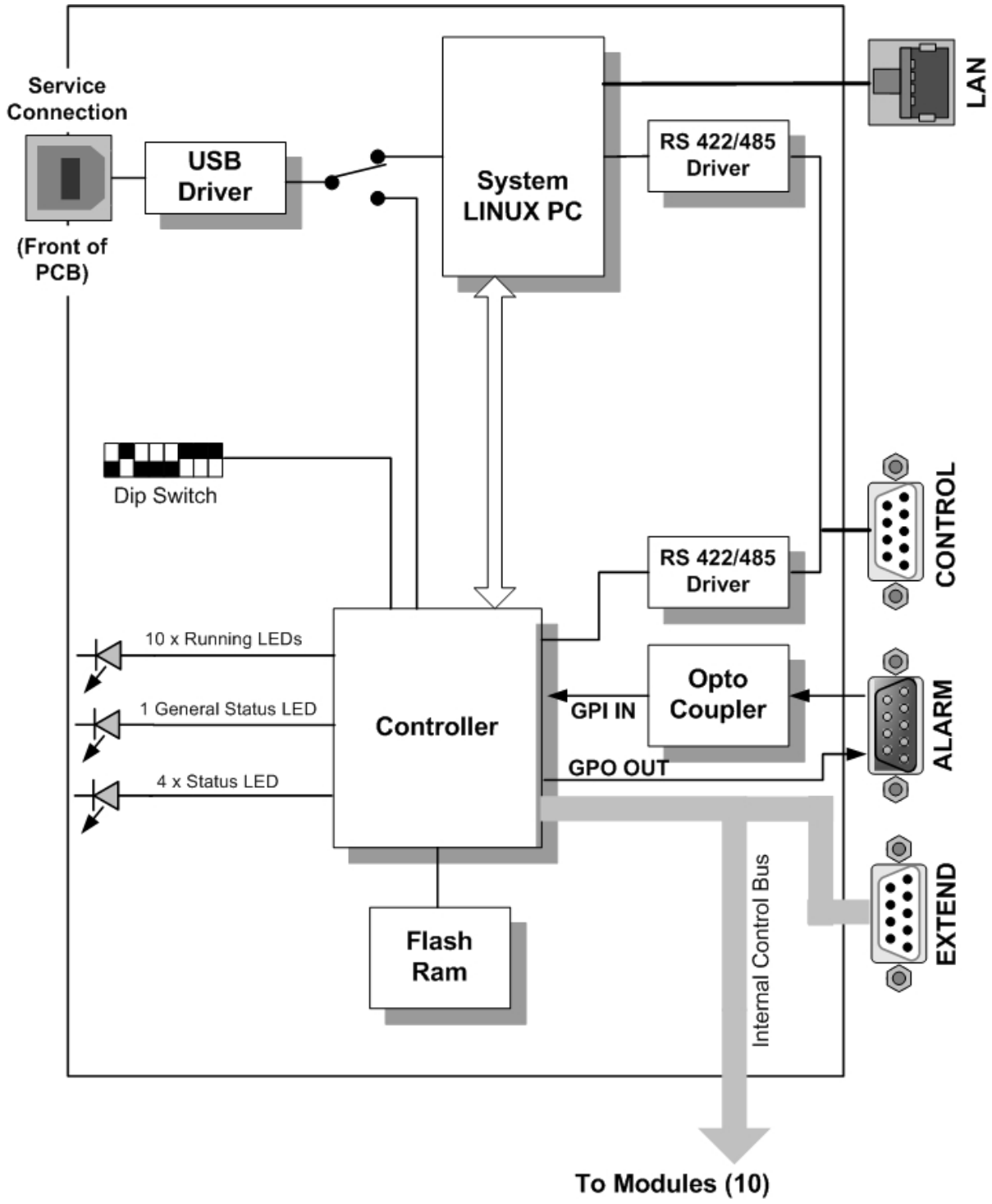
If the system is configured with multiple R CT 5021 controllers in multiple stacks then only the stack with the RCT 5021 controller removed will not be accessible from the control system, all remaining stacks will appear as normal on the control system.

NOTE: *If hot swapping an R CT 5031 with a new unit we suggest you duplicate all the switch settings on the new unit before installation to ensure a problem free exchange.*

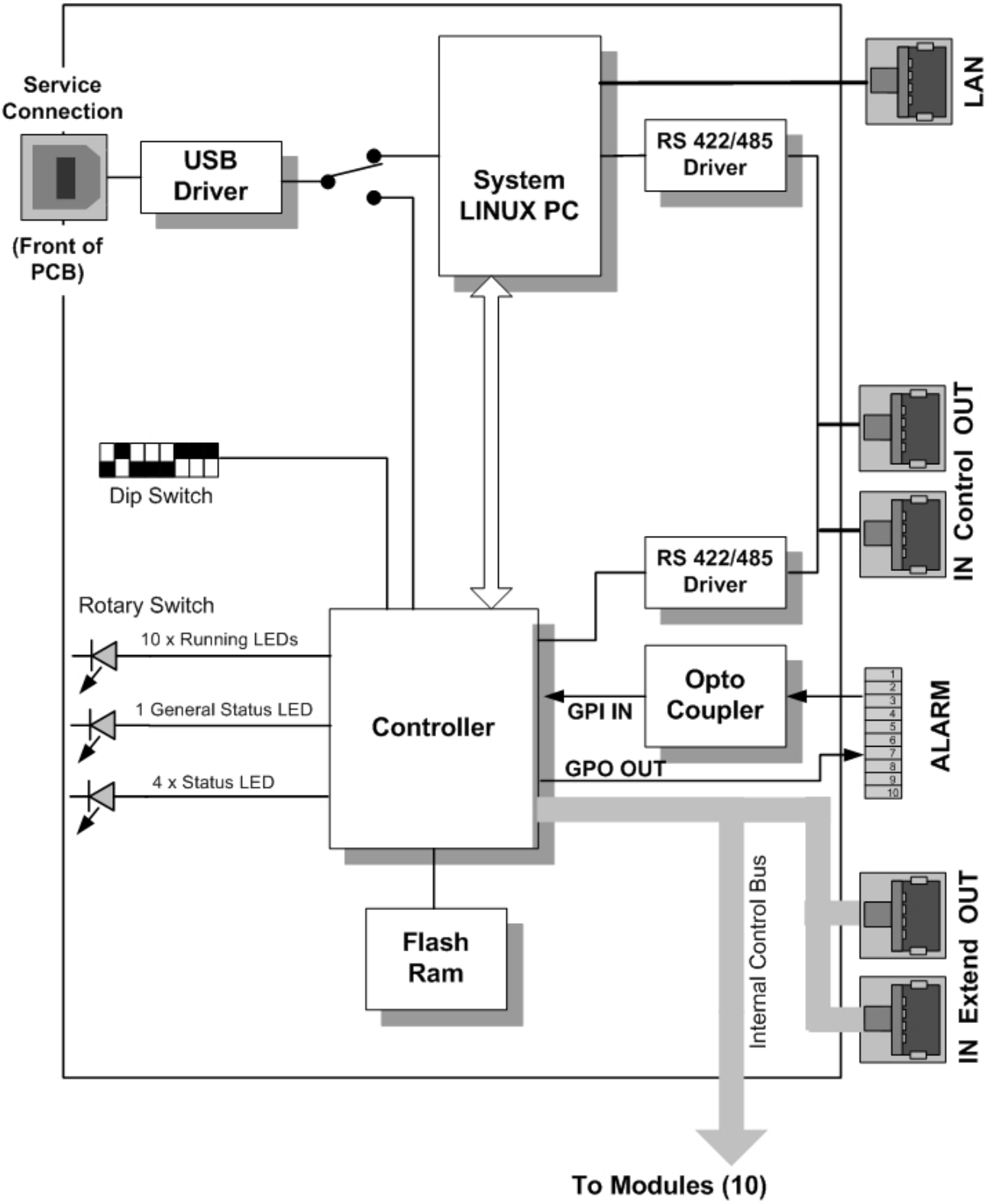
When inserting the new R CT 5031 it will automatically initialize and start running. This can be seen when the running lights start to cycle. The control software will detect the presence of the new controller and all modules attached will be accessible from the control system.

Functional Diagram

Below is the basic functional diagram for the R CT 5031 CardModule
(if used in R FR 3010/3011 and R FR 5010/5011)

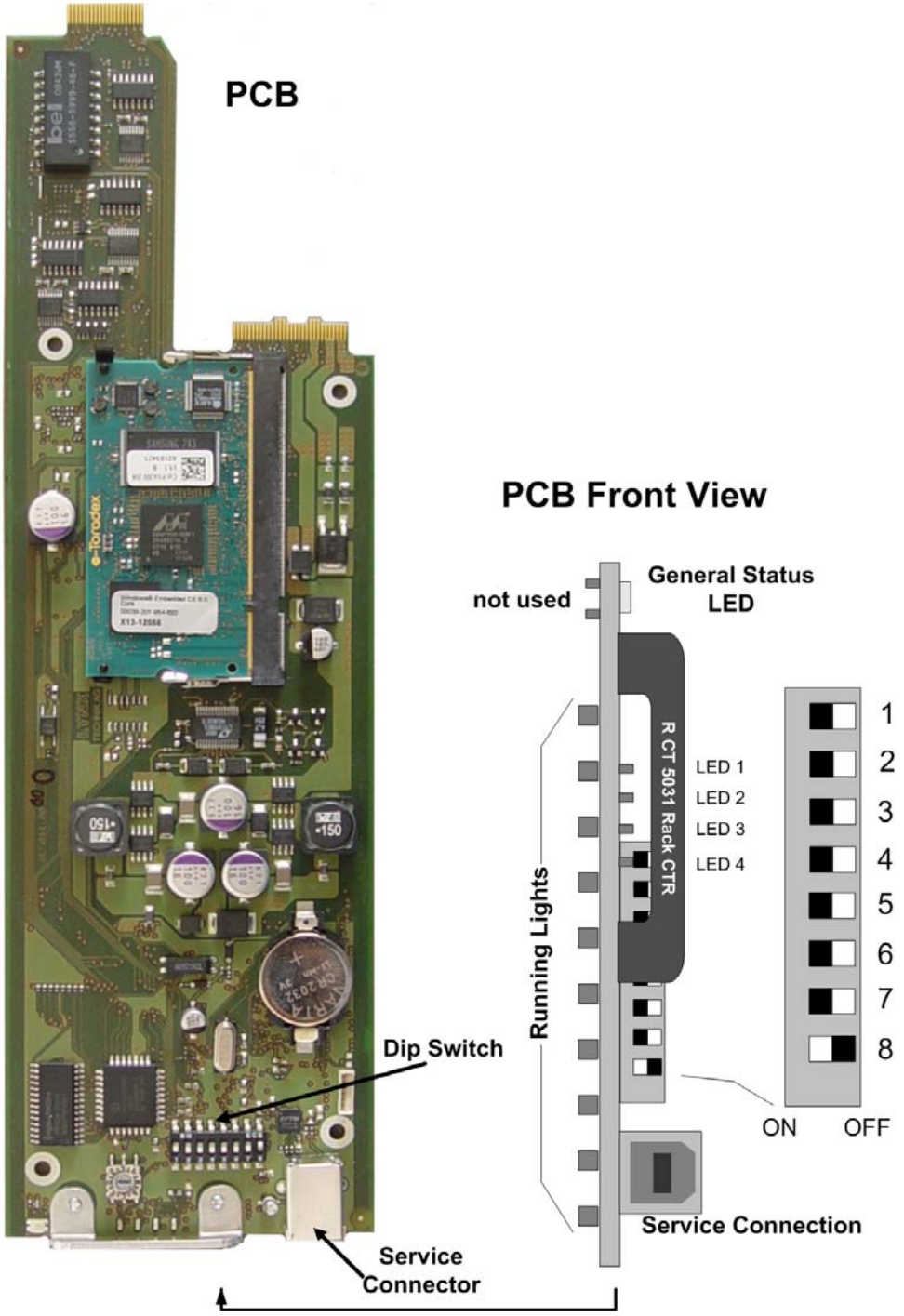


Below is the basic functional diagram for the R CT 5031 CardModule
(if used in R FR 5012/5014)



Module Layout

Below the physical layout of the R CT 5031 CardModule and the locations of the various controls / connections and indicators is shown:



Connections

Service Connection

The R CT 5031 Controller has a standard USB on the front of the PCB. This is designed for local connection of a PC running the LYNX control system software for testing / engineering purposes.

This connection can be used while the main control software is running on the TCP/IP connection.

NOTE: *When you install the LYNX Desktop Controller (GUI) the necessary Windows drivers for this USB connection will be automatically installed. This requires version 4.5.2. or higher of the LYNX Desktop Controller.The connection will be shown as a new, additional COM Port.The port number itself is variable.*

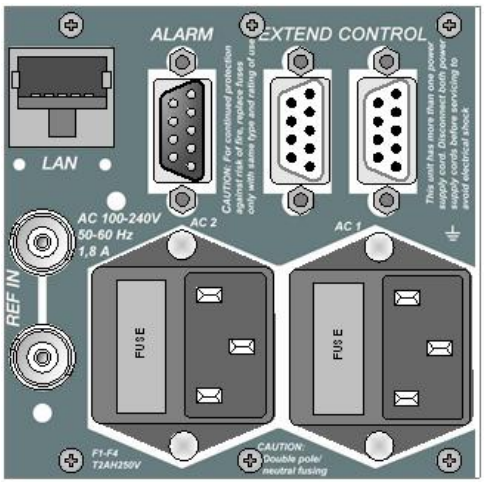
This connection can also be used as a low level terminal interface for engineering purposes, please refer to the switch settings section. A predefined configuration for the standard MS-Windows terminal program "Hyperterminal" can be found in the same directory as the LYNX control SW application is installed
(default: C:\Programme\Lynx\c3_local or C:\Program Files\Lynx\c3_local)

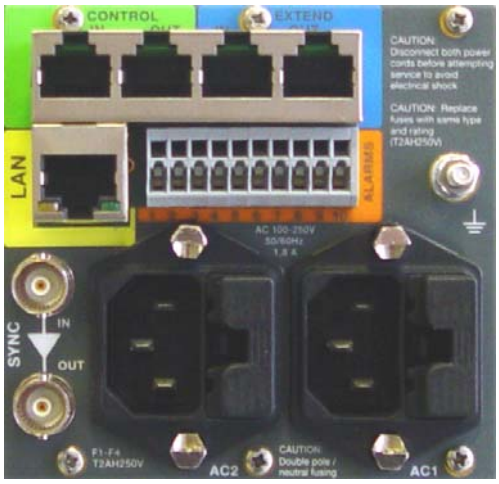
The following commands are available via this terminal connection:

```
getIP           Read current IP address
setIP address   [netmask [broadcast [gateway]]]
                Set a static IP address (and disable DHCP)
dhcp            Enable dynamic IP configuration using DHCP
resetIP         Reset the IP address to the factory default
resetPW         Reset the admin password to the factory default
remoteIF        Enter remote-control interface mode
version         Display version of LYNX Device Controller
help            Show this information
exit|quit       exit the administration console
```

System Connections

All external connections to the controller are made through the integral termination panel in the rear of the Rack Frames. See below.





R FR 3010/3011 and R FR 5010/5011 R FR 5012/5014

Termination Panels

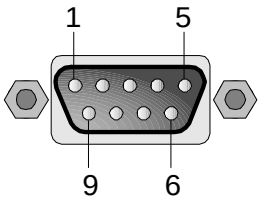
The R CT 5031 primarily makes use of the "**LAN**" (RJ45) connection. Through this TCP/IP interface the controller can be connected to a LAN.

Depending on the system configuration and the number of racks the "Extend" and "Control" connections can be used in different ways. For more information see below.

Alarm Connection **(R FR 3010/3011 and R FR 5010/5011 rack frames)**

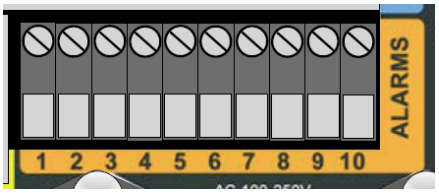
An external alarm connection is available from the rack. In the **R FR 3010/3011 and R FR 5010/5011** rack frames it is a 9 pin SubD male connector. Function and connection information is described below.

Pin Number	Connection	Pin Number	Connection
1	GND Shield	6	N/C
2	Alarm Major	7	GPI in A
3	Alarm Minor	8	GPI in B
4	Alarm Common	9	GND Shield
5	GND		



Alarm Connection **(R FR 5012/5014 rack frames)**

An external alarm connection is available from the rack.



1	2	3	4	5	6	7	8	9	10
GPI B	GPI A	Alarm 4B	Alarm 4A	Alarm 3B	Alarm 3A	Alarm Minor B	Alarm Minor A	Alarm Major B	Alarm Major A

Function and connection information is described below.

Alarm Function

This function requires the controller option. The user can assign triggers for the preferred Major / Minor and No Alarm conditions using the controller and supplied software (see below in the GUI section).
The alarm connector provides GPO contacts for 2 alarm levels and two more Alarms and a GPI input for future use. This allows for the connection of an external monitoring system. Alarm conditions are triggered by the optional control system and will vary depending on the configuration of the system and user preferences.

For critical failures in the rack a contact can be closed between **Alarm Minor A** and **Alarm Minor B.**

Two examples of “critical” type failures are listed below*:

- Over temperature
- Redundant Power Supply Failure

For major failures in the rack a contact can be closed between **Alarm Major A** and **Alarm Major B**. One example of a “major” failure in the rack is:

- Loss of Power

Note: *See below in the paragraph “Software Operations” how to set Alarms with the R CT 5031*

Extend Connection **(R FR 3010/3011 and R FR 5010/5011 rack frames)**

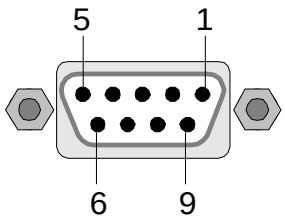
Bus Extension. This connection is used to interface racks together when using the LYNX control system. This is a simple (and inexpensive) way to extend the reach of the host R CT 5031 controller into several more racks fitted with R CT 5010 bus expanders. It uses a **proprietary** LYNX control interface and this connection is physically daisy chained between all connected racks. Connection details can be seen in the table below.

The connection is a 9 pin SubD female connector. Function and connection information is described below.

Connector wiring detail when used for the Bus Extension

Pin Number	Connection	Pin Number	Connection
1	Prop CLK A	6	Prop CLK B
2	Prop TX A	7	Prop TX B
3	Prop RX B	8	Prop RX A
4	GND	9	Prop SEL 2
5	Prop SEL 1		

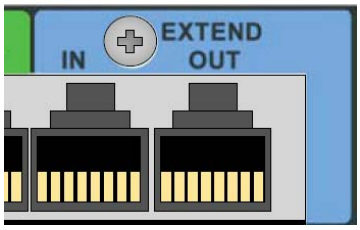
Note the “prop” term refers to proprietary for the LYNX interface.



Note. *When using this interface all connected racks must be mounted close together, (preferably with no space in-between racks), as the distance of this interface is restricted. Please refer to the R CT 5010 Rack Bus Expander reference manual for more details on this interface and the cables required.*

Extend Connection **(R FR 5012/5014 rack frames)**

Bus Extension. This connection is used to interface racks together when using the optional LYNX control system. This is a simple (and inexpensive) way to extend the reach of the host RCT 5021 or R CT 5031 controller into several more racks fitted with RCT 5010 bus expanders. It uses a **proprietary** LYNX control interface and this connection has an input port as well as an output port for simple control configuration of all connected racks.
The connection is a standard RJ45 female connector.



Pin 8 … 1

Standard networks cables (we recommend the use of shielded cables) can be used to connect the racks. On each rack frame an input and an output port for the extend bus is provided.

Pin Number	Connection	Pin Number	Connection
1	SPI CLK A (Prop CLK A)	6	SPI MISO B (Prop RX B)
2	SPI CLK B (Prop CLK B)	7	SPIX SEL1 (Prop SEL 1)
3	SPI MISO A (Prop RX A)	8	SPOIX SEL2 (Prop SEL 2)
4	SPI MOSI A (Prop TX A)		
5	SPI MOSI B (Prop TX B)		

Note. *When using this interface all connected racks must be mounted relatively close together, as the distance of this interface is restricted to approx. 10m for the total chain over all connected rack frames. Please refer to the R CT 5010 Rack Bus Expander reference manual for more details on this interface.*

Control Connection **(R FR 3010/3011 and R FR 5010/5011 rack frames)**

Below is the pin out information for the rear CONTROL port when used in RS 485 mode to connect to R CT 5021 controllers in a system.

Typically, a serial cable with straight through connections will be sufficient for this application.

Rear Termination Panel CONTROL Port

Connections for RS 485

Pin Number	Connection	Pin Number	Connection
1	GND Shield	6	GND
2	TX A	7	TX B
3	RX B	8	RX A
4	GND	9	GND Shield
5	GND		

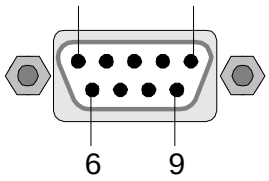


Figure 8. Control Connector

Control Connection **(R FR 5012/5014 rack frames)**

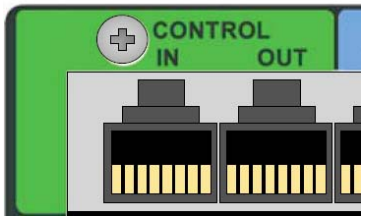
An external Control Interface is provided on the rear termination panel. When an RCT 5021 Rack Controller (or RCT 5031 Master Controller) is fitted to the rack this port can be used for two primary functions:

1. When configured as a RS 232 serial port this can be connected directly to a PC running the LYNX Desktop Controller application.

2. When configured for RS 422/485 operation this port is used to connect a rack frame with an RCT 5031 master controller connected to other racks fitted with RCT 5021 Rack controllers (up to 15 additional racks) using the IN and OUT connections provided.

Note. *Please refer to the R CT 5021 Reference Manual for details on how to re-configure the port and more detail on the use of this control interface.*

The connection is a standard RJ45 female connector.



Pin 8 … 1

Standard networks cables (we recommend the use of shielded cables) can be used to connect the racks. On each rack frame an input and an output port for the control bus is provided.

Connections for RS 422

Pin Number	Connection	Pin Number	Connection
1	GND	6	SER RX B
2	GND	7	n.c.
3	SER RX A	8	n.c.
4	SER TX A		
5	SER TX B		

Connections for RS 232

Pin Number	Connection	Pin Number	Connection
1	GND	6	RX
2	GND	7	n.c.
3	n.c.	8	n.c.
4	TX		
5	n.c.		

Control System Topology

Before using the R CT 5031 it is worthwhile to understand the control system topology and expansion path to ensure the correct use of the controller.

There are three hardware building blocks to a LYNX control system. The first step is to add the R CT 5021 Controller to your system. This will provide remote control / status monitoring and error reporting for all the installed modules in the R FR 5010/5011/5012/5014 Series 5000 rack frame or the R FR 3010/3011 Series 3000 rack frame.

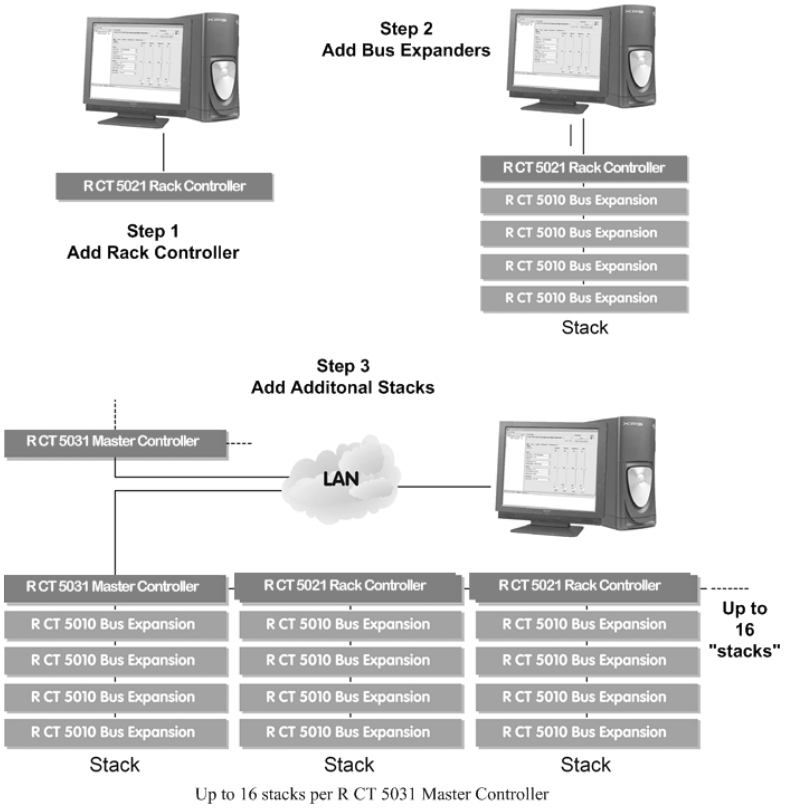
Expansion will involve adding R CT 5010 Bus Expanders and R CT 5031 Master controllers where necessary. No two systems are alike and there are some physical limitations that need to be considered when configuring a system. This is mainly in the area of interconnections that relates directly to the physical location and proximity of the racks.

When moving beyond a single rack there is two choices. Add an R CT 5010 Bus Expander to the second rack or add an R CT 5031 Master Controller.

If the two racks are in close proximity (mounted on top of each other in the same rack) then the R CT 5010 is the most economical and practical solution for expansion. Up to seven additional racks can be daisy-chained onto a single R CT 5021 or R CT 5031. Total cable length for this connection is limited to approx. 1.5m in R FR 3010/3011/5010/5011 and approx 10m in the R FR 5012/5014 rack frames.

If the distance between the racks is greater, then the R CT 5031 Master Controller needs to be added to the system in the next step. This will allow RS 485 connectivity (direct cabling or through LAN connection of R CT 5021) between the racks. A single Master controller can support up to 15 x R CT 5021 Rack controllers. Total cable length for serial connection of all connections is 250m.

We arrange the system into “control stacks”, which forms a logical expansion path. See below:



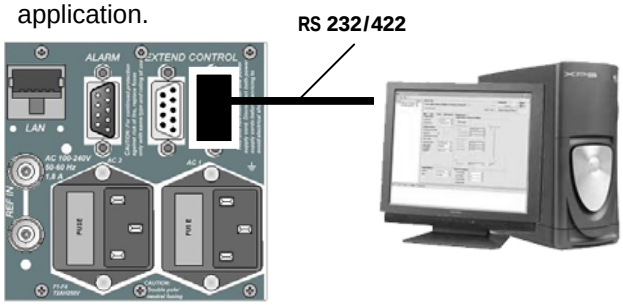
Up to 16 stacks per R CT 5031 Master Controller

Configuration Examples

Below we have shown the connections that are used for the various stages of system expansion. This is provided to show examples on how to use and configure the controller's external connectivity. Examples show connections of the R FR 3010/3011/5010/5011 rack frames.

Single Controller System

This is the first stage in adding control to a system and simply involves connecting the **CONTROL** port to the serial port of the PC running the LYNX Control system software application.

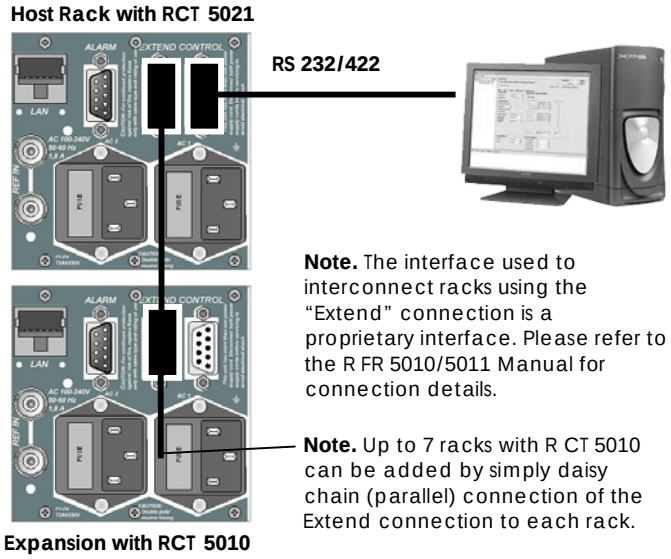


Note. *The connection is a RS 232 connection that is limited in length (3m max). If greater distances are required between the host rack and PC, then the controller port should be configured to RS 422* and a RS 422 to RS 232 converter placed near the PC (not supplied)*

* Please refer to the switch settings section of this manual for details on configuring the serial port.

R CT 5021 used with R CT 5010

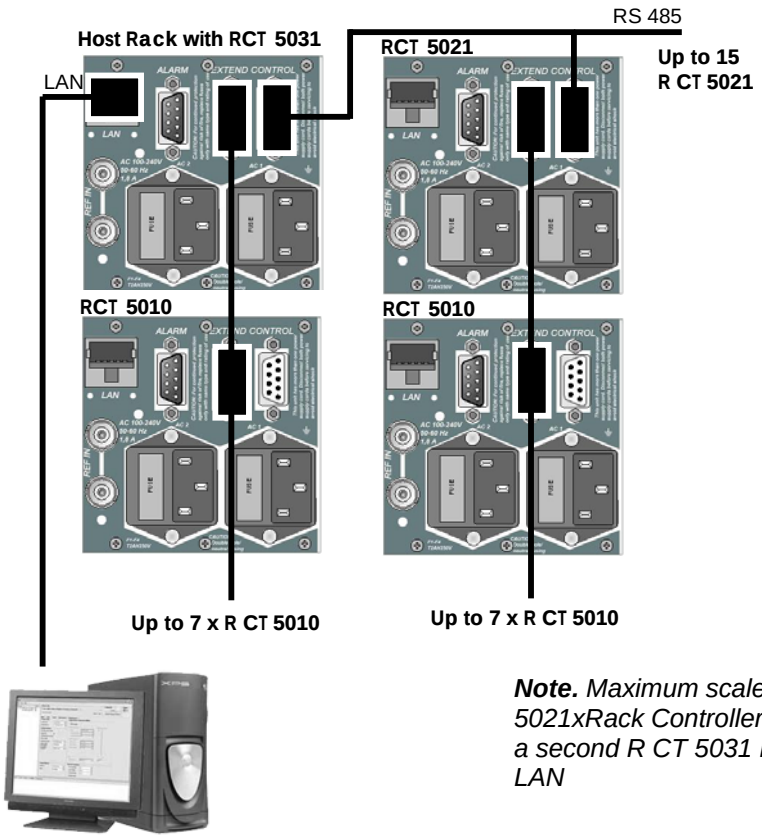
The next step in expanding the control system beyond a single rack is to add the R CT 5010 Bus Expander to the second rack. This is the most economical solution.



When using the R CT 5010 is it necessary to have the racks in close proximity [preferably stacked on top of each other in the same 19" rack] as the max length of the cable to interconnect the racks is limited (1.5m; 10m in R FR 5012/5014 rack frames). If larger distances are required between racks then the use of a R CT 5031 Master controller and multiple R CT 5021 Rack controllers is recommended.

R CT 5021 used with R CT 5031

To expand the system beyond the eight racks possible in one “stack” using R CT 5010 Bus Expanders it is necessary to add a R CT 5031 Master Controller to the system.

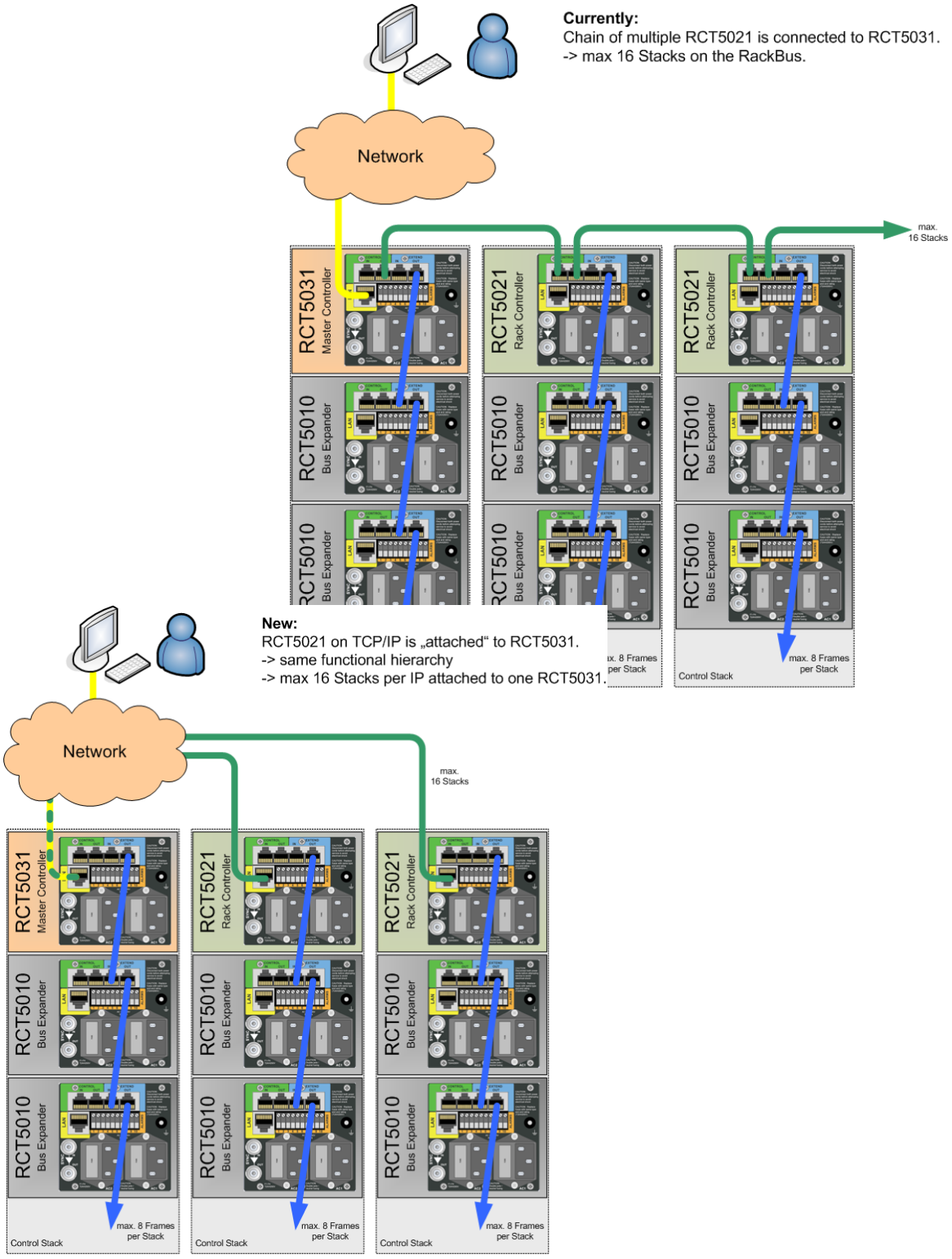


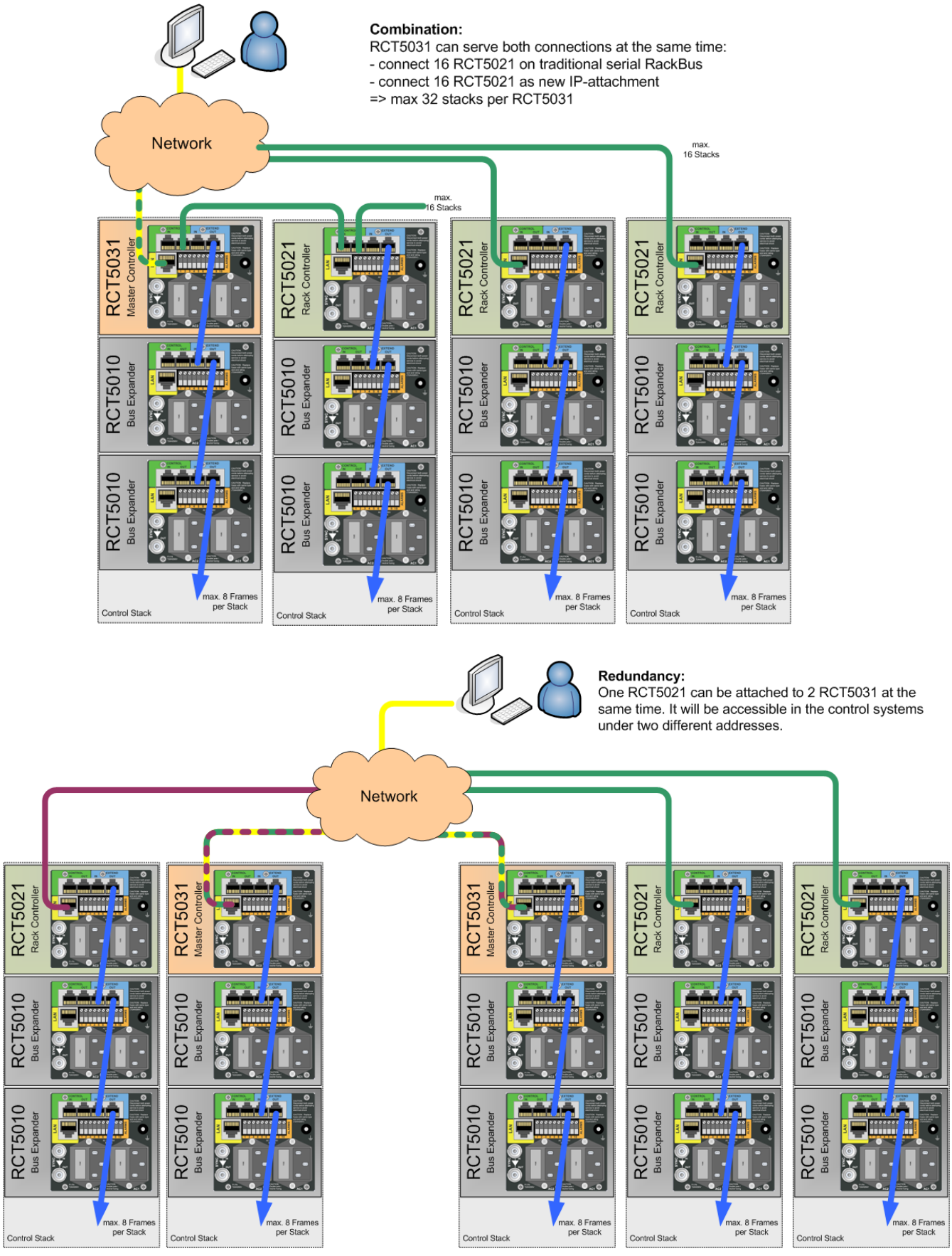
Note. *Maximum scale for a single R CT 5031 is 15 x R CT 5021xRack Controllers. Further expansion is achieved by adding a second R CT 5031 Master controller with connecting into the LAN*

Note *Please refer to the R FR 3010/3011 or R FR 5010/5011/5012/5014 rack frame manuals for cable wiring information.*

Configurations via Network

Examples show R FR 5012/5014 rack frames




Combination:
RCT5031 can serve both connections at the same time:
- connect 16 RCT5021 on traditional serial RackBus
- connect 16 RCT5021 as new IP-attachment
=> max 32 stacks per RCT5031
Network
max.
16 Stacks
max.
16 Stacks
RCT5031
Master Controller
RCT5021
Rack Controller
RCT5010
Bus Expander
max. 8 Frames
per Stack
Control Stack
Redundancy:
One RCT5021 can be attached to 2 RCT5031 at the
same time. It will be accessible in the control systems
under two different addresses.
Network

Settings and Control

The R CT 5031 has integral switches that are used for configuration of the controller.

Dip Switch Settings

Below the switch settings for the 8-position dip-switch are defined.
Switch function is described in more detail after the table.

Switch	Setting	Function
1	ON	For Future Use
	OFF	For Future Use
2	ON	For Future Use
	OFF	For Future Use
3	ON	For Future Use
	OFF	For Future Use
4	ON	For Future Use
	OFF	For Future Use
5	ON	For Future Use
	OFF	For Future Use
6	ON	For Future Use
	OFF	For Future Use
7	ON	For Future Use
	OFF	For Future Use
8	ON	Service connector: Terminal Connection to System Linux PC
	OFF	Service connector: Control interface

Switch Function Detail

Switch 1– 7: Reserved for future use

Switch 8: This switch selects the function of the front side USB service connection. Selecting ON will enable direct connection to the System Linux PC using the simple terminal interface. Selecting OFF will make this connection active for use with a PC running LYNX control software and will enable control of the stack connected to the R CT 5031 using this port.

Factory Preset Condition

The R CT 5031 is delivered with stored presets for the following functionality.

Switch 8 : **OFF** CONTROL Port = Device Control Mode
(unused switches are set to OFF)

No further adjustments are needed if this is the functionality desired.

Alarm/LED Status Indicators

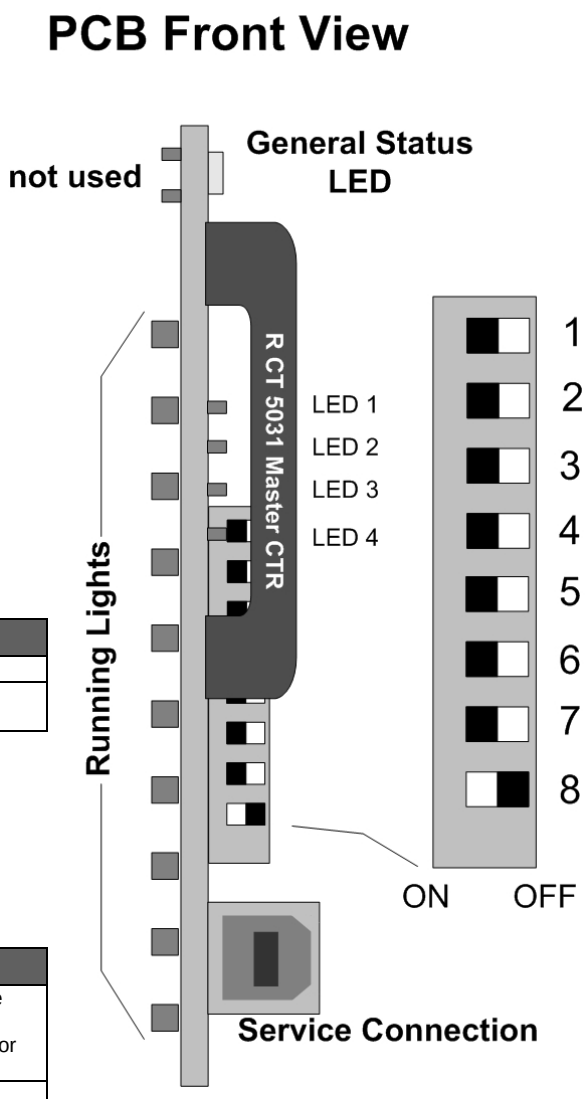
The R CT 5031 module has LED indicators that serve as alarm and status indication for the module. Function is described below.

The Indicators are found on the front edge of the module PCB. The running lights are visible through the rack cover.

Running Lights

There are 10 “running lights” stacked on the left hand side of the PCB. These will [cycle up/ all switch off / cycle up] while the controller is operating normally. In the unlikely event the controller stops working / develops a fault then these will either freeze, go slow or go out. The running lights are visible through the Series 5000 Rack cover.

The “running lights” can be switched off via the LYNX C3_local GUI SW.



General Status LED

There is single tri-color general status LED on the top of the module. This is used to indicate the general status of the rack and the installed modules.

LED Color	Indication
Green	Indicates normal operation
Red	No control connection to rack power supply

Controller Status LED`s

A stack of 4 LEDS (LED1…LED4) are used to indicate controller status. Function is described below.

LED Number	Indication
1	**ON** Hotsync active and no data to be written to any card **OFF**: Controller writes data to cards or Hotsync deactivated
2	Hotsync **SAVE**
3	Green if service connection is active on front USB connector
4	On – Board Server is running

Note: After power up it will take approx. 1 minute for the on-board server to boot. This is indicated with the 10 running LEDs running much slower. After the boot process LED 4 will light up.

LYNX Desktop Controller Software

The LYNX Desktop Controller software is supplied as part of the R CT 5031 controller package. This is supplied on CD Rom or can be downloaded from the LYNX homepage (http://download.lynx-technik.com/public/c3_local/).

The Control Software is a comprehensive centralized application which provides for the remote control / status monitoring and error reporting for all modules installed in a system.

System Requirements

The control software is designed to run on a Windows compatible PC. Minimum requirements specified below:

Operating System:
Microsoft Windows XP Home/Professional (min. XP Service Pack 2)

PC
IBM compatible PC, Pentium 4 class, 256MB ram VGA Monitor, CD Rom drive, approx. 90 MB of free space on HDD

Operating System:
Microsoft Windows Vista Home/Windows 7 Professional

PC
Minimum requirements
approx. 90 MB of free space on HDD

Software Installation

1. Close all other applications on the PC.

Insert the software CD into the CD-ROM drive. If the CD-ROM does not start automatically, start the application from the CD by clicking on: SetupLynxController.xxxxxxx.RELEASE_x.x.x.exe

2. The following screen will display, click **Next** to continue

3. Read the license agreement and click **I Agree** if acceptable.

4. Select the additional components and click **Next**

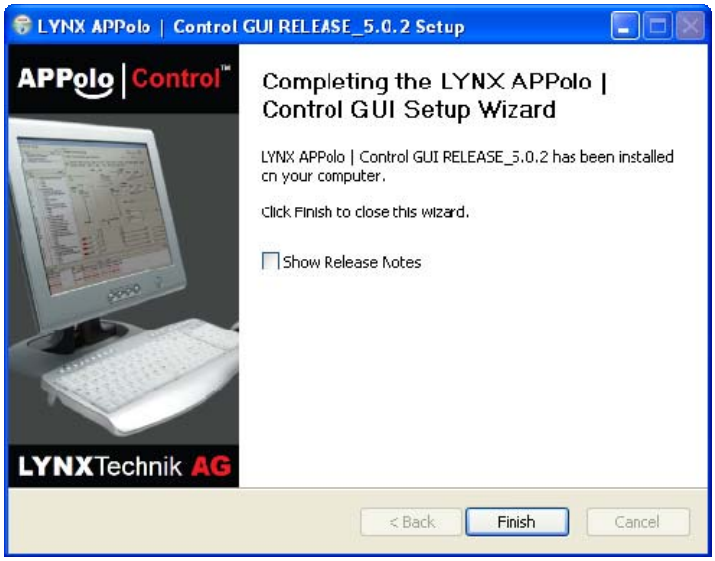
Note: Installation of the USB Drivers is mandatory for the USB front service connector

5. Define the destination folder and press **Next** to install the application. You can use the proposed standard folder, which will be created automatically.

6. You can select the start folder menu and if you can choose if you would like an icon placed on your desktop.

7. Installer will then start copying files to your hard drive. When finished **Close** the Installer.

8. When finished the following screen will display. Please acknowledge by clicking **Finish**. When selecting the checkbox **Show Release Notes** a text with associated information about the installed release will pop up.



Starting the Controller Application

Simply click the icon on the desktop to start the controller application.

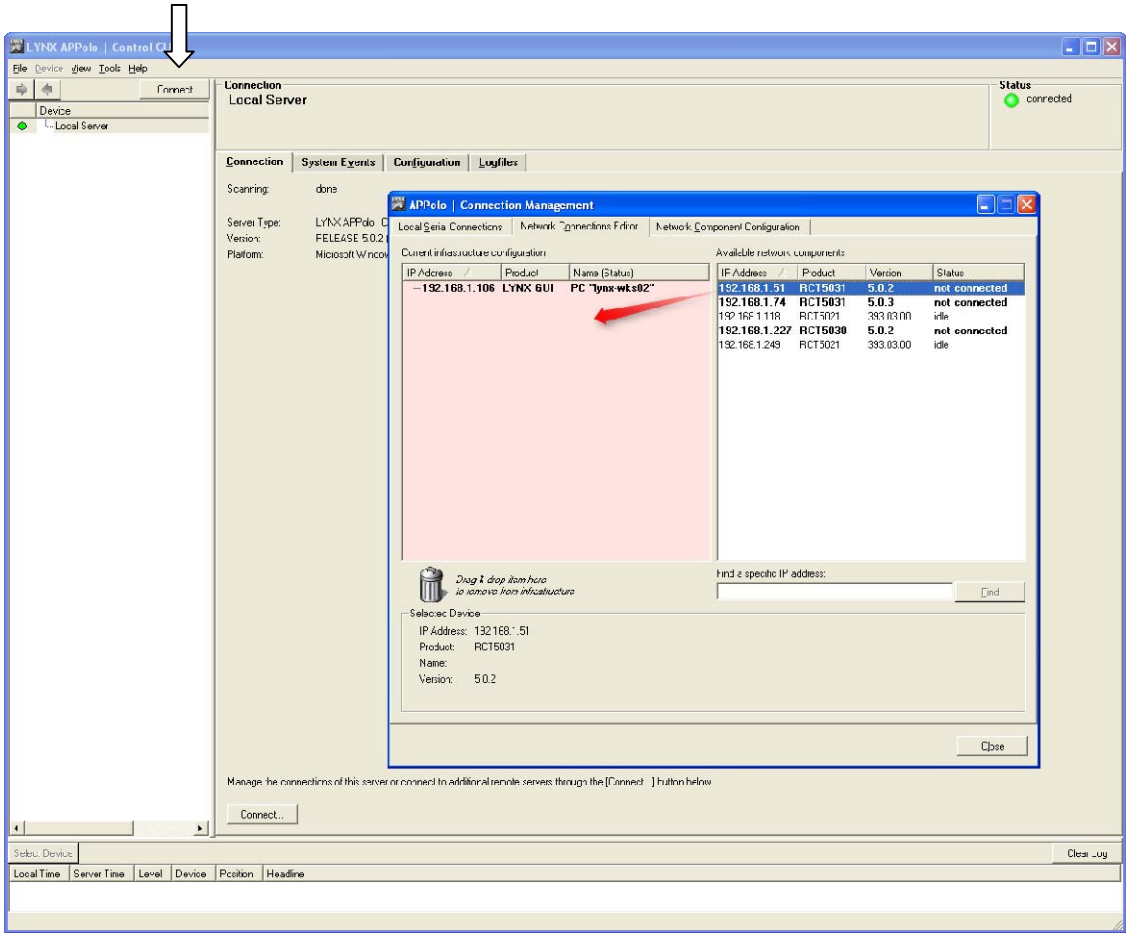
LYNX Controller Icon.

OR navigate to the lynx folder in “program files” and select **c3_local.exe**

The GUI will start and the application will firstly look for all attached controllers, when found a controller it will report all the attached modules into the GUI and these will displayed in the folder tree. Module detection is automatic.

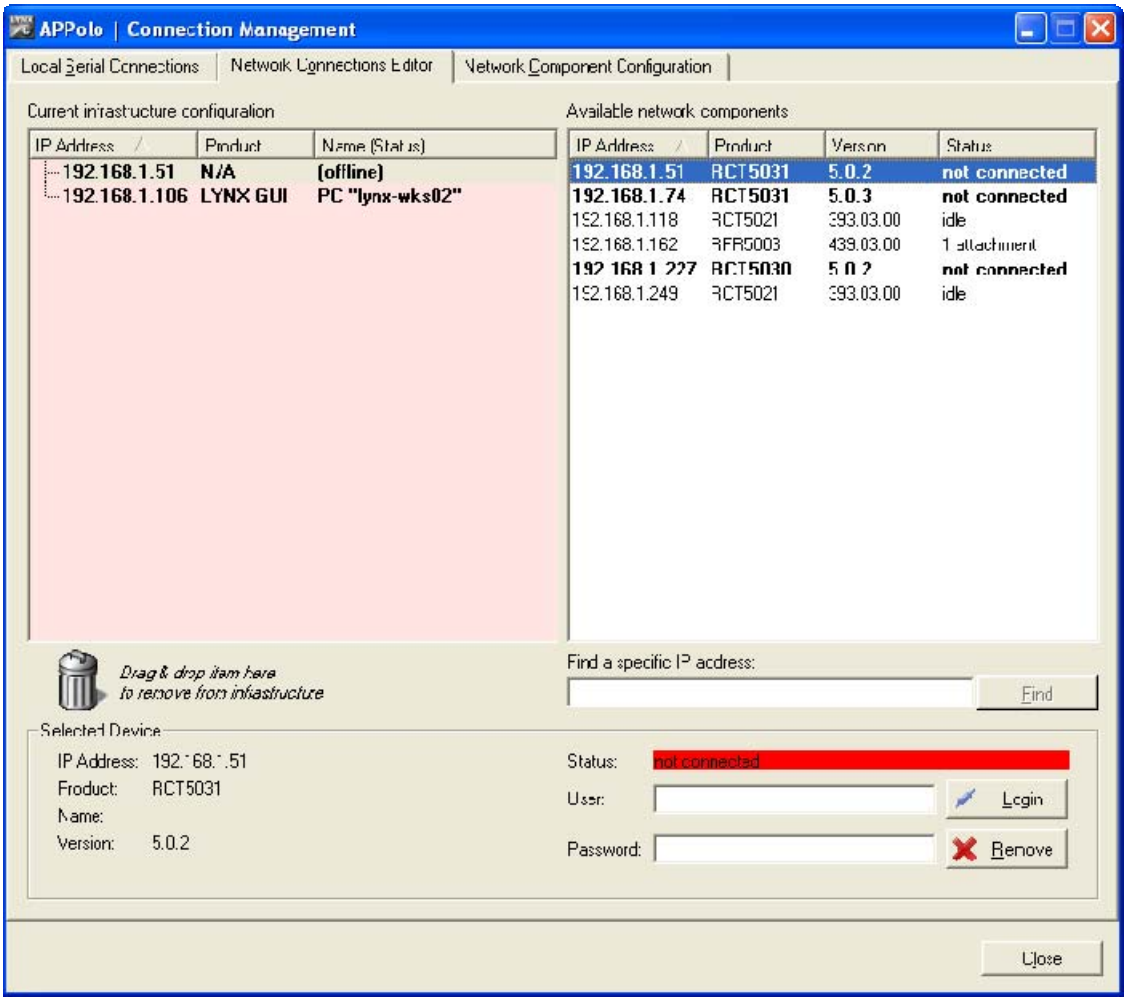
Connecting to the R CT 5031 (Network Connections Editor)

If you were not connected to the server already in a previous session then click on the CONNECT button.



A window listing all available or previously connected LYNX servers in a network will pop-up (select Tab Network Connections Editor).. Drag and drop the required R CT 5031 from the right area “Available Network Components” to the left area ““current infrastructure configuration”.

At the bottom of this window an entry field for user name and password will appear.

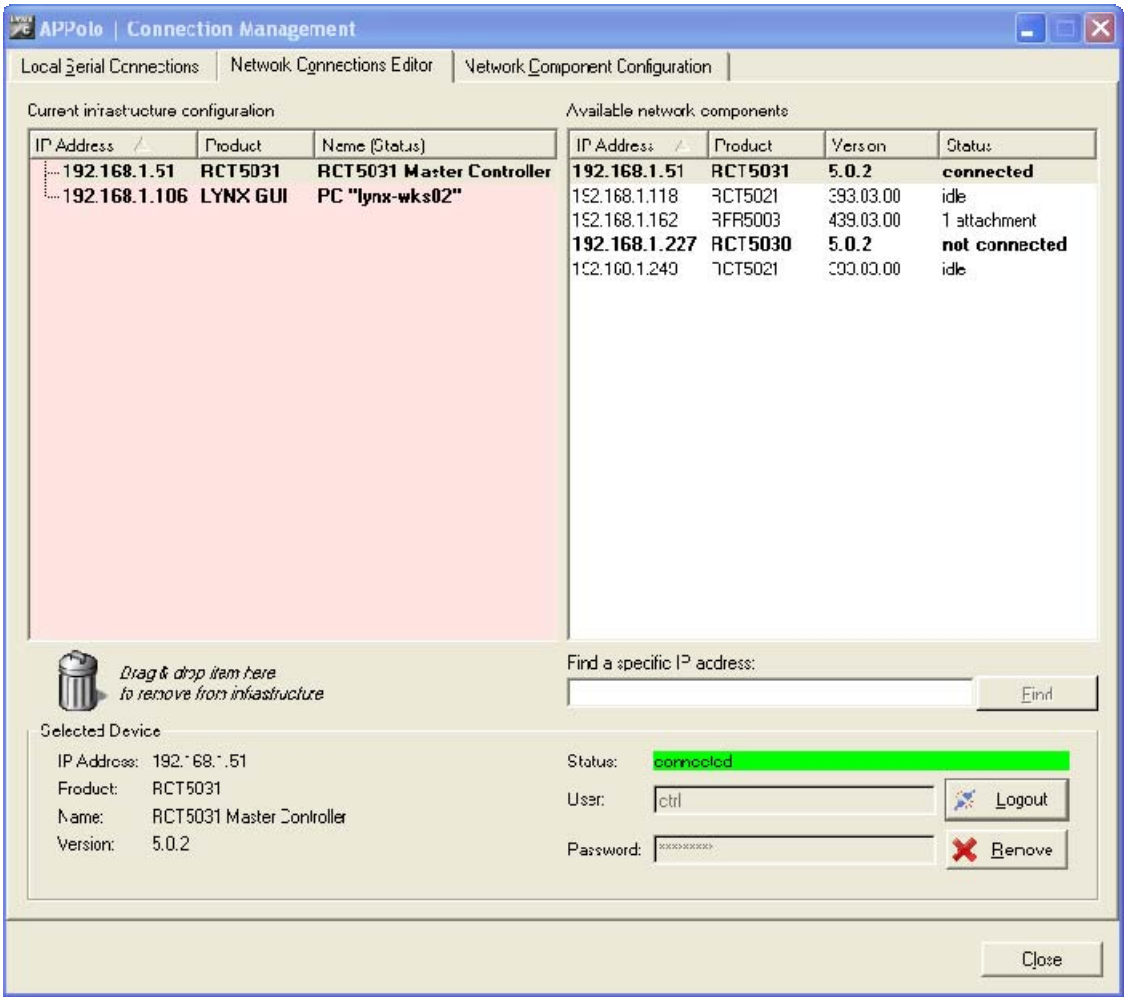


Please enter User Name and password:

Default user name: ctrl
Default password: lynx$ctrl
Default IP address: 192.168.1.160

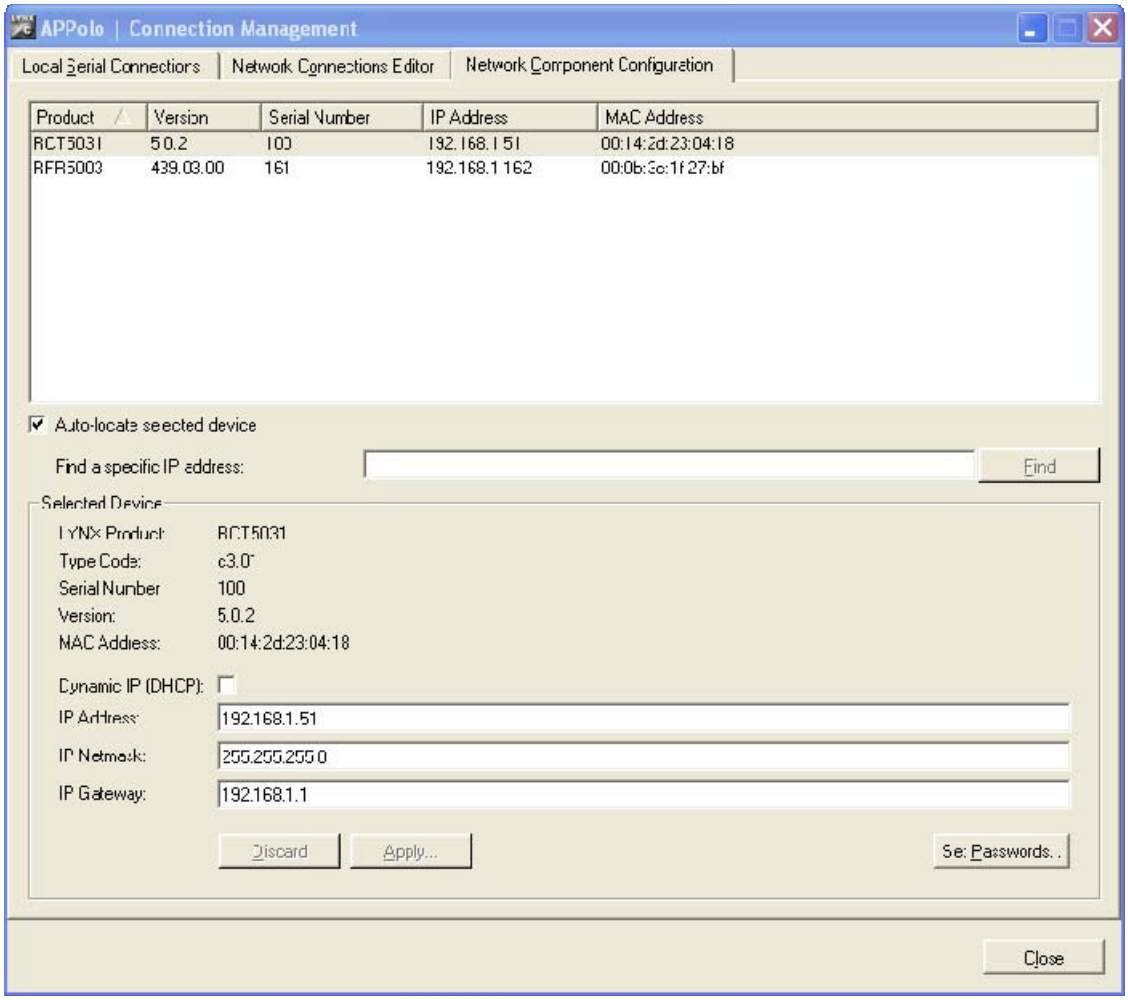
Note: The R T 5031 also supports DHCP mode, this can be activated via the Network Component Configuration (see below).

If the login was successful the GUI will connect to the R CT 5031. This is indicated in the Status field /turning to Green)



Configuration of the R CT 5031 (Network Component Configuration)

To configure the R CT 5031 please select tab “Network Component Configuration. The screen below will display.



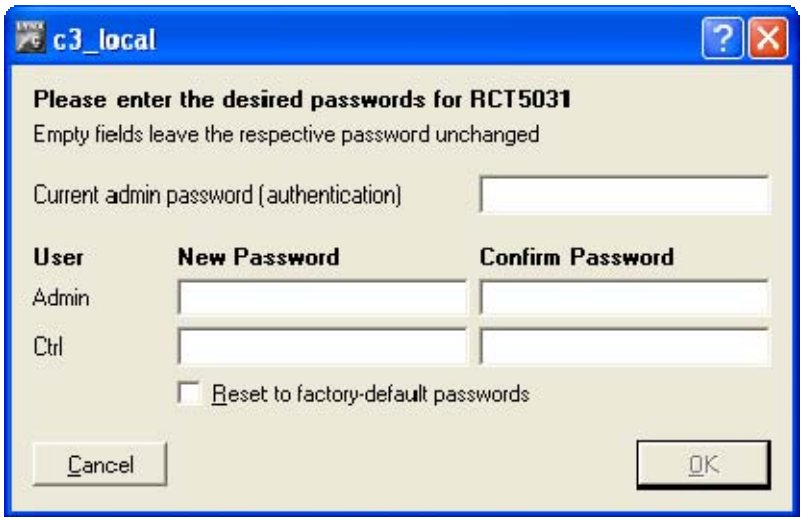
All relevant information about the selected controller will be shown.

With the check box Dynamic IP (DHCP) the controller can bes et for DHCP mode in the network.

IP Address. IP Netmask and IP Gateway address can be changed with the three entry fields.

Changing User Passwords

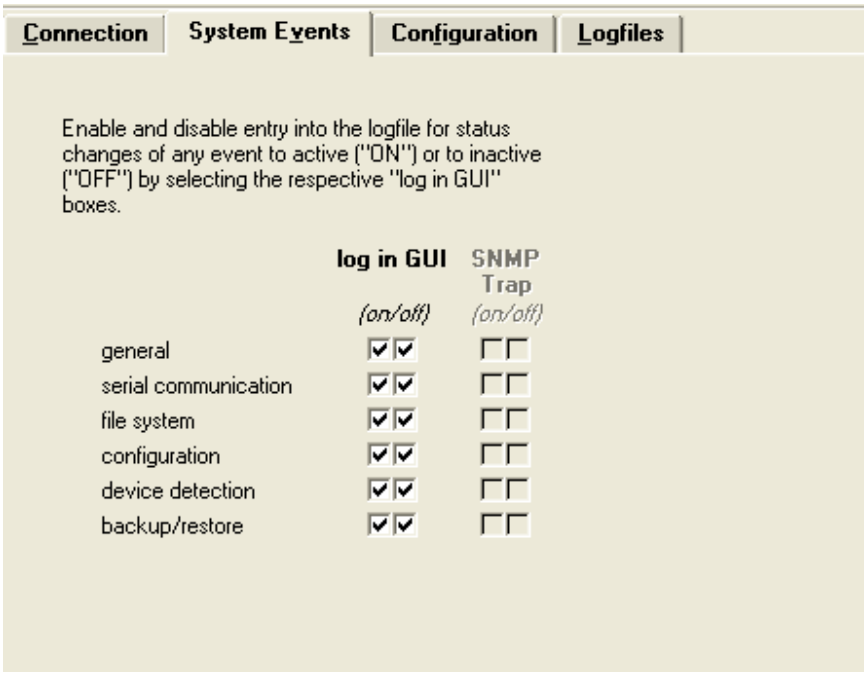
To change the user password) please click on the button “Set Passwords”. The following pop-up window will appear



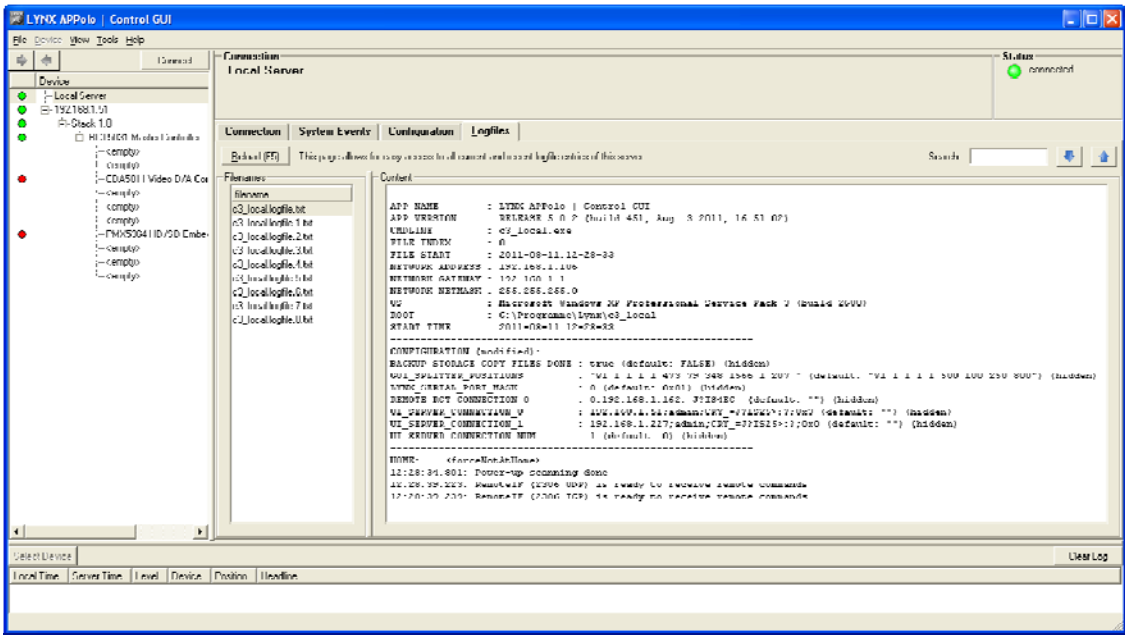
Changing the passwords requires authentication of the network administrator.

System Events

Through the tab “System Events” general, system related alarm messages can be enabled.



Event log files are stored on the R CT 5031 directly. Access to the log files is possible through the tab “Logfiles”



Controller Configuration via Web IF

The controller supports configuration using any standard Internet browser (IE, Mozilla Firefox etc). The controller has a factory preset IP address of:

192.168.1.160

Using this IP address in your browser will access the controller configuration.

Note: While this address will be suitable for most installations there may be instances where this IP address clashes with existing addresses or violates a network rule. The IP address can be changed. Please refer the section “system settings” for changing the default IP address.

Note: The R T 5031 also supports DHCP mode, this can be activated via the terminal connection (see below).

Login

When connected you will be presented with the main login screen.

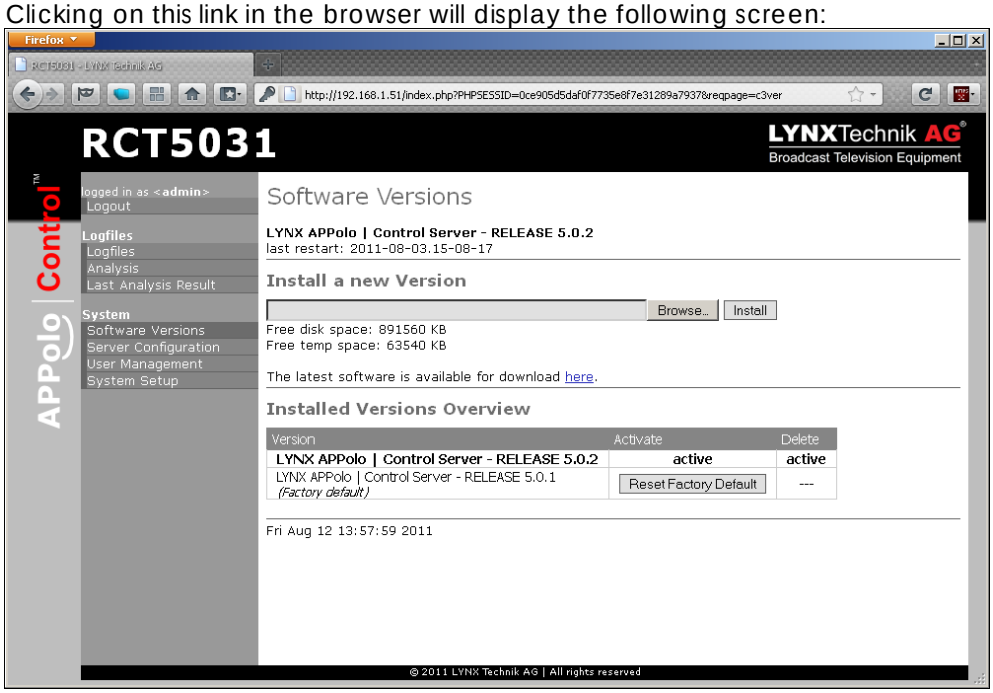
Default login name and password is below.

Login: **admin**
Password: **lynx$admin**

Note. Login name and passwords can be managed with “User Management” please refer to this section for more details

Software Versions

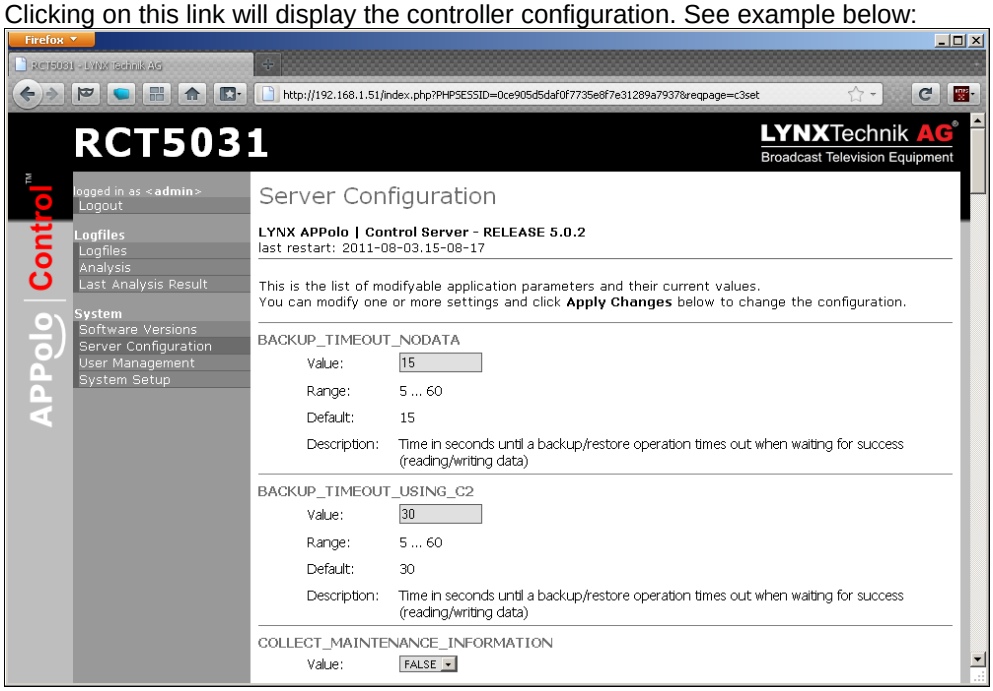
Clicking on this link in the browser will display the following screen:



There will be a list of the versions installed on the controller. New software versions can be uploaded and installed on the controller from your PC.

Server Configuration

Clicking on this link will display the controller configuration. See example below:

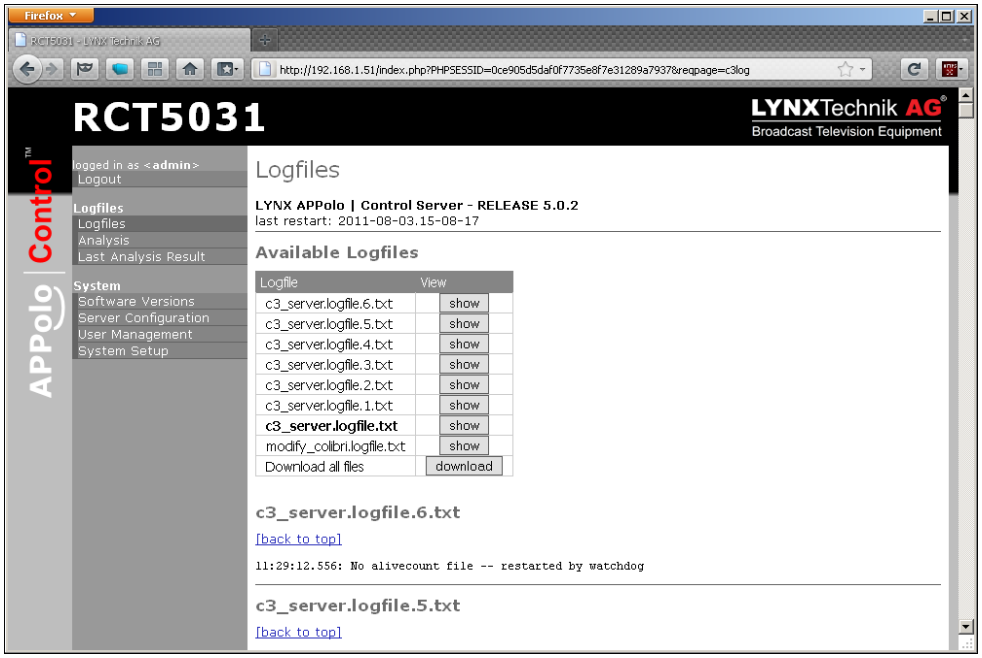


An explanation of each parameter is made on screen, and making necessary changes is simple. “Apply changes” will restart the local server application.

Logfiles

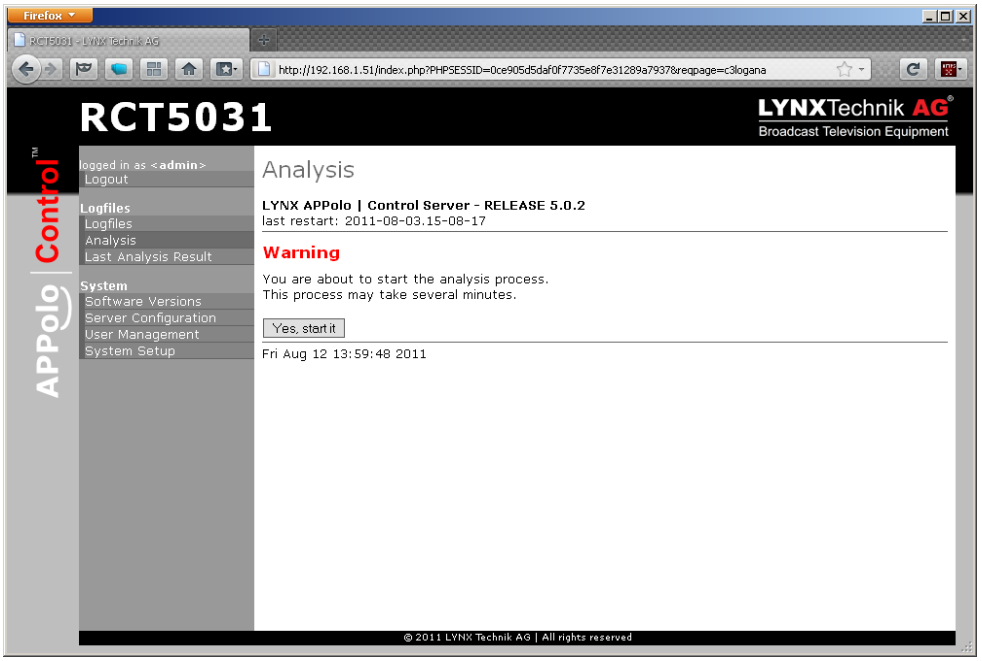
The system has powerful logging capabilities and clicking on the logfiles link will enable access to view the stored logfiles. See below:

With “Cut&Paste” the logfiles can be copied into other applications, e.g. into an e-mail attachement.



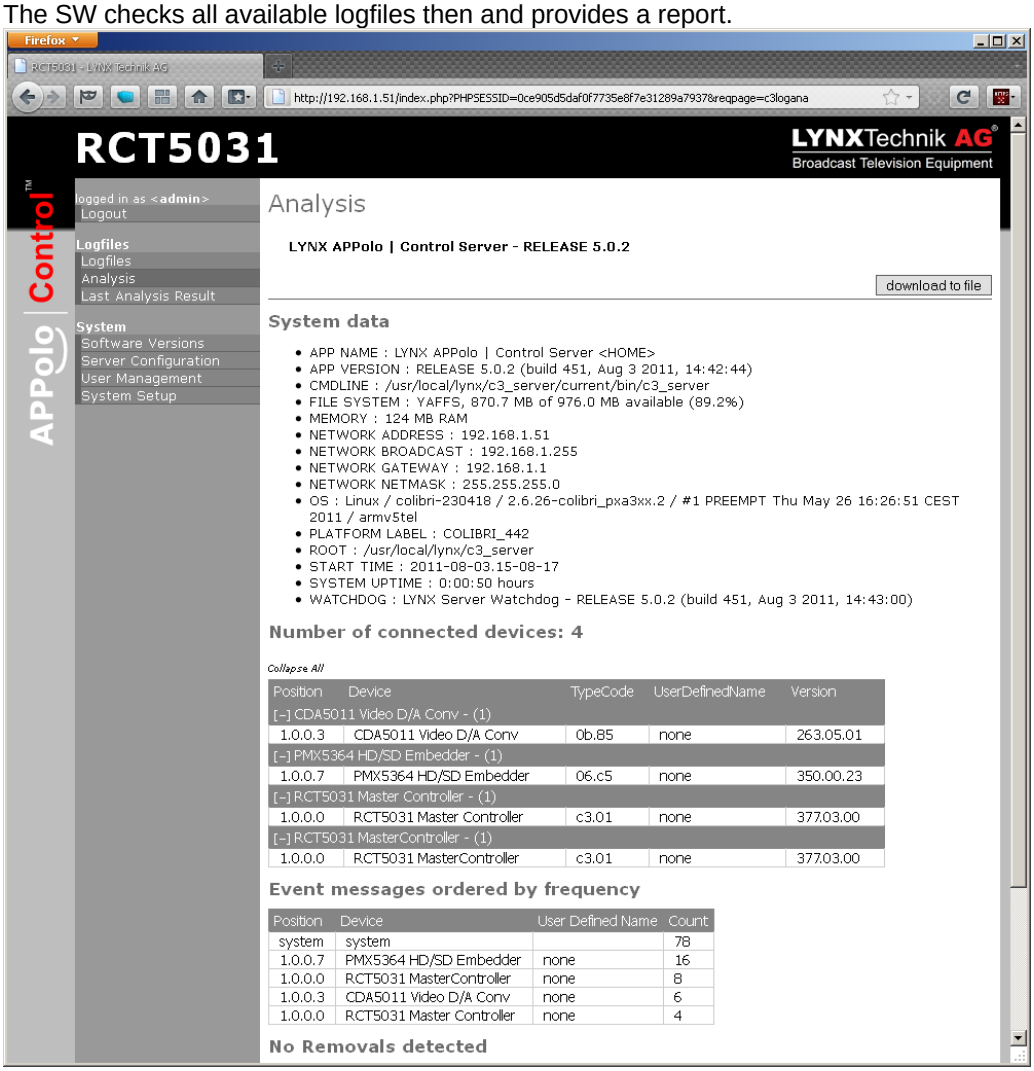
Logfile Analysis

Clicking on the Logfiles – Analysis link will activate a tool for analysis of the system environment.



The **Yes, start it** button will start the analysis process, which can take a few minutes

The SW checks all available logfiles then and provides a report.

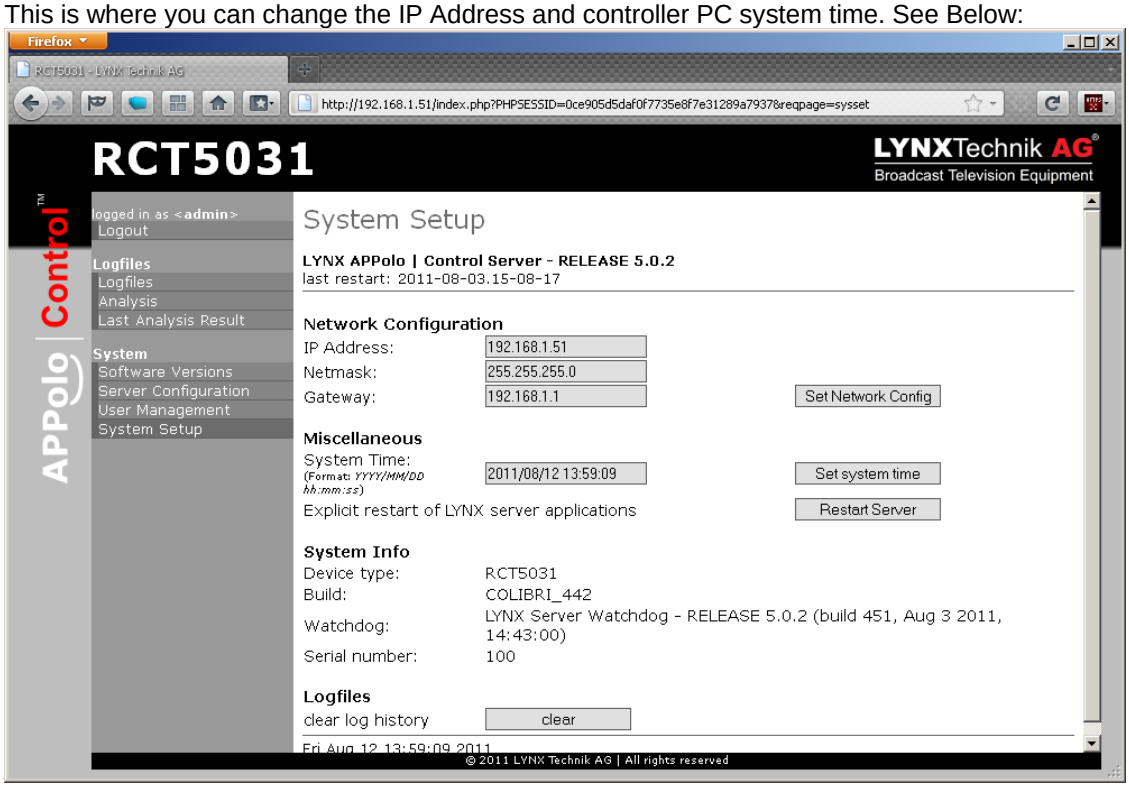


If the R CT 5031 was moved from one system to another you will get a mixture of both systems in the analysis report. To avoid that you can delete existing logfiles (see chapter system setup below).

If you closed the browser application and you would like to view the results again, just click on the **Last Analysis Result** link. This will open the last report again.

System Setup

This is where you can change the IP Address and controller PC system time. See Below:



Note.
If there is a conflict with the default IP address and your current network then you naturally cannot access this configuration screen to make IP changes. There are three possible ways to connect to the system to gain access to change the IP address:

1) Use the Network Component Editor in the LYNX Appolo Control GUI (see page 35). This is the easiest way to change IP addresses. The system will detect R CT 5031 controllers even with wrong IP address or if the controller is in the wrong domain.
2) Connect the LAN connection directly to the PC and bypass any hubs or in house networks this will give access and you can modify the IP address under “settings” as shown above.
3) Use the Terminal Interface. The RCT5031 has a terminal interface. This is a very low level USB interface for some simple configuration tasks. It works completely without the LAN connector.

Connect a cable from the PC USB port to the front side service connection.
Start a standard terminal program on your PC (anything will suffice) port configuration:

Speed:	38400
Bits:	8
Parity:	none
Stoppbits:	1
FlowControl:	Off
Local Echo:	Off

NOTE: As a convenience, the LYNX Desktop Controller SW installs a file named LynxSerial.ht (default location: C:\Program Files\Lynx\c3_local\LynxSerial.ht). This is a ready-to-use configuration file for the Microsoft HyperTerminal program. If the

HyperTerminal program is installed on your Windows-PC,double clicking this file will open up a correctly configured connection via the USB connection.

In the terminal window on the PC you should see a on screen prompt (hit the RETURN key once if you do not see it).

Here is a list of the available commands at this prompt:

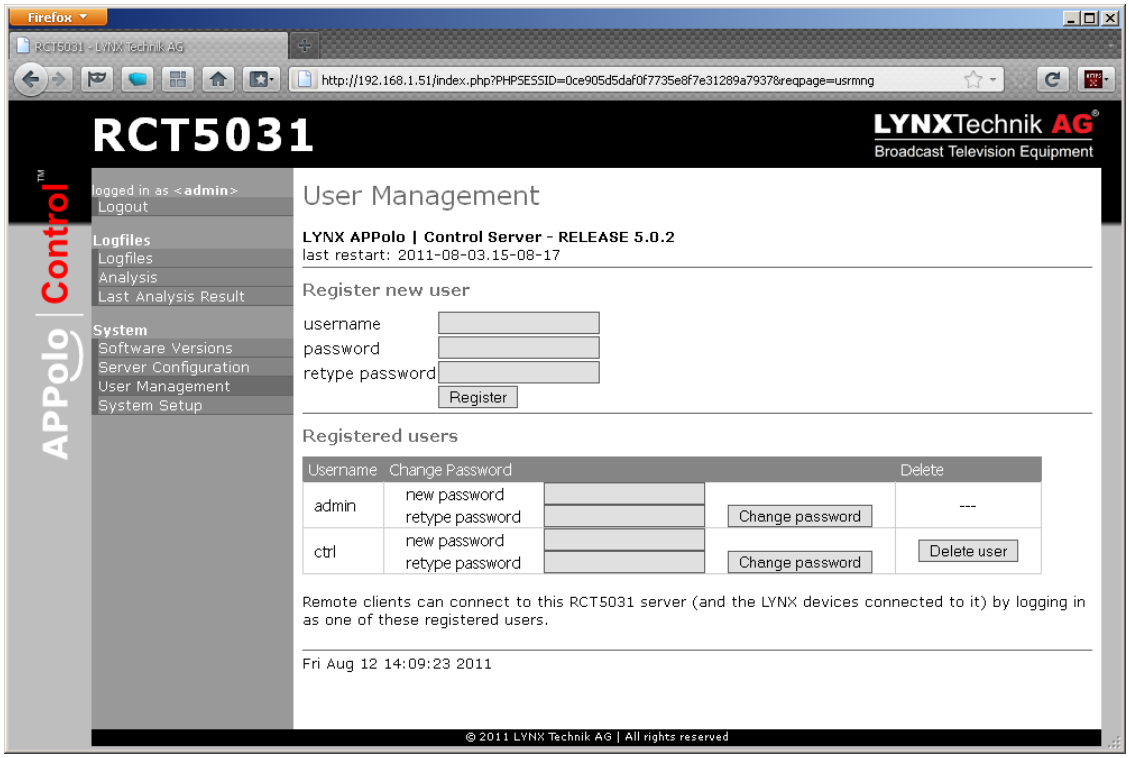
```
getIP           Read current IP address
setIP address   [netmask [broadcast [gateway]]]
                Set a static IP address (and disable DHCP)
dhcp            Enable dynamic IP configuration using DHCP
resetIP         Reset the IP address to the factory default
resetPW         Reset the admin password to the factory default
remoteIF        Enter remote-control interface mode
version         Display version of LYNX Device Controller
help            Show this information
exit|quit       exit the administration console
```

On that prompt, you simply type one of the listed commands and hit RETURN.

Note: If you type “dhcp” and hit RETURN, the R CT 5031 is set to DHCP mode. To switch off DHCP mode again simply set a specific IP address, e.g. type “setIP 192.168.1.160” and hit RETURN

User Management

This link enables the management of user names and passwords for the system. See below:



Two users are initially configured:

Admin – this user is the system administrator who has access to all functions and can reconfigure the controller using this interface.

Ctrl – this is a normal user who will use the PC graphical user interface to monitor and control the system.

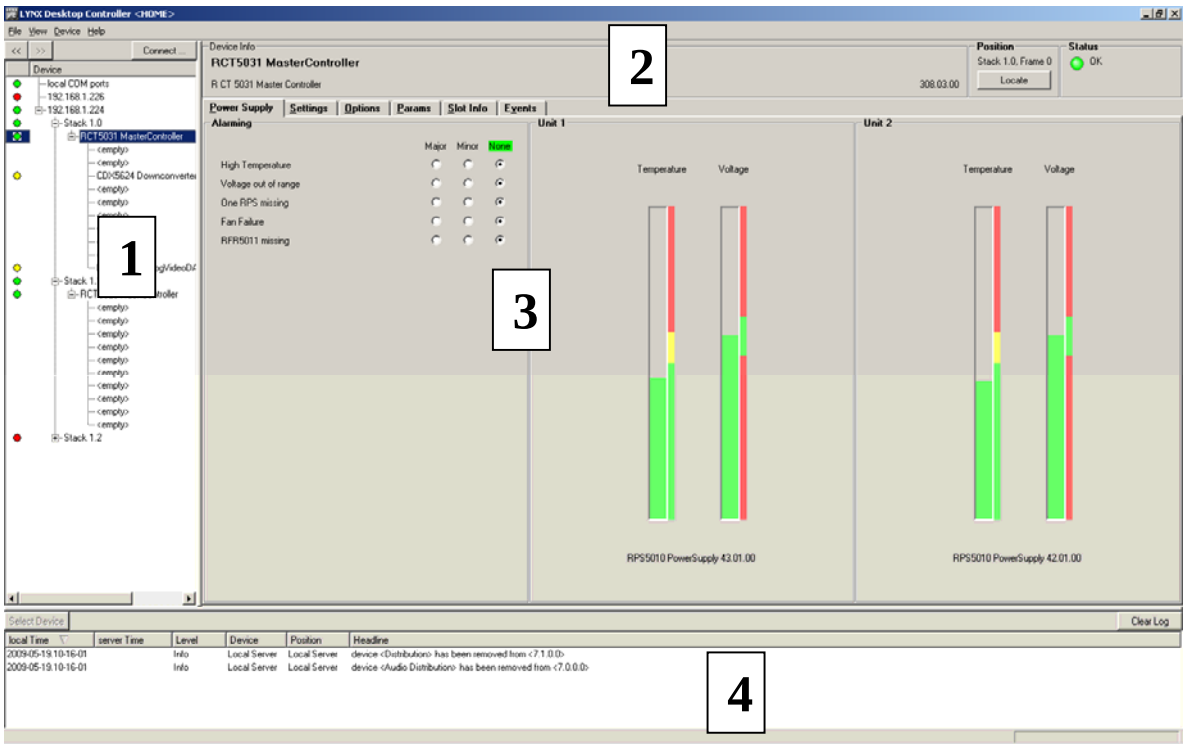
Note:

- Additional users can be generated
- Existing users can be removed (except user “admin”)
- All passwords can be changed

Software Operation

The LYNX Control Software is intuitive and simple to use, presented in a familiar Windows style layout. It is beyond the scope of this manual to provide detail on each individual control available for all supported modules, please see in the manuals of the individual modules. This is intended as an introduction to the general layout and the use of the control GUI focused on the R CT 5031.

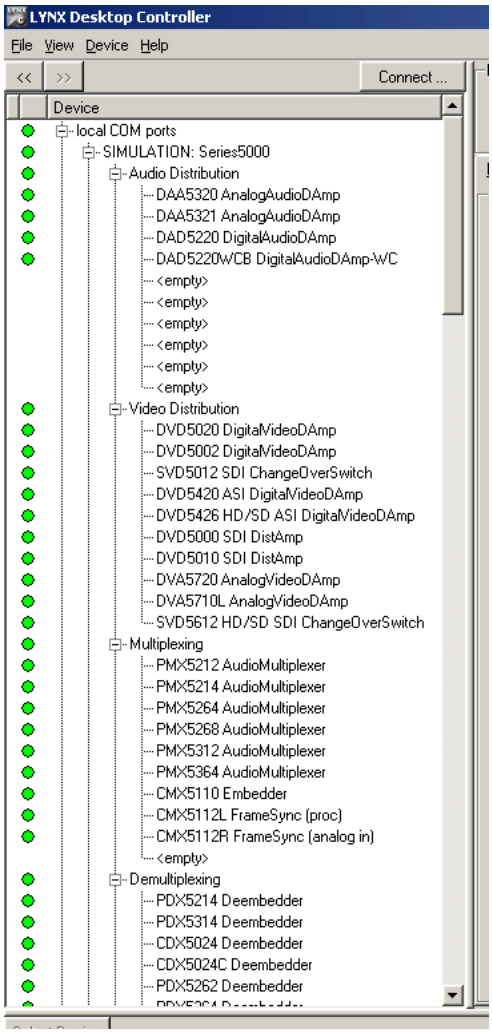
Control System Layout



The above screenshot shows the normal layout of the control system GUI. The descriptions below provide more detail on each section of the GUI and its operation.

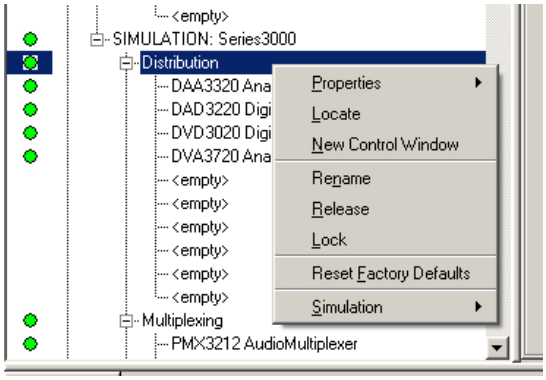
Device Tree

1 This area is organized like a standard windows folder tree and is where all controllers and modules detected by the system are displayed. The modules attached are arranged under each controller.



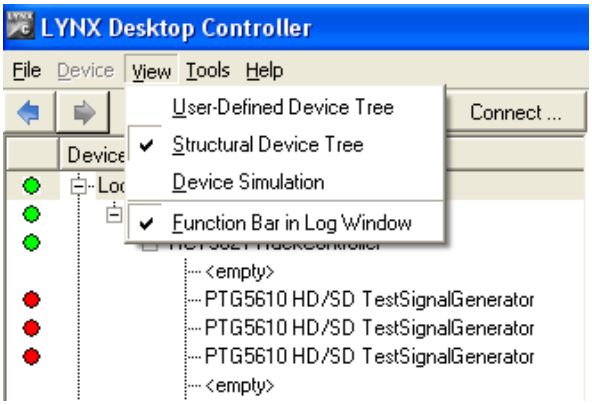
- Clicking on any device in the folder tree will display the associated GUI for control of this device. Next to each device there is a small colored dot. This is a graphic representation of the Alarm LED next to each module listed for easy identification of problems within the system.
- Levels can be collapsed and expanded so only the information required is displayed in the folder tree. This is useful for systems with a large number of racks and modules.
- If a module is removed or added to the system then this will be detected automatically and added / removed from the folder tree. This also triggers an event in the event log (5) to indicate when this change was made to the system.

- By clicking with the right mouse button on the selected module a pop up window with additional controls for the selected module will be shown.



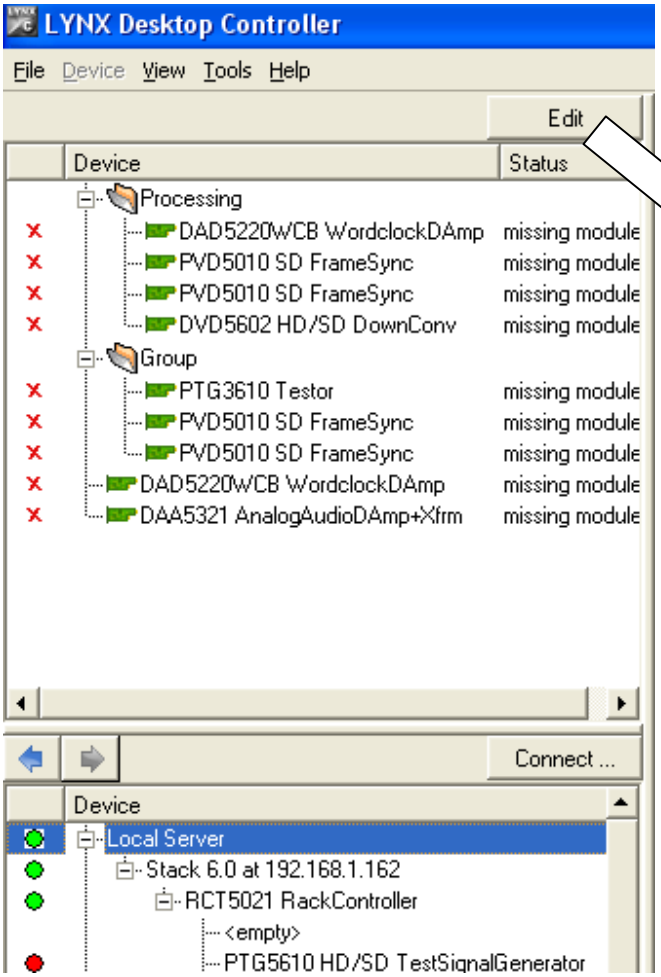
User Defined Device List

A user defined device can be created by each user.

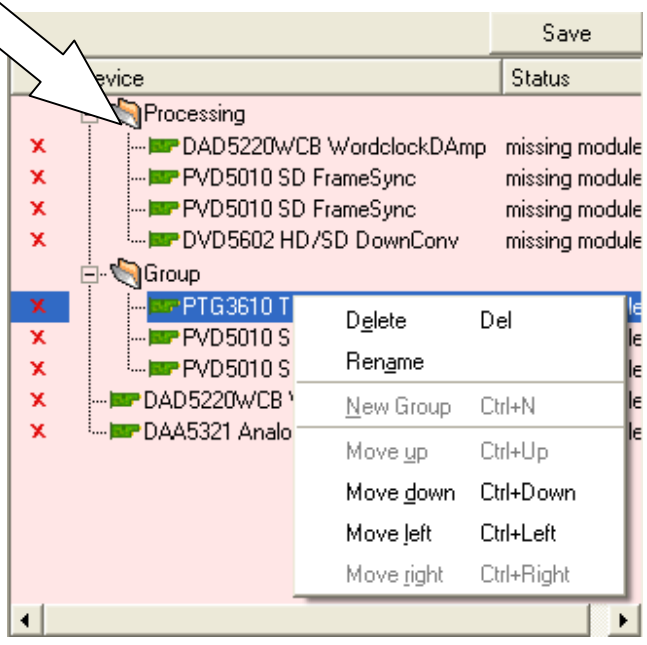


Select the User Defined Device list in the TAB “View”.

A second list, which can be edited, will show up.

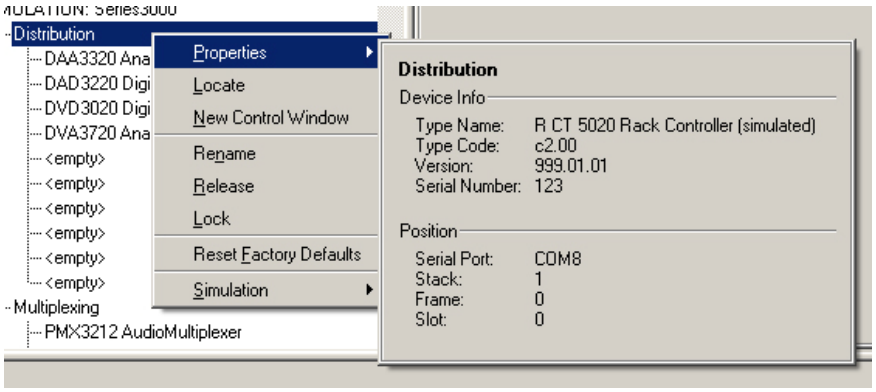


Select “Edit” mode, then you can drag&drop devices from the standard device list to the user defined device list, create own groups etc.



Module Properties

- Selecting **Properties** will give additional information about the module. This is information which is also important in case of service issues



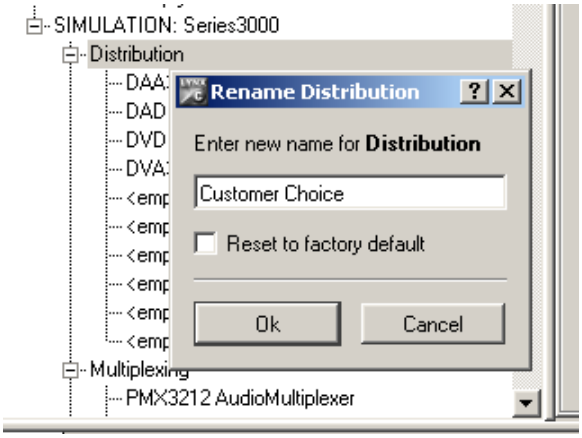
- The **Locate function** is described below

New Control Window

- **New Control Window** opens an additional window for control of the selected module. With this function several control windows can be opened simultaneously showing various control tabs and/or modules.

Module Rename

- **Rename** allows to change any module name with a user defined description.
  The names are stored on the R CT 5031 and are linked to the slot and module type. If a module is replaced with the same type of board the names are retained.



- **Release** will force the module to store all current settings to be written into the on-board Flash memory

Note: After changing any parameter the module will write the changes to the Flash memory automatically after 10 seconds of the last change. The LEDs on the board as well the indicators in the GUI will flash yellow during the write process.

- To avoid any unwanted changes of settings all controls of the selected card can be **Lock**ed. All control elements of this card will be greyed out then.

- If at any time it is necessary to return the module to the factory default settings this can be done using the "**Restore Factory Default**" function. You will be prompted if you are sure, as this will erase any stored information from the module flash ram and set it back to the factory settings.

- **Simulation** is only active when the simulation mode of the c3_local application is selected

Module Title Area

2 This is the main title area where the description of the module can be found, details on its physical location in the system (Rack number and Rack Slot) as well as the device SW version

This area also displays the status of the module and describes any reported error next to the colored dot (which is also a mirror of the module LED)

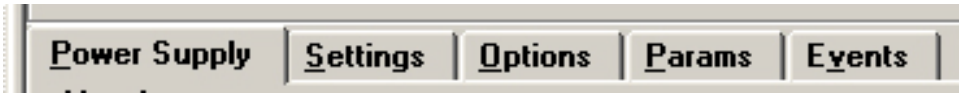
Locate Function

For larger systems which may have multiple cards of the same type in a single rack, or multiple racks in a larger system we have added a useful utility which will help to physically locate a suspect module in a rack quickly.
When Locate is selected the status indicator on the GUI and the alarm LED will flash yellow in the following continuous sequence.
3 short flashes…. Pause…. 3 short flashes …
The LED continues to flash in this way until the function is turned off in the GUI.

Use of the locate function will not interfere with the normal operation of the module.

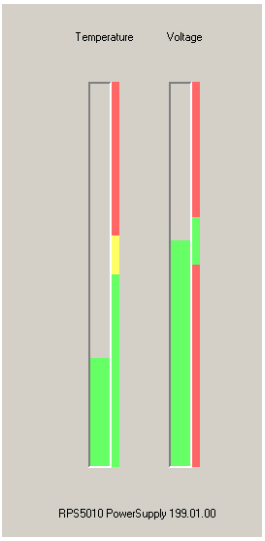
Control Tabs

3 This is the main control area for the module and changes depending on which module is selected in the folder tree. This area has several tabs that will take you into different areas of control for the Module. The number of tabs will vary depending on the type of module , for the controller you find **Power Supply – Settings – Options – Params – Events**



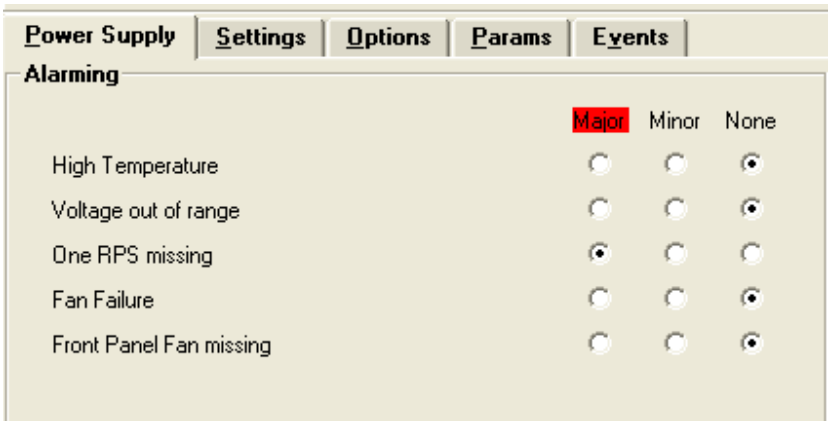
Power Supply Tab

Power Supply. This tab is the default display and brings up the primary controls for the controller.



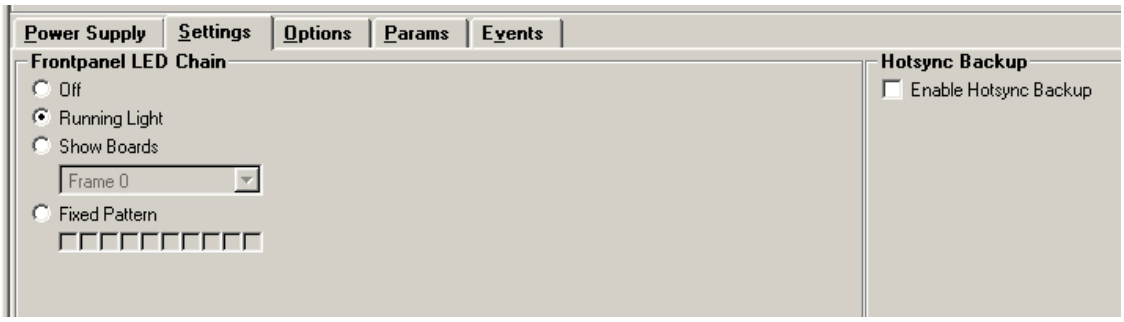
- It shows the status of the power supply voltage as well as the rack temperature
- It shows the status of the power supply voltage as well as the rack temperature

- Alarms (two levels) for different failure modes in the rack frame can be set for triggering of the GPO contacts.



Settings Tab

Settings. This tab allows for setting of the 10 “running LEDs” at the card front edge and the activation of the function **Hotsync Backup**.



Hotsync

Hotsync is a feature built into the control system that is a way for all module settings and configurations to be stored in the R CT 5031 Controller. Currently all module settings are stored in Flash Ram within the module which survive module removal / power cycles and even long term storage. The Hotsync function supplements this with another level of convenience.

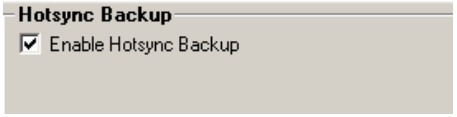
Once enabled Hotsync will remember all the settings and configurations for all modules installed in a Series 5000 Rack or a complete stack connected to the R CT 5031. This way when a defective module is “hot swapped” the settings that were previously used are written into the new module. No switches to set, nothing to calibrate, plug and play convenience.

The Hotsync function is totally automatic and runs in the background. This function requires no user intervention once enabled in the GUI.

NOTE: *Hotsync is only available for Series 5000, modules of Series 3000 are not supported*

Switching on Hotsync

The Hotsync function is off by default and needs to be enabled in the control system GUI. Highlight the R CT 5031 in the folder tree and select the “Settings” tab. Here you will see a checkbox to turn this function ON or OFF.



Note. The Hotsync function is specific to each R CT 5031 and R CT 5021 controller and will need to be enabled for each controller of these types used in your system. The RCT 5031 and R CT 5021 automatically supports any racks with R CT 5010 bus expanders that are connected to a host RCT 5031 controller.

Hotsync Function

The Hotsync function has useful applications and below describes how the system works under various situations

Board failure "Hot Swap'

Typically when a failure occurs it is important to get the system back online as quickly as possible. Some LYNX modules are complex and have a lot of user settings and configurations that have been set for the specific application. Having to manually reset all the parameters in the new card can be time consuming and prone to errors. Hotsync takes care of this automatically. When the system detects a hot swap of a particular card, Hotsync will automatically restore all the previously used settings into the new module. This process is automatic and takes a couple of seconds.

Note. A card of the same type must be exchanged for HotSync to restore settings correctly. If a board of different type is inserted HotSnyc will not be executed..

System Changes

During normal operation the settings in the system can be changed or tweaked over time. Hotsync detects these changes when made and will automatically sync the revised module data into its local memory. At all times the Hotsync stored data is 100% – no user intervention is required.

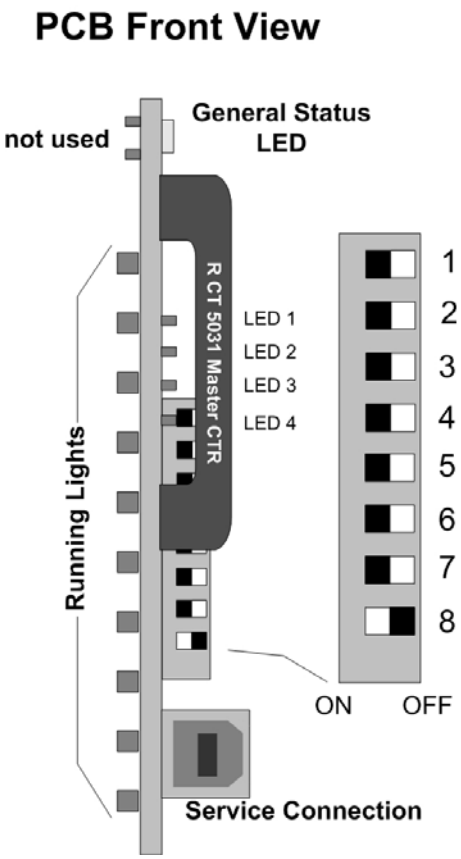
System Expansion

There are times when additional modules, or a new rack with an R CT 5010 expander added to a system during system expansion. Hotsync will detect any additions and automatically register the new hardware and store the settings – no user intervention is required.

Note. After a power cycle the Hotsync function will not be functional for 15 seconds. Any modules hot swapped in this period will not be restored with the previous settings; the specific module settings will be used.

Hotsync Indications

Once the Hotsync function is enabled the process is fully automatic. There are some indicators on the RCT 5031 Controller card that indicate status.



Hotsync ON – LED 1
This LED is illuminated when Hotsync is switched ON.
When Hotsync is restoring data to a module this LED will turn off for one second.

Hotsync SAVE – LED 2
When Hotsync is saving new data LED2 will turn on for one second this indicates Hotsync has synchronized its stored settings with the installed modules. This will happen if settings are changed in any module or if new hardware is added.

Note
Hotsync is a utility designed to automatically maintain a system which is switched on and operational and makes the assumption that any hardware which is inserted into the system will need the settings restored back into the new module. If there is ever the situation where you would like to replace a card but retain the settings stored in this card then please follow the procedure below.

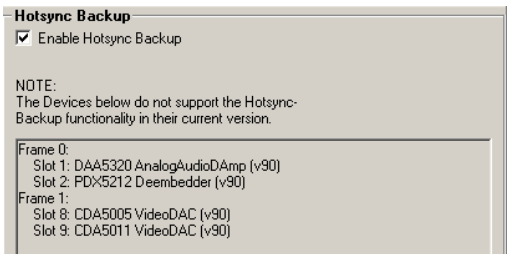
1. Observe **LED 1** on the RCT 5031 Controller, if ON Hotsync is enabled. Disable this function in the GUI and confirm this LED is **OFF**

2. Install the new card (hot plug – no need to power down)

3. Switch Hotsync back on using the GUI, **LED 1** will switch back ON

4. The setting stored within the new module will be preserved and will automatically Hotsync into the backup file.

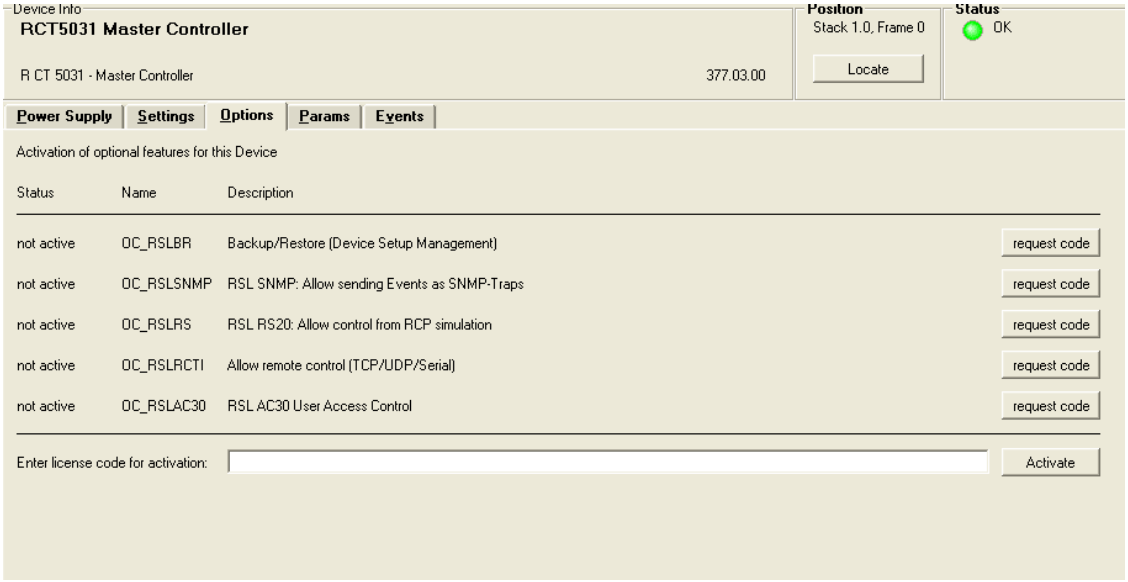
Note.
Some older Series 5000 cards will not **support the new Hotsync feature. Modules that are not supported are identified in the GUI when the Hotsync** function is enabled.



Any modules identified will require re-programming with the latest revision of firmware so this feature is supported. Please contact your authorized dealer or LYNX Technik directly for further assistance.

Options Tab

One tab on the GUI is reserved for “Options“. This is where the option license codes are entered to unlock the embedded firmware options.



If the module was purchased with options pre-installed then you will see the option status as green (Active).

If you would like to add any option after delivery, then you will need to purchase the specific license codes from LYNX Technik.

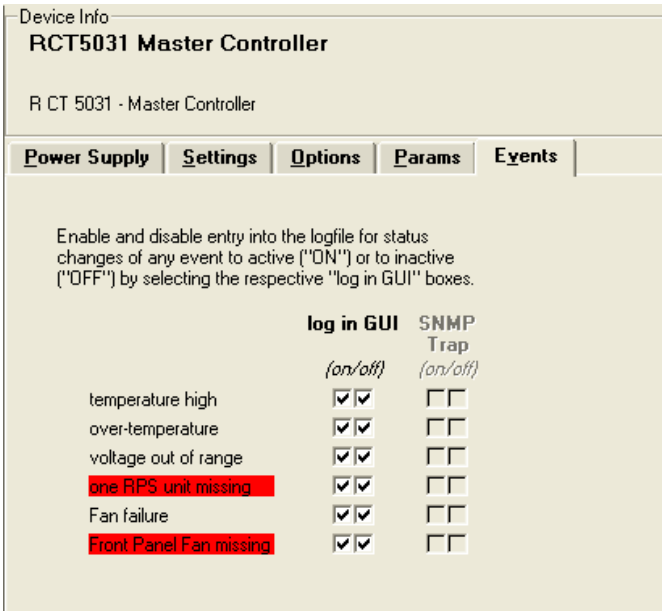
Click the “request code” button next to the channel you wish to activate. A number will be displayed, Please forward this number with your purchase order to your authorized LYNX dealer or representative. When you receive the license string simply type it (or paste it using the windows clipboard) into the area provided and press “activate”.

Activation is confirmed when the option status turns green.

Events Tab

The Events Tab is where error notifications are configured for the module.

The GUI has an integrated error log, which is a simple text log file stored in the controller PC. This will record an event and timestamp it. The log can be seen at the bottom of the GUI screen and can be scrolled through using the scrolling bar. Events are always logged into c3_local.logfile.txt. The checkboxes (see screenshot below) enable or disable the display of error messages to the GUI log window saving to the logfile cannot be disabled.



Log in GUI Function

Events are selectable, you can chose if you want to record a particular event in the log (or not) or configure it to only record one side of the event. (*For example you might want to log when a power supply is missing but do not want to log when it came back*). The ON/OFF trigger can be configured for each of the available events shown in the list and is setup using the checkboxes provided.

SNMP Support

If the system is using a RCT 5031 Master Controller and the SNMP option is installed then the “SNMP Trap” columns become available.

Here you can configure what events you would like to transmit a “SNMP trap” for over the network. (This has no impact or influence over the internally error log maintained by the LYNX control system)

(Internal LYNX error logging and external SNMP traps can be configured independently).

> **Note.** *The simulated event is part of the GUI simulator and allows us to force a particular error condition for testing and demonstration purposes.*

Event Logging Area

4

This is the error logging area of the GUI and is the central repository of all errors encountered by the system.
Note. The messages in the log window can be erased, but a log file is stored in the R CT 5031 not the individual modules. Each time an error condition is encountered and entry is automatically made in the log. All entries are time stamped and can be sorted in any of the columns provided by clicking on the column headers.

Software Updates

From time to time we update the software to add support for new modules or new features. Updates are supplied free of charge. You can contact us directly or check our web site for any available updates.

Software Version Number

To determine the release and version number of the Appolo Control GUI software installed on your system. Pressing **F1** or selecting the **Help** drop down menu and then **About** will display the splash screen.

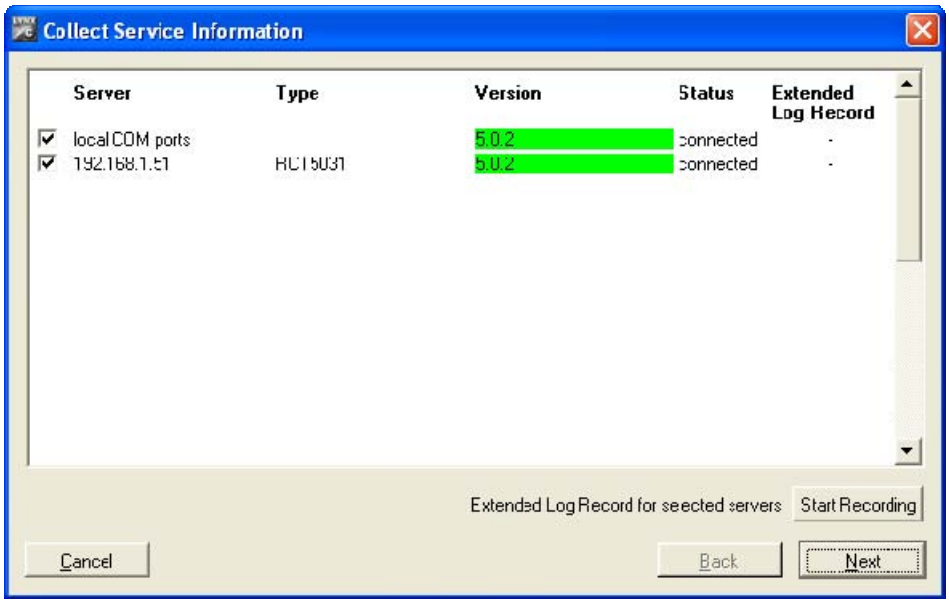
SW Versions of the embedded server of the R CT 5031 can be found in the Configuration Web IF (see page 38) or if you click on the IP address in the device list in the Appolo Control GUI (see page 46).

Reporting Problems

If you are experiencing problems with your installation please contact us for assistance. We will require some information which is maintained by the system:

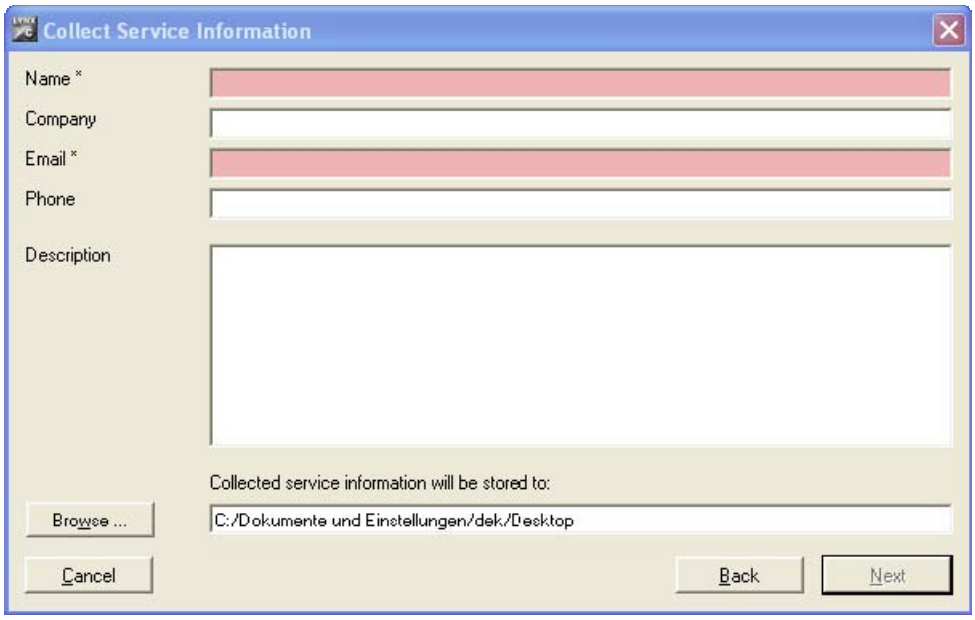
Please use Collect Service Information in the Help Tab of the Appolo Control GUI.

The following screen will display.

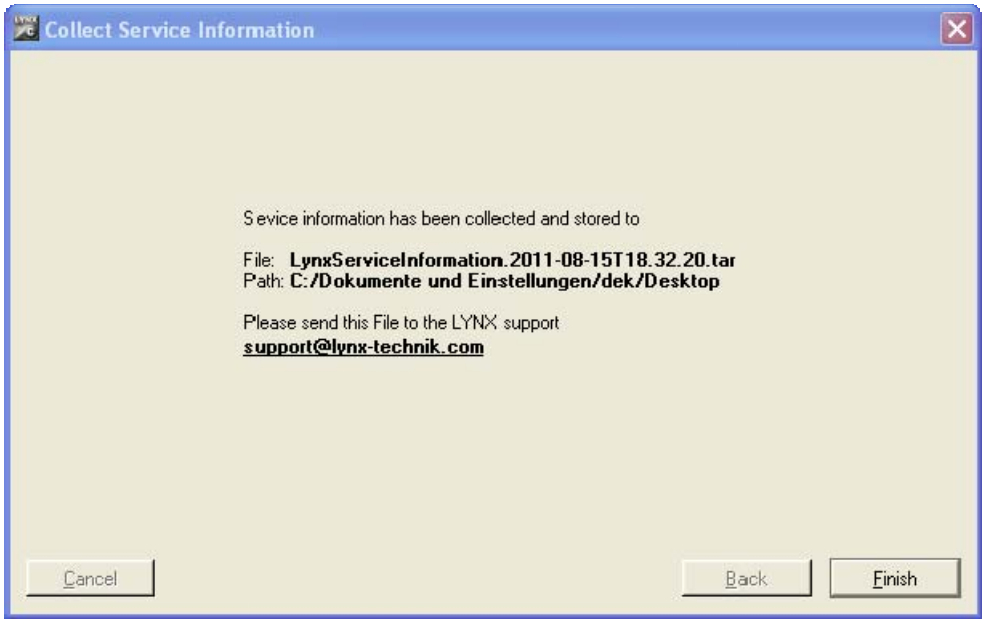


Please start process by clicking **Next**, when the scan is finished please acknowledge again by clicking **Next**

The next window will ask for some personal info. Please fill out and acknowledge again with **Next**.



All information will be collected into one file. Please add as much information as possible into the description field provided.



We will ask you to E-Mail this to:

Support @ lynx-technik.com

Specifications

Electrical Specifications	
Operating Voltage	+ 12VDC
Power Consumption	Approx 3.0VA
Safety	IEC 60950/ EN 60950/VDE 0805
Mechanical	
Size	283mm x 78mm
Weight	Card module 120g
Ambient	
Temperature	5°C to 40°C Maintaining specifications
Humidity	Max 90% non condensing
Supplied Accessories	
Documentation	Reference Manual CD

Service

Parts List

Due to the very dense design and high level of integration the module is not user serviceable. Please contact LYNX for repairs or to request an exchange unit.

Technical Support

If you are experiencing problems, or have questions please contact your local distributor for further assistance.

Technical support is also available from our website.

Please do not return products to LYNX without an RMA. Please contact your authorized dealer or reseller for more details.

More detailed product information and product updates may be available on our web site:

www.lynx-technik.com

Contact Information

Please contact your local distributor; this is your local and fastest method for obtaining support and sales information.

LYNX Technik can be contacted directly using the information below.

Address	LYNX Technik AG Brunnenweg 3 D-64331 Weiterstadt Germany
Website	www.lynx-technik.com
E-Mail	info@lynx-technik.com

LYNX Technik manufactures a complete range of high quality modular products for broadcast and Professional markets, please contact your local representative or visit our web site for more product information.

LYNXTechnik AG®

Broadcast Television Equipment