

Reference Manual

R CT 5021

**Rack Controller with RS232/422 Interface, LAN connectivity and
Control Software**

Revision 2.1 - November 2010

This Manual Supports Device Revisions:	
R CT 5021 Firmware Revision	393
Control System GUI Release	4.8.2



Information in this document is subject to change without notice. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical for any purpose, without express written permission of LYNX Technik AG.

LYNX Technik AG may have patents, patent applications, trademarks, copyrights or other intellectual property rights covering the subject matter in this document. Except as expressly written by LYNX Technik AG, the furnishing of this document does not give you any license to patents, trademarks, copyrights or other intellectual property of LYNX Technik AG or any of its affiliates.

LYNX Technik AG
Brunnenweg 3
D 64331 Weiterstadt
Germany
www.lynx-technik.com

Contents

WARRANTY	4
REGULATORY INFORMATION	5
Europe	5
USA 5	
GETTING STARTED	6
Packaging	6
ESD Warning	6
Preventing ESD Damage	6
PRODUCT DESCRIPTION	7
FIRMWARE OPTIONS	7
Backup / Restore (R SL BR20)	7
R CP Simulation (R SL RS20)	7
INSTALLATION	8
CONTROLLER REMOVAL	9
FUNCTIONAL DIAGRAM	10
MODULE LAYOUT	11
CONTROL SYSTEM TOPOLOGY	12
CONNECTIONS	13
Service Connection	13
System Connections	13
Alarm Connection	14
Alarm Function	14
Extend Connection	14
Control Connection	15
LAN Connection	15
Configuration Examples	16
Single Controller System	16
R CT 5021 used with R CT 5010	16
R CT 5021 used with R CT 5031	17
Configurations via Network	18
SETTINGS AND CONTROL	20
Dip Switch Settings	20
Switch Function Detail	20
Rotary Switch Function	21
Factory Preset Condition	21
ALARM/LED STATUS INDICATORS	22
Running Lights	22
General Status LED	22
Controller Status LED's	22
NETWORK CONFIGURATIONS	23
How to attach a R CT 5021 (Network Configurations Editor)	23
Controller Network Configuration (Network Component Configuration)	25

Setting IP Addresses	25
Activation of DHCP Mode	25
Ethernet Web Admin Interface	26
Ethernet Admin Console	27
LYNX DESKTOP CONTROLLER SOFTWARE.....	28
System Requirements	28
Software Installation	28
Starting the Controller Application	31
Software Updates	31
Software Version Number	31
Reporting Problems	31
Software Operation	32
Control System Layout.....	32
Device List	33
User Defined Device List	34
Module Properties	35
New Control Window	35
Module Rename.....	35
Module Title Area.....	36
Locate Function	36
Control Tabs	36
Power Supply Tab.....	37
Settings Tab	38
Hotsync	38
Switching on Hotsync.....	38
Hotsync Function	39
Hotsync Indications	40
Options Tab.....	41
Events Tab	42
Log in GUI Function	42
SNMP Support	42
Error Logging Area.....	42
Specifications	43
SERVICE	44
Parts List	44
Technical Support	44
CONTACT INFORMATION.....	44

Warranty

LYNX Technik AG warrants that the product will be free from defects in materials and workmanship for a period of two (2) year 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 RESPONSIBILITY 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, INCIDENTAL, 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 D-64331 Weiterstadt Germany
<i>Declare under our sole responsibility that the product</i>	
TYPE: R CT 5021	
<i>To which this declaration relates is in conformity with the following standards (environments E1-E3):</i>	
EN 55103-1 /1996	
EN 55103-2 /1996	
EN 60950-1 /2006	
<i>Following the provisions of 89/336/EEC and 73/23/EEC directives.</i>	
	Winfried Deckelmann
Weiterstadt, March 2009	
<i>Place and date of issue</i>	<i>Legal Signature</i>

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 5021 is a controller option for the R FR 3010/3011 and R FR 5010/5011 Rack Frame assemblies and provides remote control, status monitoring and error reporting for all LYNX modules installed in the rack.

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 5021 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. This controller supports serial RS232 or RS422 control interfaces as well as Ethernet LAN connectivity. Other options available are:

R CT 5010. Bus Expander. This is designed for use with a host R CT 5021 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.

NOTE: The R CT 5010 is available for Series 5000 rack frames only, i.e. R FR 5010 or R FR 5012. It is not for use in Series 3000 assemblies.

R CT 5031. Master Controller. For larger systems the Master Controller R CT 5030 is provided. When used with the Master Software control package this provides network connectivity, a browser style interface and standard TCP/IP communications. This option is also required for the support of SNMP error reporting. The Master Control Software package is also equipped to take more advanced plug in control options LYNX has under development.

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.

Backup / Restore (R SL BR20)

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

R CP Simulation (R SL RS20)

The addition of this option will enable a SW simulation of the R CP 5000 HW panel

Installation

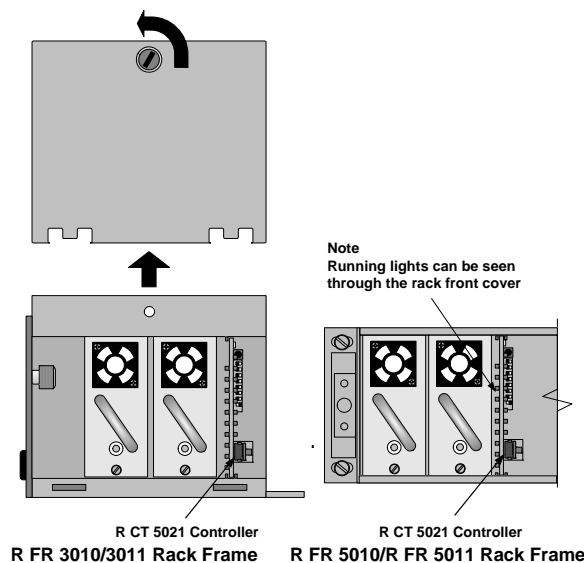
If this module was supplied as part of a system it is already installed in the rack enclosure. If the module was supplied as a field upgrade please follow the installation procedure below.



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

We recommend you power the rack down before installing any additional modules into an existing card frame although the R CT 5021 supports hot swapping.

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 5010/5012 Card frame and the R FR 3010/3011 Card frames both have a slot configured for the R CT 5021 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 few seconds for the control system to "discover" the new module)

NOTE. The use of the optional control system is **mandatory** for the control and setup of this module. If you do not have the control system, then please contact your LYNX representative for details on how to upgrade your rack with the LYNX control system.

Controller Removal

The R CT 5021 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.

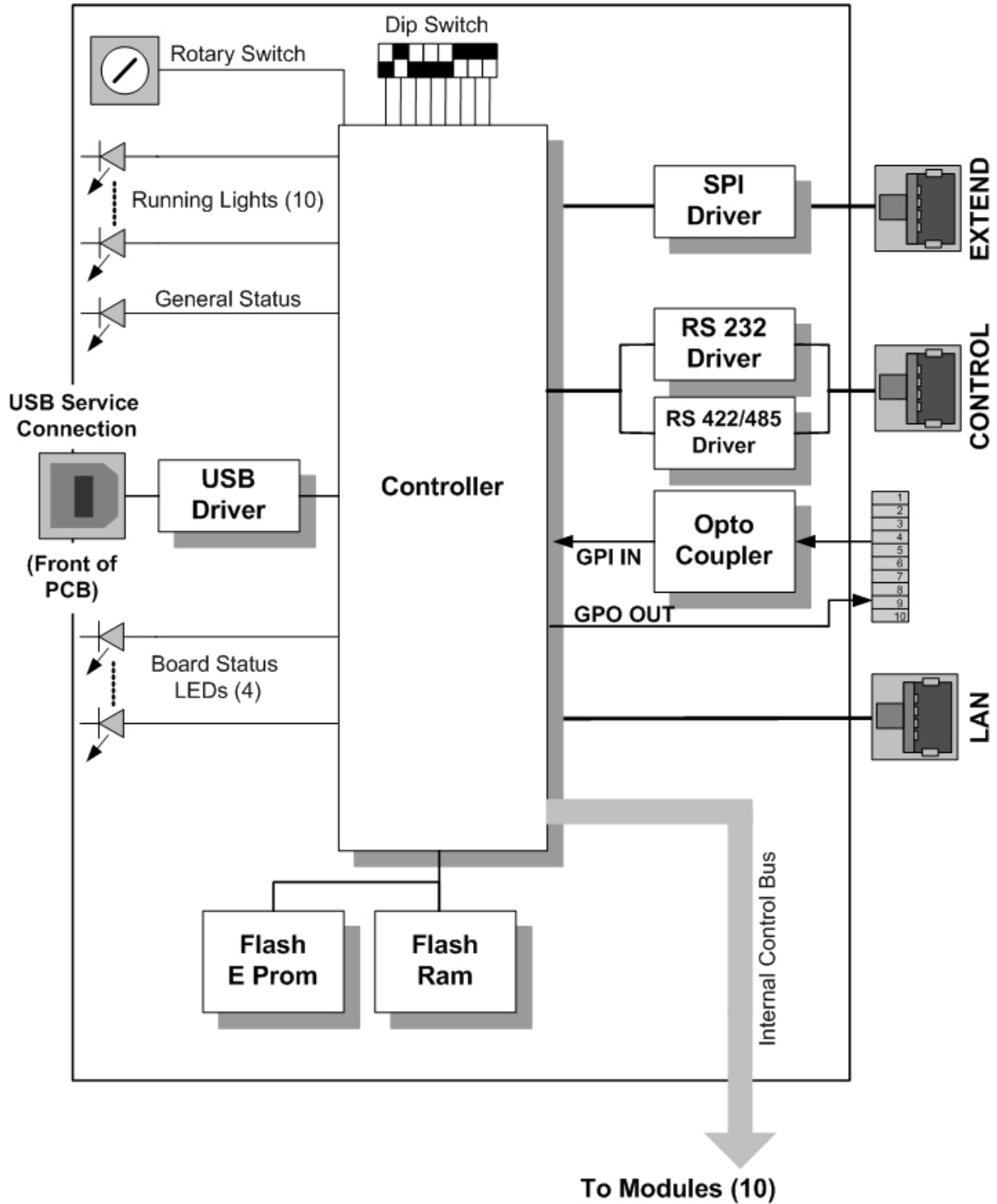
If the system is configured with multiple R CT 5021 controllers in multiple stacks then only the stack with the RCT 5021 controller removed will not be accessible from the control system, all remaining stacks will appear as normal on the control system.

NOTE: *If hot swapping an R CT 5021 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 5021 it will automatically initialize and start running. This can be seen when the running lights start to cycle. After a few seconds the control software will detect the presence of the new controller and all modules attached will be accessible from the control system.

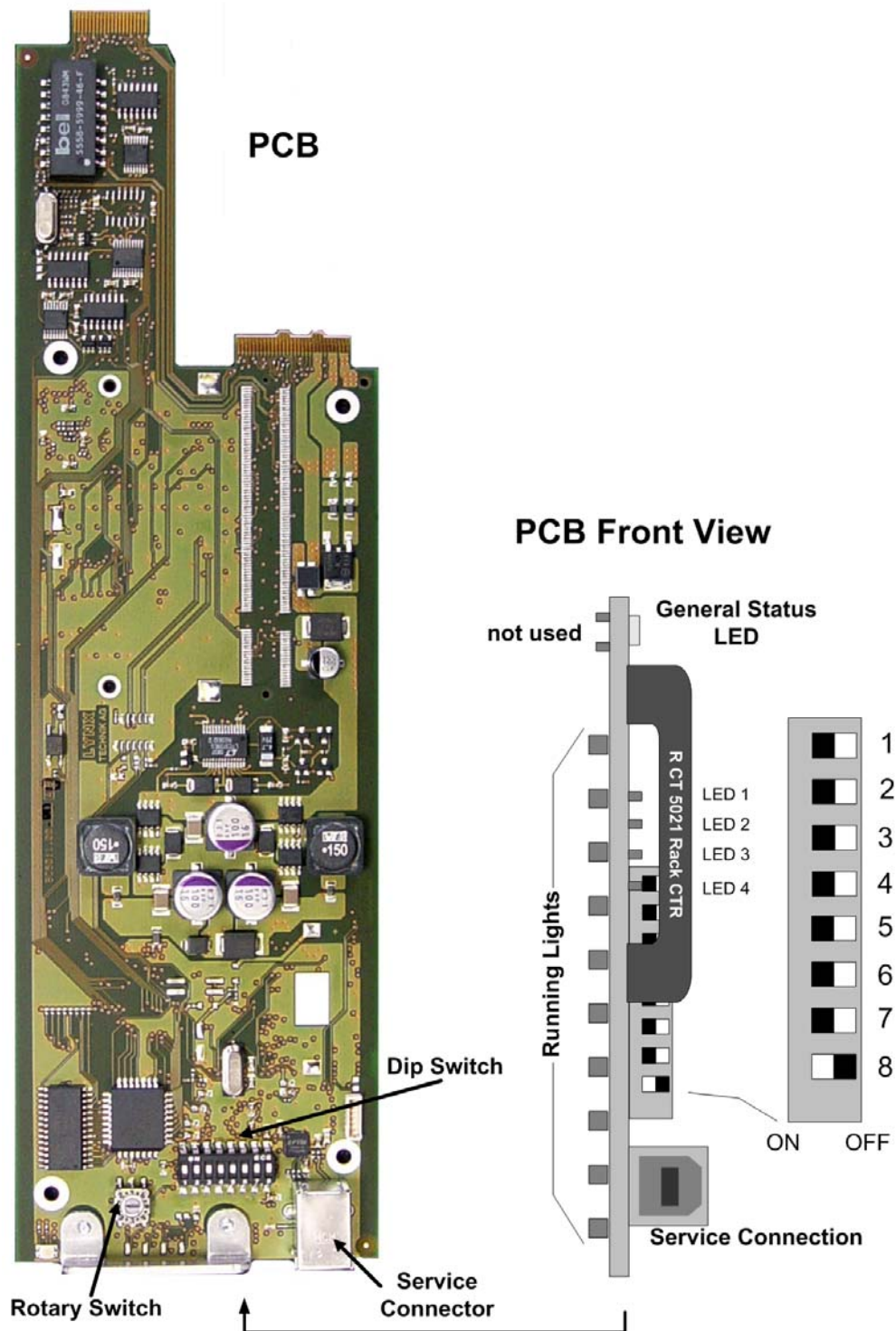
Functional Diagram

Below is the basic functional diagram for the R CT 5021 CardModule.



Module Layout

Below the physical layout of the R CT 5021 CardModule and the locations of the various controls / connections and indicators is shown:



Control System Topology

Before using the R CT 5021 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 Series 5000 rack frame or the R FR 3010/3011 Series 3000 rack frame.

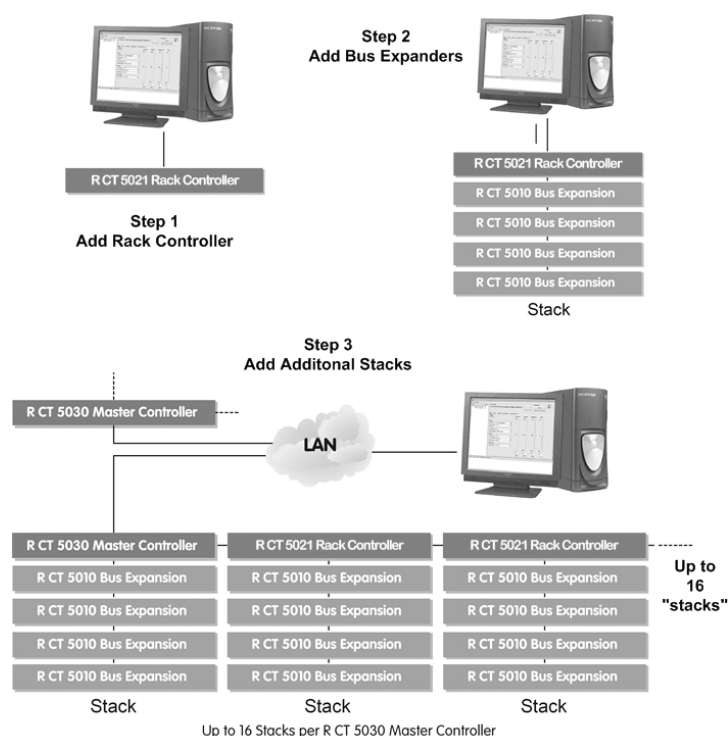
Expansion will involve adding R CT 5010 Bus Expanders and R CT 5031 Master controllers where necessary. No two systems are alike and there are some physical limitations that need to be considered when configuring a system. This is mainly in the area of interconnections that relates directly to the physical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

When moving beyond a single rack there are 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 very 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. Total cable length for this connection is limited to approx. 1.5m in the R FR 5010/5011 and approx. 10m in the R FR 5012.

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 or Ethernet connectivity between the racks. A single Master controller can support up to 15 x R CT 5021 Rack controllers. Total cable length for all connections is 250m in RS 485 mode.

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



Connections

Service Connection

The R CT 5021 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 CONTROL 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.*

While in Ethernet mode, setting DIP switch #8 to ON will enable an Ethernet admin console on this connector. For more details see below (chapter “Ethernet admin console”)

System Connections

All external connections to the controller are made through the integral termination panel in the rear of the R FR 5010/5011, R FR 3010/3011 and R FR 5012 Rack Frames

Please see the R FR 5010/5011 or R FR 5012 manual for description of the physical connections.

Alarm Connection

An external alarm connection is available from the rack.

Please see the R FR 5010/5011 or R FR 5012 manual for description of the physical connections

Alarm Function

The user can assign triggers for the preferred Major / Minor and No Alarm conditions using the controller and supplied software.

The alarm connector provides GPO contacts for 2 alarm levels and a GPI input for future use. This allows for the connection of an external monitoring system. Alarm conditions are triggered by the 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** and **Alarm Common**. Some 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** and **Alarm Common**. Some examples of “major” failures in the rack are:

- Loss of Power

Note: See below in the paragraph “Software Operations” how to set Alarms with the R CT 5021

Extend Connection

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 RCT 5021 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 respective manuals of the R FR 5010/5011 and R FR 5012 manual

Note. When using this interface all connected racks must be mounted close together, as the distance of this interface is restricted. Please refer to the R CT 5010 Rack Bus Expander reference manual and/or the R FR 5010/5011 and R FR 5012 manual for more details on this interface and the cables required.

Control Connection

An external Control Interface is provided on the rear termination panel. When an R CT 5021 Rack 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 control software.
Note: The R CT 5021 has to be in serial control mode.
2. When configured for RS 422 operation this port is used to connect other racks fitted with R CT 5021 Rack controllers with a Master Controller R CT 5031 (up to 15 additional racks).
Note: The R CT 5021 has to be in serial control mode.

Note: Please see details on the DIP Switch settings for switching in between the different modes for the control interface

Connection details can be seen in the respective manuals of the R FR 5010/5011 and R FR 5012 manual

LAN Connection

The R CT 5021 can be connected to the control system also through an Ethernet Port (LAN). This can be activated setting DIP switch 5 to ON (see below: DIP switch configuration).

The R CT 5021 can be attached to a PC directly (replacing the RS232/422 connection) or to an R CT 5031 (replacing the RS485 connection).

Note: How to attach an R CT 5021 to a PC or an R CT 5031 is described below in the GUI section

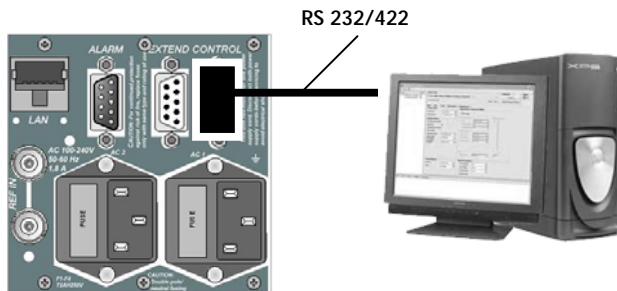
Configuration Examples

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.

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.

The R CT 5021 can be connected to a PC also through the Ethernet port (LAN)



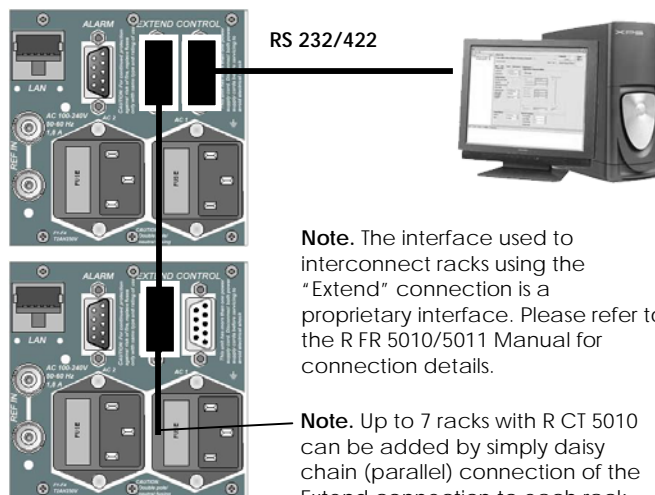
Note. The connection is a RS 232 connection that is limited in length (3m max). If greater distances are required between the host rack and PC, then the controller port should be configured to RS 422* and a RS 422 to RS 232 converter placed near the PC (not supplied)

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

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.

Host Rack with RCT 5021



Note. The interface used to interconnect racks using the "Extend" connection is a proprietary interface. Please refer to the R FR 5010/5011 Manual for connection details.

Note. Up to 7 racks with R CT 5010 can be added by simply daisy chain (parallel) connection of the Extend connection to each rack.

Expansion with RCT 5010

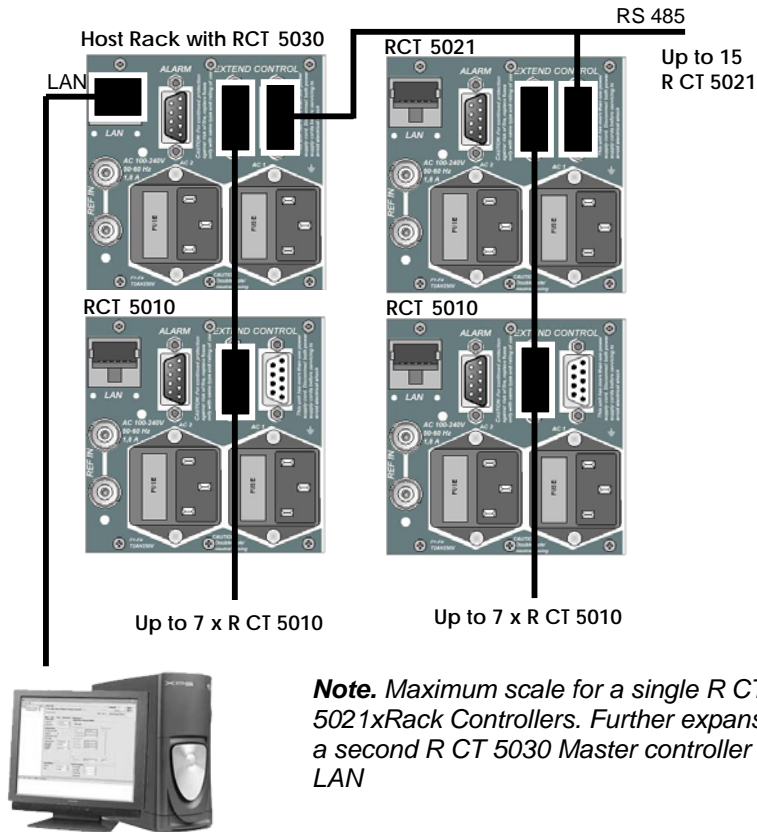


When using the R CT 5010 it is necessary to have the racks in very close proximity [preferably stacked on top of each other in the same 19" rack] as the max length of the cable to interconnect the racks is limited (1.5m). If

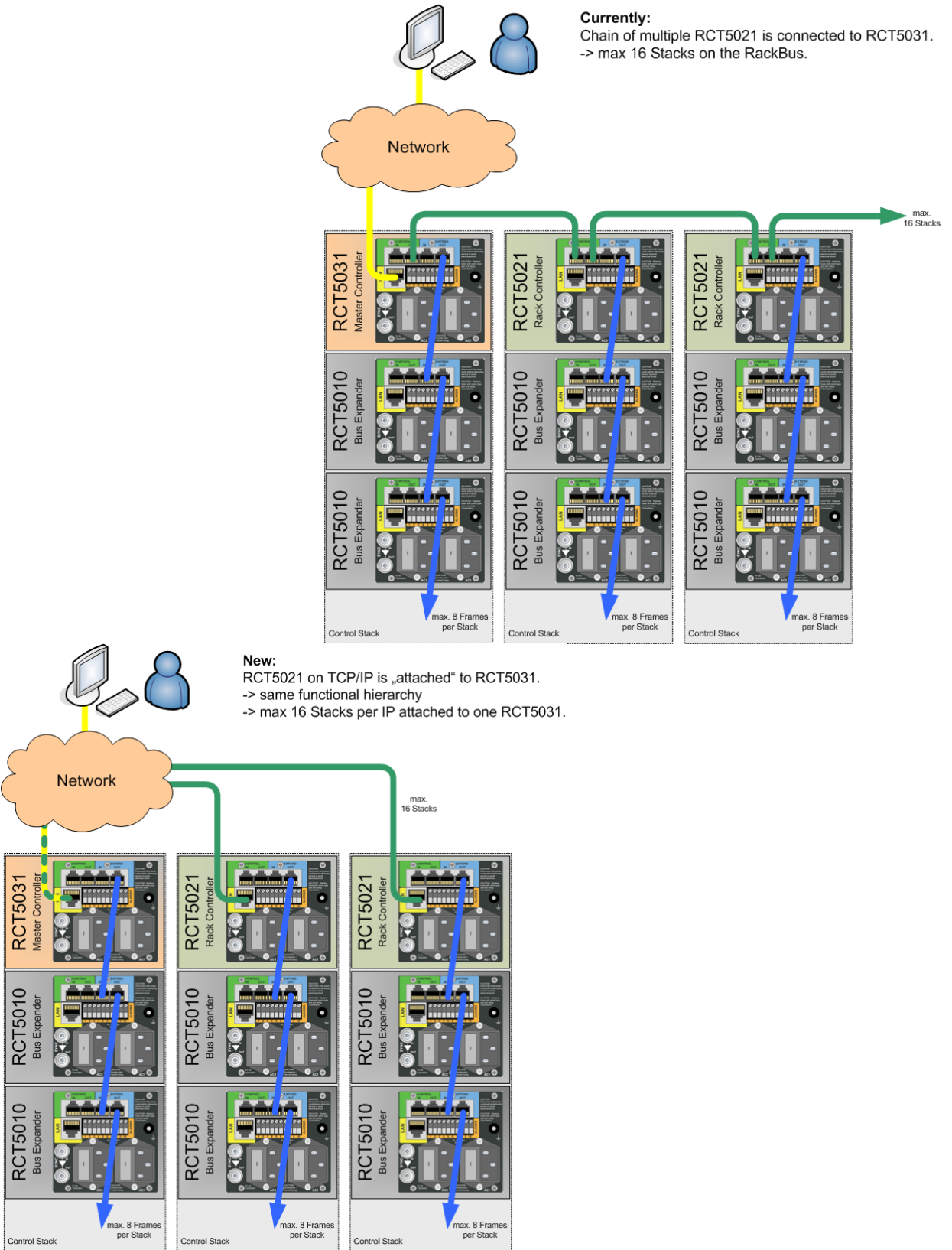
larger distances are required between racks then the use of a R CT 5030 Master controller and multiple R CT 5021 Rack controllers is recommended.

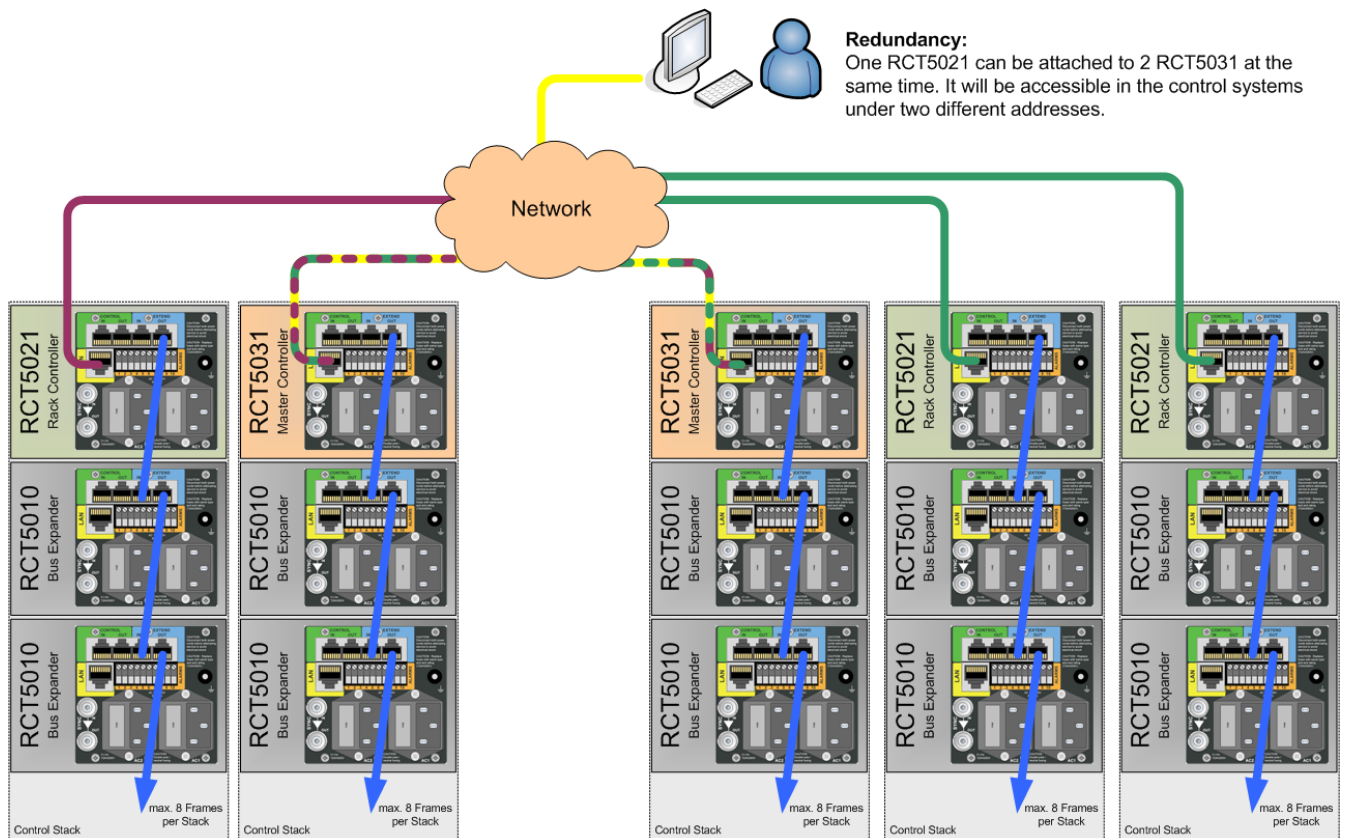
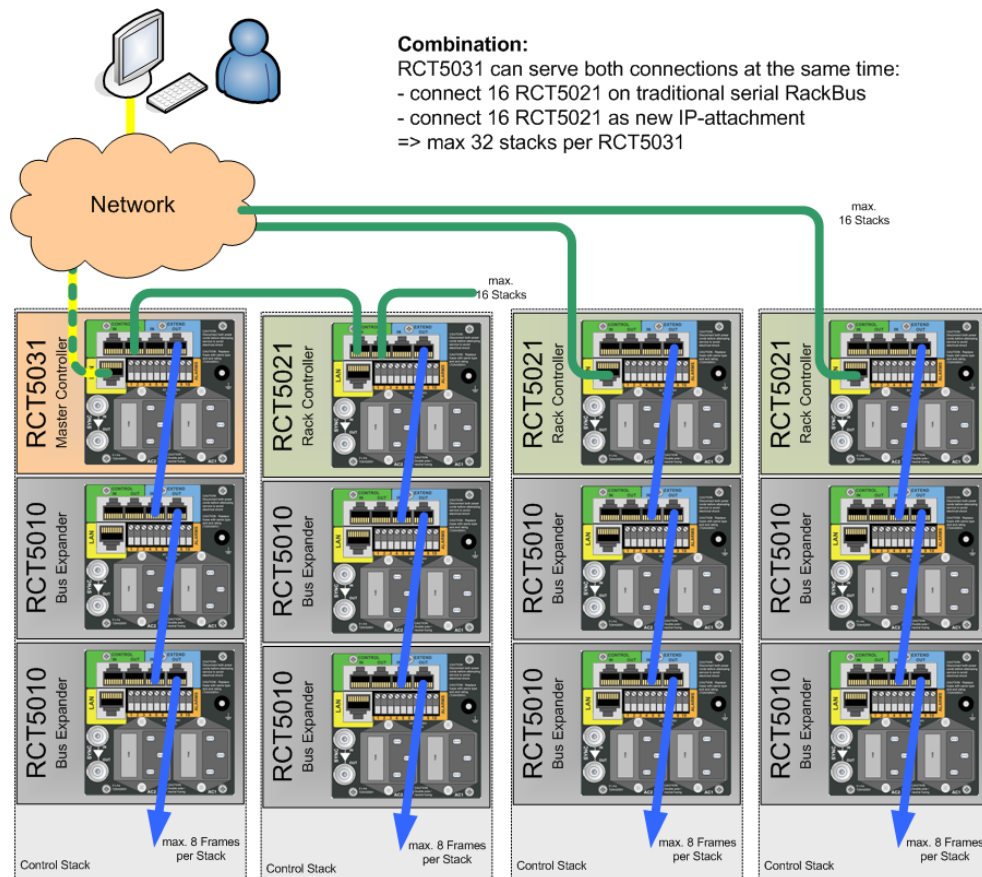
R CT 5021 used with R CT 5031

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 Please refer to the R FR 3010/3011 or R FR 5010/5011 rack frame manuals for cable wiring





Settings and Control

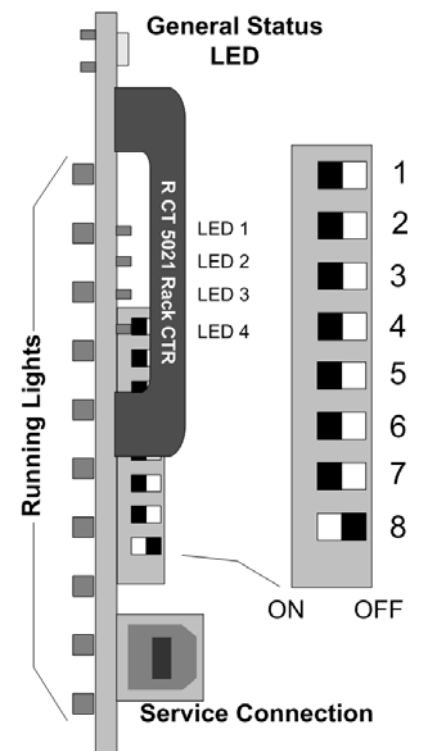
The R CT 5021 has integral switches that are used for configuration of the controller.

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	Reset Passwords of Ethernet interface
	OFF	
3	ON	For Future Use
	OFF	For Future Use
4	ON	CONTROL Port = RS422/485
	OFF	CONTROL Port = RS 232
5	ON	CONTROL via Ethernet
	OFF	CONTROL via serial ports (RS232/422)
6	ON	For Future Use
	OFF	For Future Use
7	ON	For Future Use
	OFF	For Future Use
8	ON	Enable Ethernet admin console
	OFF	Local connection for LYNX control system

PCB Front View



Switch 1– Reserved for future use

Switch 2 – Using this switch will reset all passwords for the Ethernet Control Interface: Set Switch to **ON** position, power cycle the module and switch back to **OFF** position within 10 sec after power up.

Switch 3 – Reserved for future use

Switch 4 – This is used to configure the CONTROL port on the rear of the rack. Use RS 232 (**OFF**) if the PC running the LYNX control system is connected to this port*
Use RS422/485 (**ON**) if this port is connected to another rack with a R CT 5030 fitted

* This port can also be used in RS 422 mode for the connection to a PC but a RS 422 to RS 232 converter is required close to the PC (not supplied)

Switch 5 – This switch is used to switch between serial control connections (RS232/422/485) and Ethernet control connection (LAN). Set this switch to **ON** position for Ethernet connection and to **OFF** position for serial control connection.

Switch 6 – Reserved for future use.

Switch 7 – Reserved for future use.

Switch 8 – This switch is used to select the function of the USB front connector on the front card edge. **ON** selects an Ethernet admin console (see chapter “Ethernet admin console”), **OFF** selects a local connection to the LYNX control system running on a PC.

Rotary Switch Function

There is a small 16 position rotary switch located on the PCB (see module layout). This is used to select the controller's physical address for the serial control mode. When expanding the system beyond a single controller it is important for each controller to have a unique address. Switch is set with a small flat screwdriver.



IMPORTANT. *Each RCT 5021 in a system must have a unique physical address in the serial control mode.*

Factory Preset Condition

The R CT 5021 is delivered with stored presets for the following functionality.

Address: **1**
Switch 2: **OFF**
Switch 4 : **OFF** CONTROL Port = RS 232
Switch 5: **OFF** serial control mode
Switch 8: **OFF** service connection to LYNX control system

(unused switches are set to OFF)

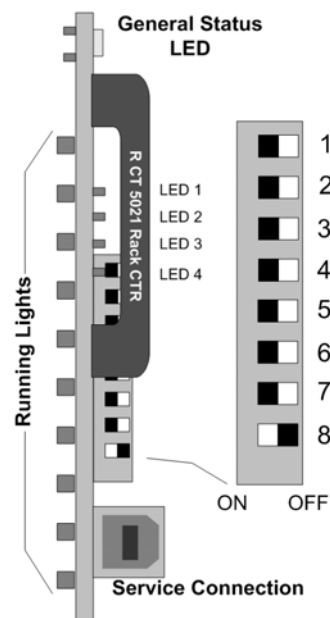
No further adjustments are needed if this is the functionality desired.

Alarm/LED Status Indicators

The R CT 5021 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.

PCB Front View



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 or crashes then these will either freeze 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	Green if CONTROL port is active

Network Configurations

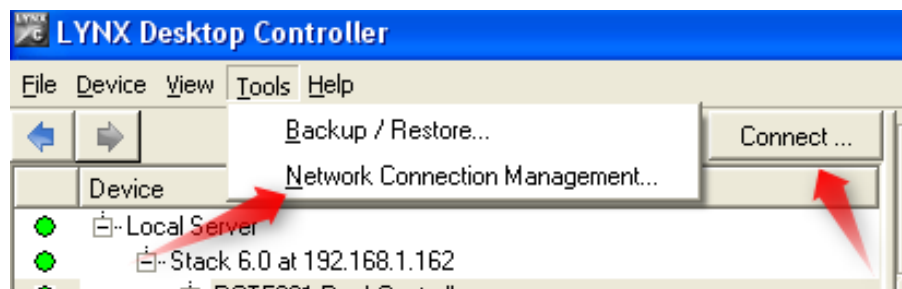
How to attach a R CT 5021 (Network Configurations Editor)

In Ethernet mode (DIP switch 5 in ON position) the R CT 5021 can be attached directly to a PC or to an R CT 5031 via the LAN connectivity.

Note: *Up to two attachments per R CT 5021 is possible.*

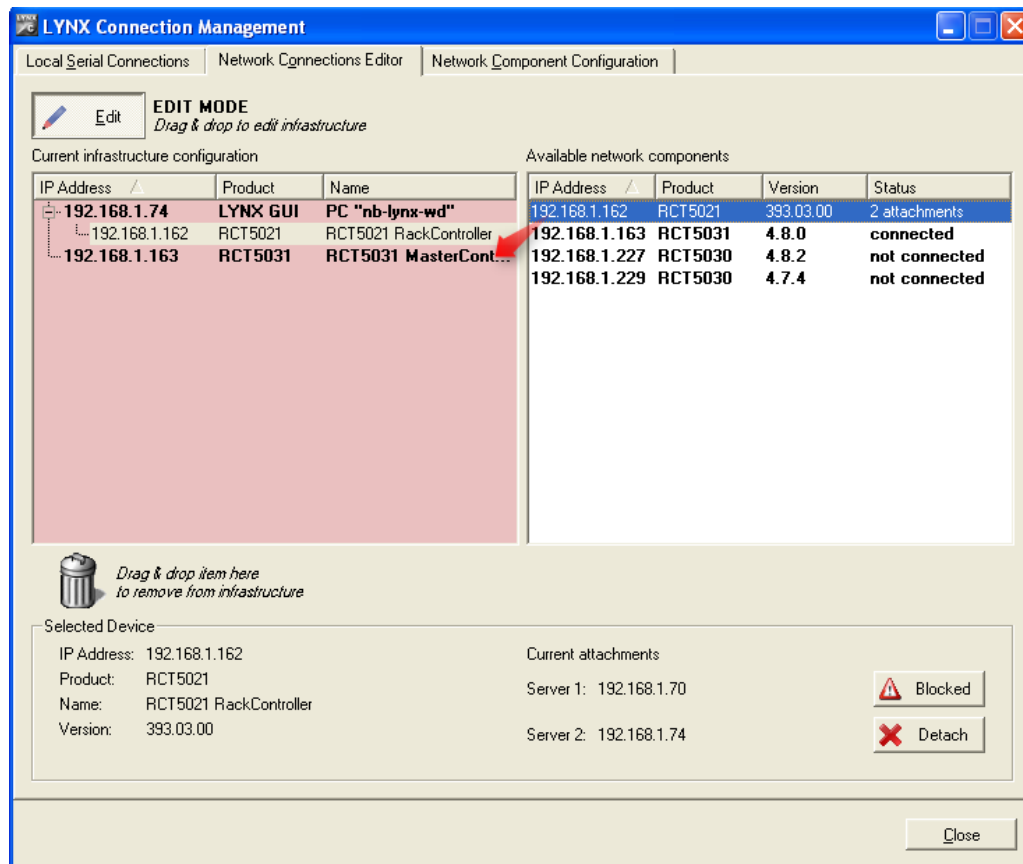
Connect the rack frame where the R CT 5021 is inserted through the LAN connector to the PC or the Network. The PC with the LYNX control SW has to be in the same Network (LAN). The LEDs in the LAN connector of the rack frame will show network activity if connected properly.

Open the Network Connection Management window in the GUI of the LYNX control SW by selecting it in the TAB "Tools" or by clicking on the Connect button.



The Network Connections Management window will open then.

Select the Network Connection Editor, select EDIT mode and drag&drop the R CT 5021 onto the PC or R CT 5031 it should be attached to.



Note: If you are not yet logged in as a user a window will pop up, type in your user login and password then.



The Network Connection Management tool detects all R CT 5021 in a connected network, independent from the IP address in the R CT 5021. If a R CT 5021 has an IP address which is not valid for the connected network it will still be shown in the list of available network component, but an attachment to a LYNX server (R CT 5031 or PC running the LYNX Control SW) in the network is not possible. In this case you have to change the IP address to a valid one for the connected network (see below: Network Configuration Management)

Controller Network Configuration (Network Component Configuration)

In the Network Connection Management window the configuration for the selected controller (Network Component) can be modified, e.g. change of IP address, activation of DHCP mode or changing passwords.

Note: Changing the settings is only allowed for the administrator (Default login: admin, default password: lynx\$admin)

The screenshot shows the 'LYNX Connection Management' window with the 'Network Component Configuration' tab selected. The window contains a table with the following data:

Product	Version	Serial Number	IP Address	MAC Address
RCT5021	393.03.00	N/A	192.168.1.162	00:0b:3c:07:22:ec

Below the table, there is a checkbox labeled 'Auto-locate selected device' which is checked. Under 'Selected Device', the following information is displayed:

- LYNX Product: RCT5021
- Type Code: c2.01
- Serial Number: N/A
- Version: 393.03.00
- MAC Address: 00:0b:3c:07:22:ec

Below this, there is a section for 'Dynamic IP (DHCP)' with a checkbox that is unchecked. The following fields are visible:

- IP Address: 192.168.1.162
- IP Netmask: 255.255.255.0
- IP Gateway: 192.168.1.1

At the bottom of the configuration section, there are buttons for 'Discard', 'Apply...', and 'Set Passwords...'. A 'Close' button is located at the bottom right of the window.

Setting IP Addresses

To set a dedicated IP address for the R CT 5021 just type in the required information into the respective text fields in the Network Connection Management window shown above.

Note: DHCP mode has to be deactivated in the checkbox "Dyanamic IP (DHCP)"

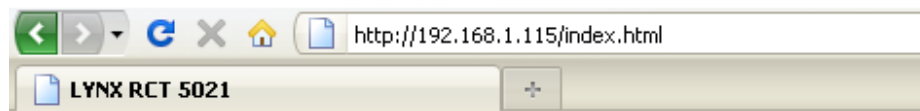
Activation of DHCP Mode

If the controller is installed in a network environment where the IP addresses are allocated automatically (DHCP) the R CT 5021 can be set to DHCP mode. Simply activate the checkbox "Dyanamic IP (DHCP)" in the Network Connection Management window shown above.

Note: IF in DHCP mode the controller will wait approx. 30sec for a DHCP capable server to get allocation of an IP address. If no address will be allocated a default address (169.x.x.x) will be used

Ethernet Web Admin Interface

When the RCT 5021 is in Ethernet mode (DIP switch 5 in ON position) the R CT 5021 can be accessed through a Web Browser for administrative purposes. Through that Web Interface you will see the following page.
If logged in as Administrator (default login: admin, default password: lynx\$admin) basic settings (DHCP mode, IP address) can be modified.
Users without admin rights can only view the available data.



RCT 5021 configuration

Administrator:

[Logout](#)

Set administrator password:

Set control password:

Serialnumber: 333

Software Version: 393

MAC: 00:0b:3c:07:23:a9

DHCP: ☒

IP:

Subnetmask:

Gateway:

[Apply](#)

[Reset fields](#)

Active connections:

- 1) 192.168.1.91:1210
- 2) 192.168.1.227:1024

Ethernet Admin Console

When the RCT 5021 is in Ethernet mode (DIP switch 5 in ON position) the USB front service connector can be used as an Ethernet Admin Console. DIP Switch 8 has to be in ON position then.

This is designed for local connection of a PC running the LYNX control system software for basic setup in case the controller cannot be accessed through the LYNX control SW or the Ethernet Web Admin Interface.

This connection can be used while the main control software is running on the Ethernet 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 4.8.2 or higher of the LYNX Desktop Controller. The connection will be shown as a new, additional COM Port in the LYNX Connection Management Window. The port number itself is variable.*

This connection can be activated as a low level terminal interface.

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\lc3_local or C:\Program Files\Lynx\lc3_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
version	Display version of LYNX Device Controller
help	Show this information

LYNX Desktop Controller Software

The LYNX Desktop Controller software is supplied as part of the R CT 5021 controller package. This is supplied on CD Rom or can be downloaded from the LYNX homepage (please contact your local distributor).

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

PC

IBM compatible PC, Pentium 4 class, 256MB ram VGA Monitor, CD Rom drive with unused serial port.

Operating System:

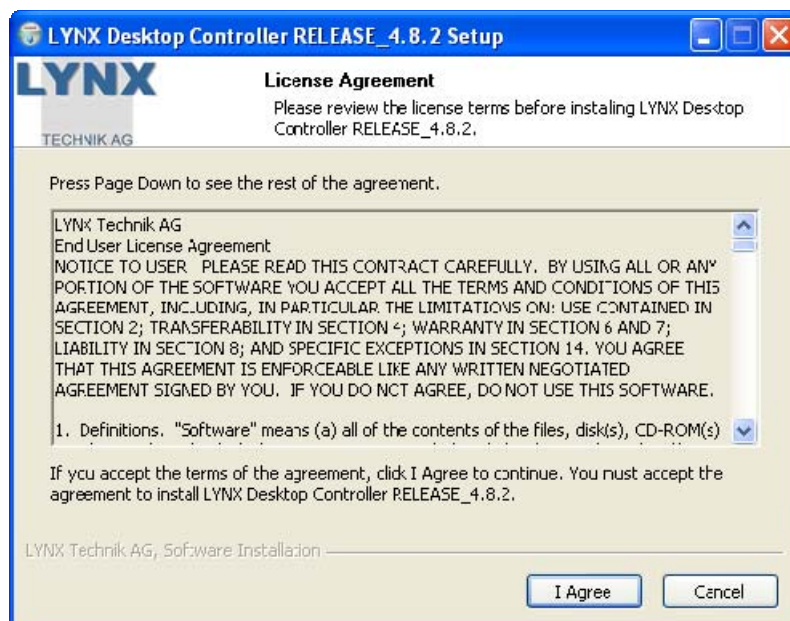
Microsoft Windows XP Home/Professional, Windows 2000.

Software Installation

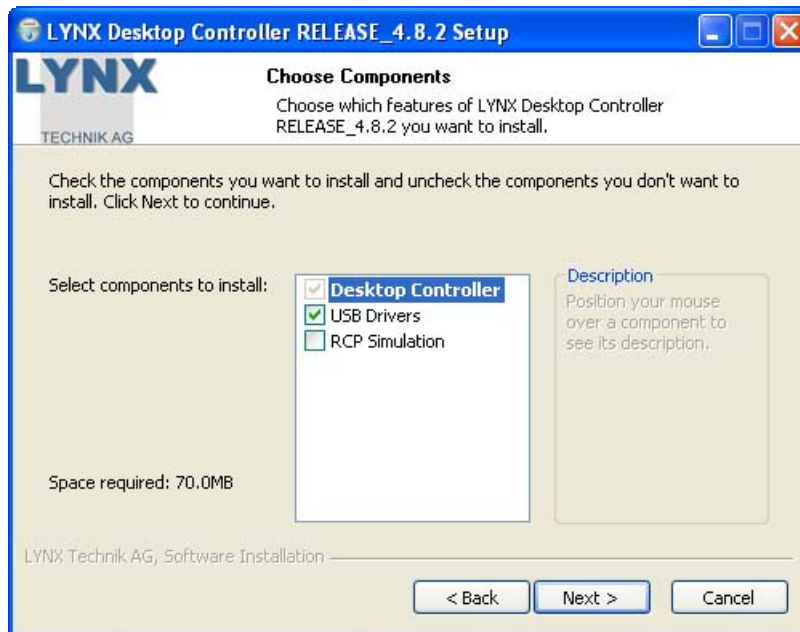
1. Close all other applications on the PC.

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

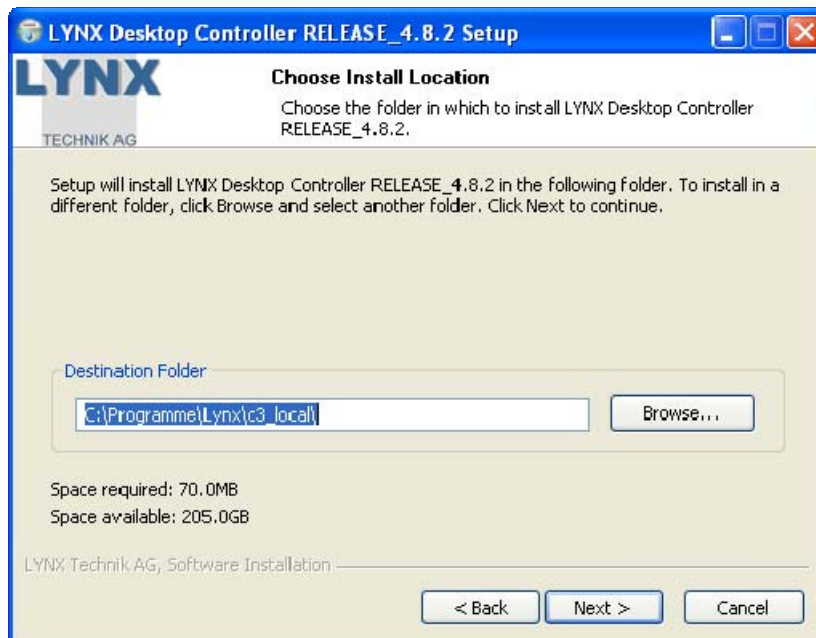
2. The following screen will display, read the license agreement and click **I Agree** if acceptable.



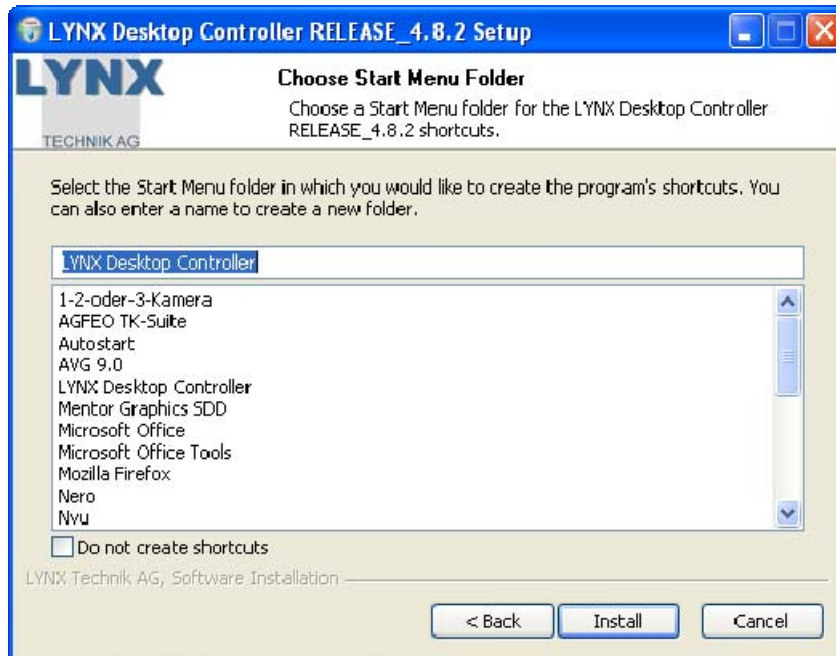
3. Select the additional components and click **Next**



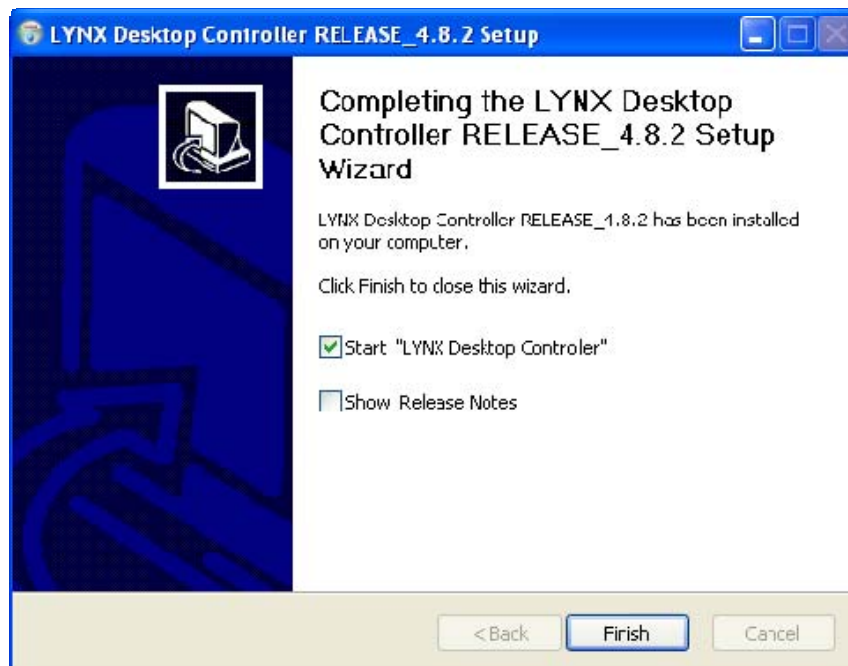
4. Define the destination folder and press **Next** to install the application. You can use the proposed standard folder, which will be created automatically.



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



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



Starting the Controller Application

If you chose to install the desktop icon during installation, simply click this 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 the attached controller, when found the controller will report all the attached modules into the GUI and these will be displayed in the folder tree. Module detection is automatic.

If a connected R CT 5021 is not displayed in the GUI then the software cannot find the Controller. Please check the following:

1. Check the cable is connected to the appropriate PC COM port and the **CONTROL** port on the rear termination panel.
2. Check the controller is configured for RS 232 communications (refer to switch settings)
3. See if there is activity on LED 4 on the controller PCB (this should illuminate if the CONTROL port is active).

If the problem persists you should check the wiring of the RS 232 cable. (RX and TX are not reversed in some cables)

Software Updates

From time to time we update the software to add support for new modules or new features or correct bugs. 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 software installed on your system. Pressing **F1** or selecting the **Help** drop down menu and then **About** will display the splash screen.



Reporting Problems

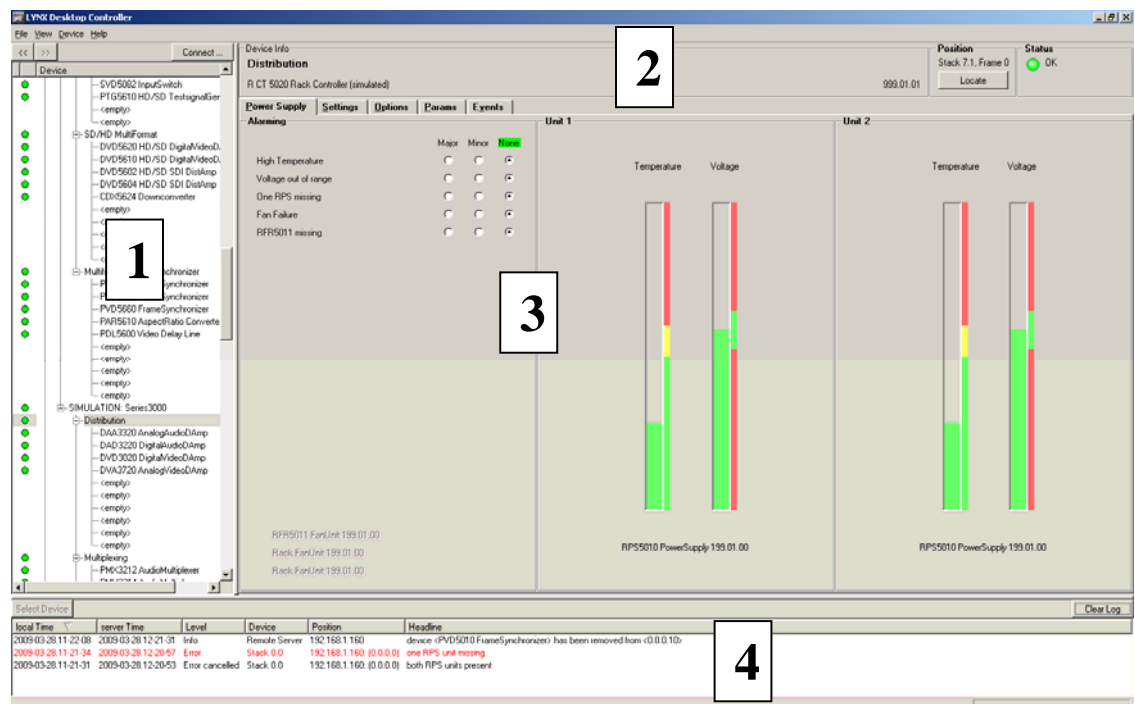
If you are experiencing problems with your installation please contact us for assistance. We will require a copy of a log file that is maintained by the system that can be found in the **C:\Program files\Lynx\C3_local** directory. The file is called **c3_local.logfile.txt**. We will ask you to E-Mail this file with a brief description of the problem and also any steps we can use to duplicate the fault. Send messages to :

[support @ lynx-technik.com](mailto:support@lynx-technik.com)

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 5021.

Control System Layout

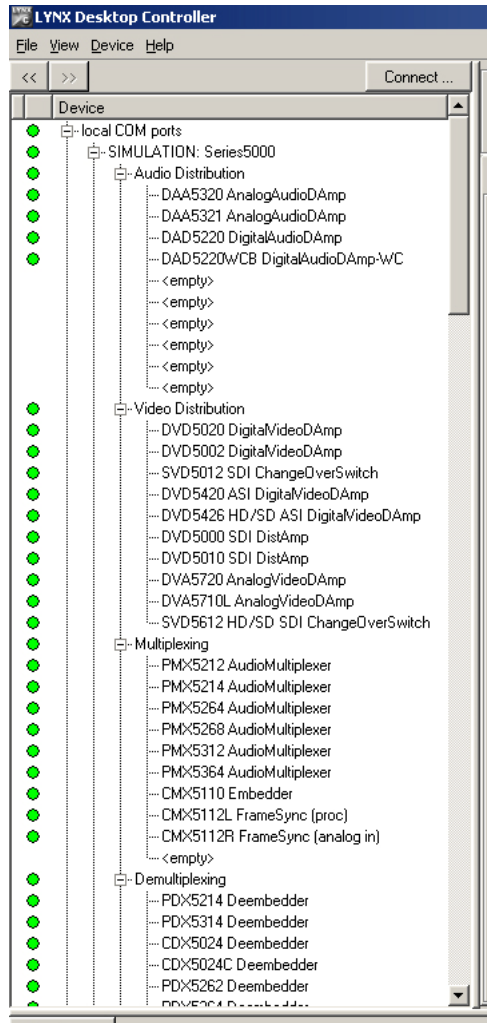


The above screenshot shows the normal layout of the control system GUI. The descriptions below provide more detail on each section of the GUI and its operation.

Device List

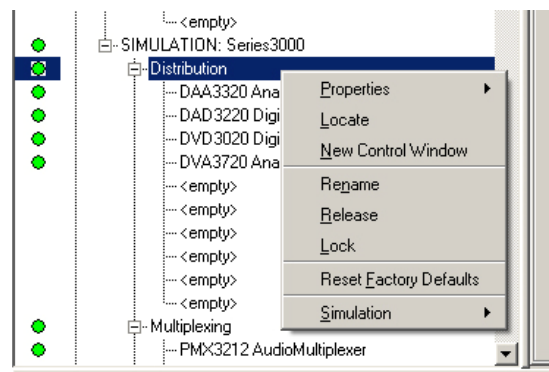
1

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.



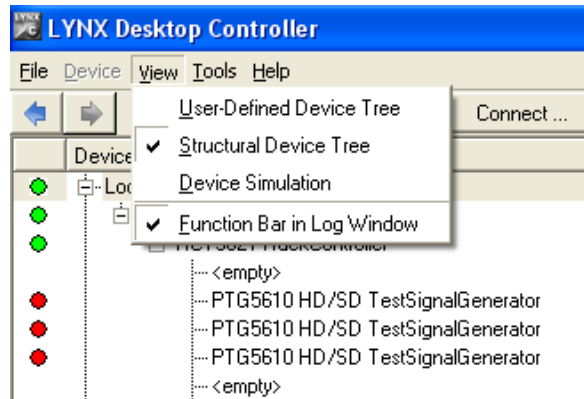
- Clicking on any device in the folder tree will display the associated GUI for control of this device. Next to each device there is a small colored dot. This is a graphic representation of the Alarm LED next to each module listed for easy identification of problems within the system.
- Levels can be 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 error 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.



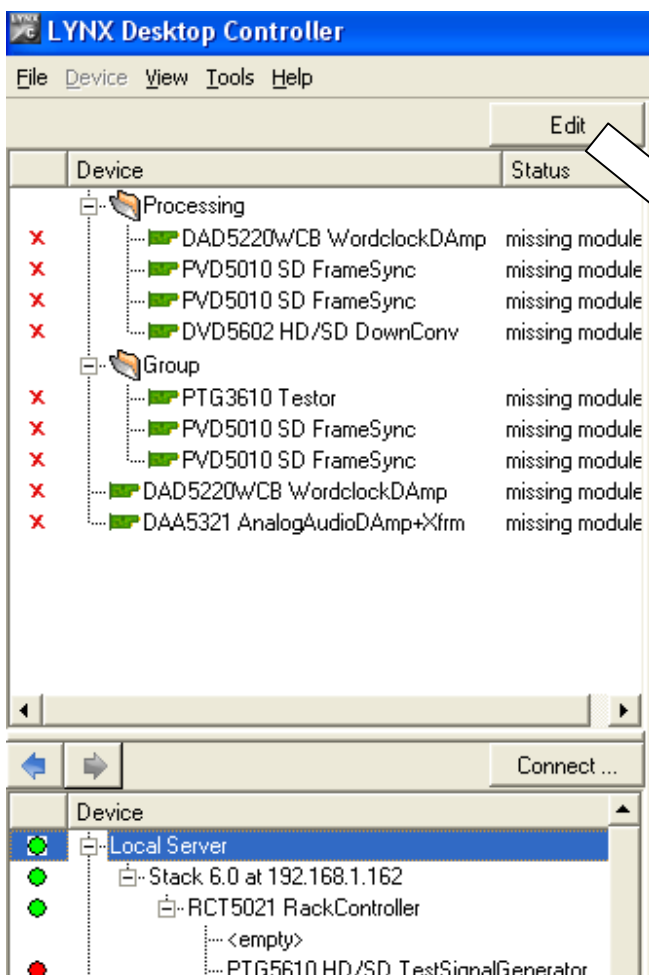
User Defined Device List

A user defined device can be created by each user.

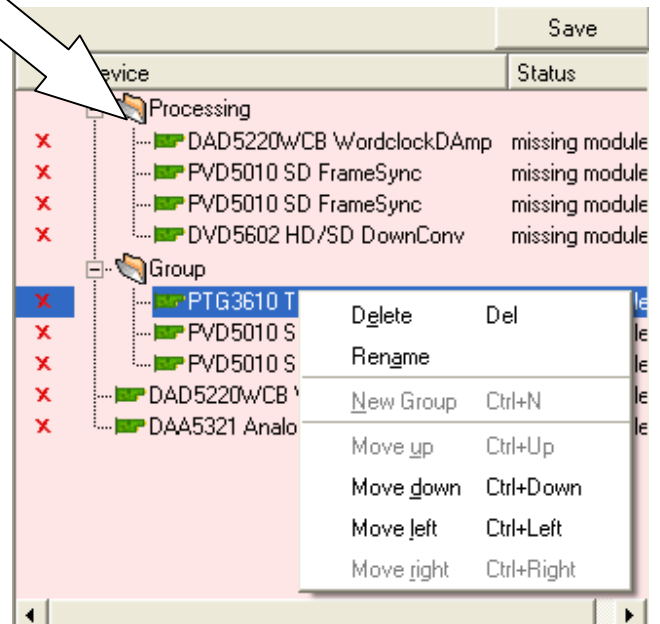


Select the User Defined Device list in the TAB "View".

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

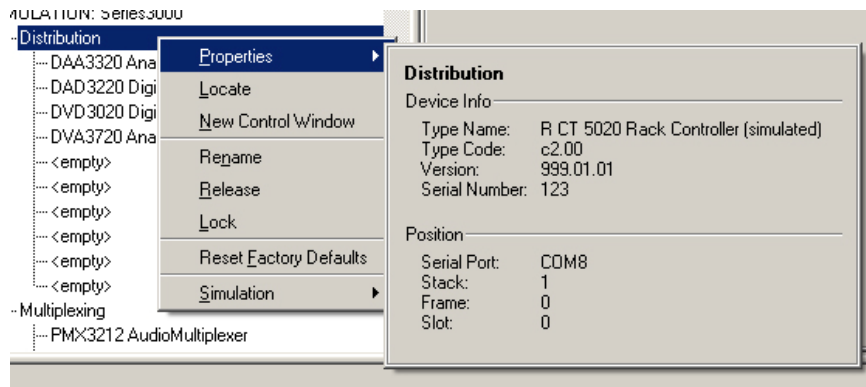


Select "Edit" mode, then you can drag&drop devices from the standard device list to the user defined device list, create own groups etc.



Module Properties

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



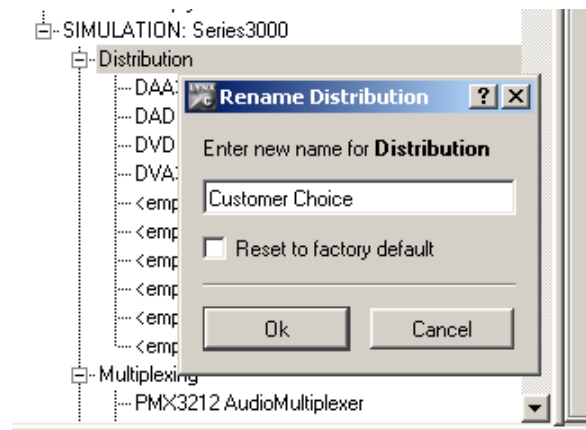
- The **Locate** function is described below

New Control Window

- **New Control Window** opens another window for control of the selected module. With this function several control windows can be opened simultaneously showing various control tabs.

Module Rename

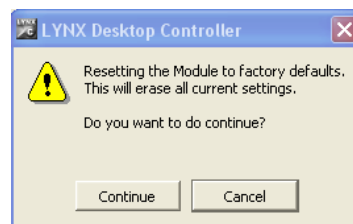
- **Rename** allows to change any module name with a user defined description



- **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

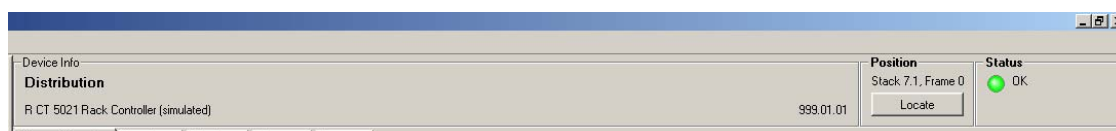
- To avoid any unwanted changes of settings all controls of the selected card can be **Locked**. All control elements of this card will be greyed out then.
- If at any time it is necessary to return the module to the factory default settings this can be done using the “**Restore Factory Default**” function. 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 as well as details on its physical location in the system (Rack number and Rack Slot)



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 ...

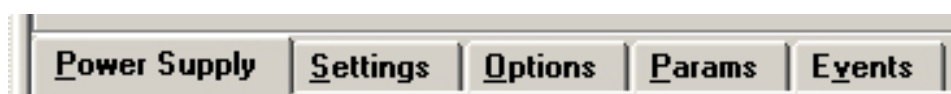
The LED continues to flash in this way until the function is turned off in the GUI.

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.



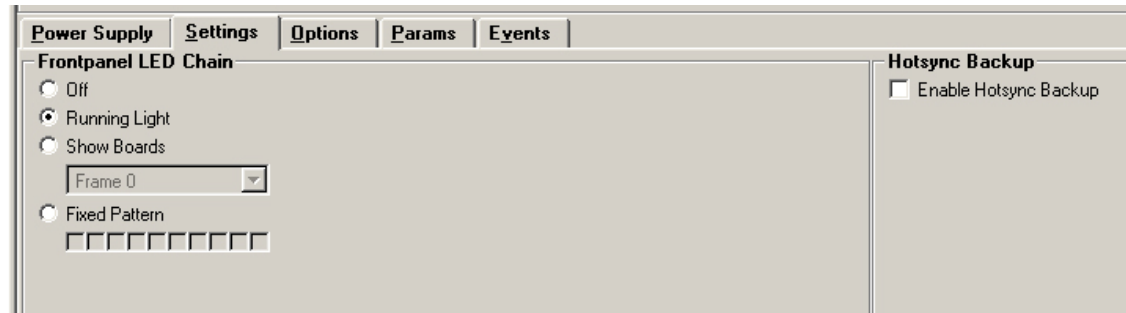
- It shows the status of the power supply voltage as well as the rack temperature
- It shows the status of the power supply voltage as well as the rack temperature

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

Alarming			
	Major	Minor	None
High Temperature	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Voltage out of range	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
One RPS missing	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Fan Failure	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
RFR5011 missing	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

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 5021 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.

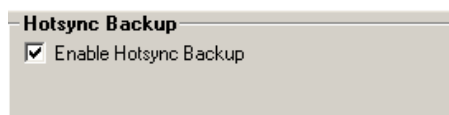
Once enabled Hotsync will remember all the settings and configurations for all modules installed in a Series 5000 Rack. This way when a defective module is “hot swapped” the settings that were previously used are written into the new module. No switches to set, nothing to calibrate, plug and play convenience.

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 5021 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 5021 controller and will need to be enabled for each controller of this type used in your system. The RCT 5021 automatically supports any racks with R CT 5010 bus expanders that are connected to a host RCT 5021 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 function correctly.

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

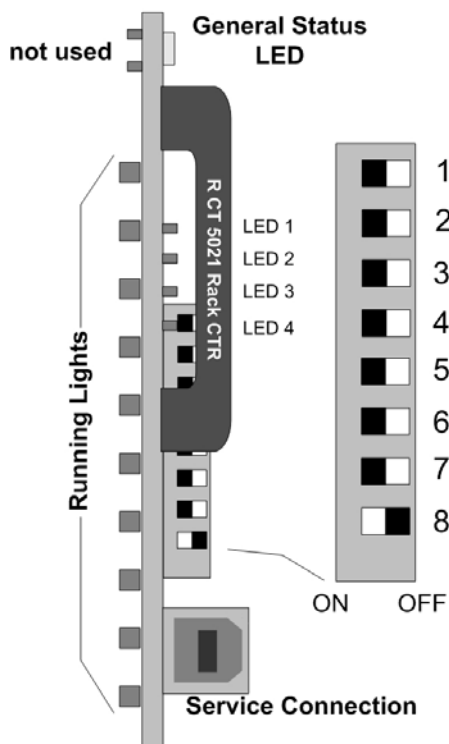
There are times when additional modules, or a new rack with an R CT 5010 expander added to a system during system expansion. Hotsync will detect any additions and automatically register the new hardware and store the settings – no user intervention is required.

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 5021 Controller card that indicate status.

PCB Front View



Hotsync ON – LED 1

This LED is illuminated when Hotsync is switched ON.

1 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.

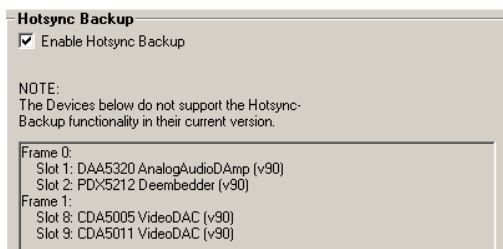
Note

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 5021 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.

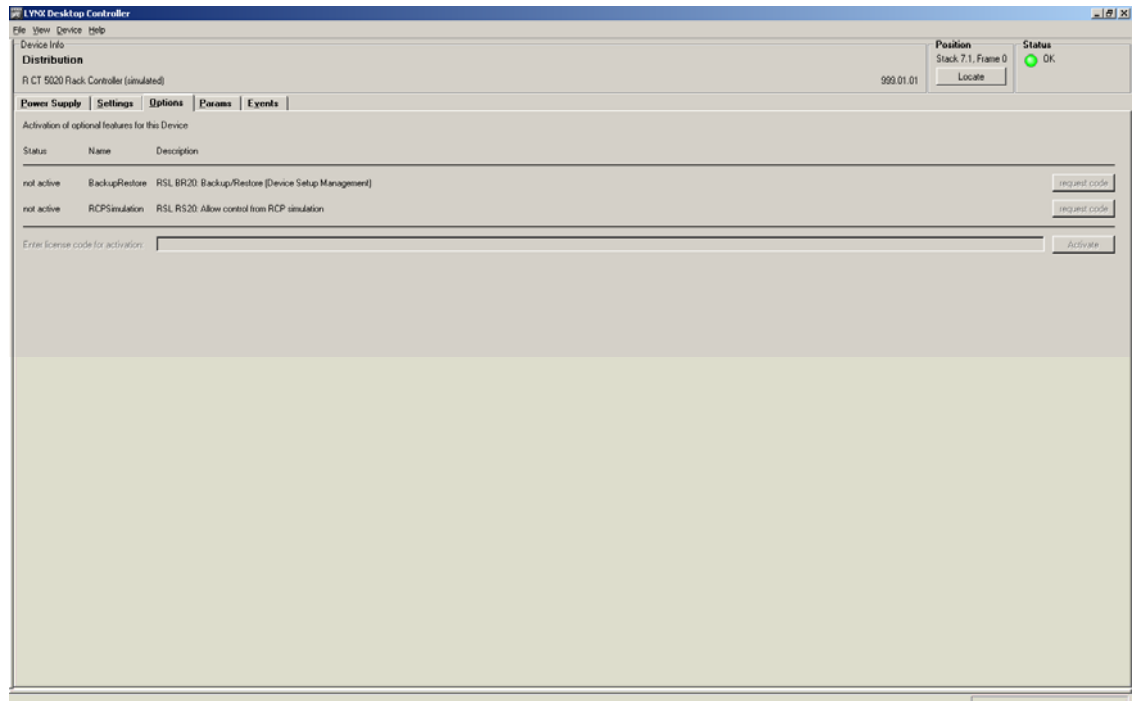
Some older Series 5000 cards will not **support the new Hotsync feature. Modules that are not supported are identified in the GUI when the Hotsync function is enabled.**



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.

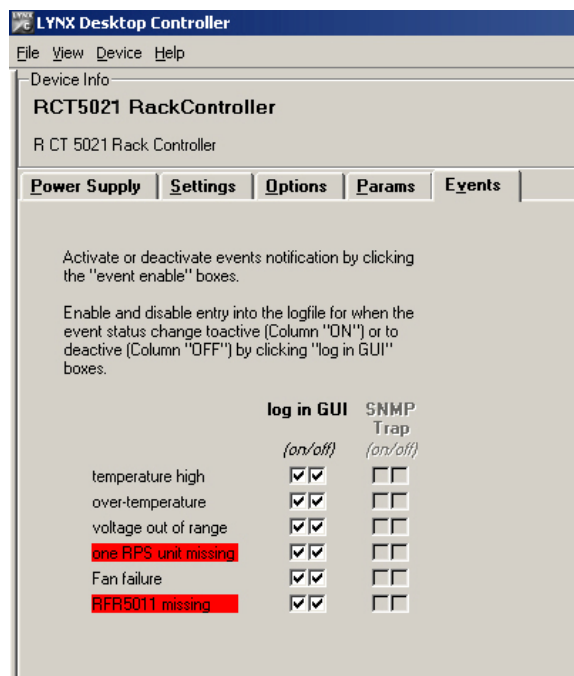
Click the “request code” button next to the channel you wish to activate. A number will be displayed, Please forward this number with your purchase order to your authorized LYNX dealer or representative. When you receive the license string simply type it (or paste it using the windows clipboard) into 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 (see below: Error Logging Area), 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 5030 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.

Error 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 PC 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.

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 there 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.

