RDM 2.0

Technical documentation

"Remote Display Module"

Part number:
A53 Y0 9 0020

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NOTE

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Apply all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

Motors, turbines and any other type of generator must be equipped with protections (overspeed, high temperature, low pressure…) depending on the power plant).

Any changes of the normal use of the equipment can cause human and material damage.

For further information, please contact your CRE technology distributor or the After-Sales Service Team.

All CRE Technology products are delivered with one year warranty, and if necessary we will be happy to come on site for product commissioning or troubleshooting. The company also provide specific trainings on our products and softwares.

Technical support: +33 (0)4 92 38 86 86 (office hours: 8.30AM-12AM / 2PM-6PM GMT+1).
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INFORMATION

You can download the most up-to-date version of this documentation and different other documentations relating to CRE technology products on our Web sitehttp://www.cretechnology.com.

NOTE FOR GENSYS 2.0 LT

This logo indicates that the function described in the chapter is not available in GENSYS 2.0 LT modules.
The main features unavailable in GENSYS 2.0 LT are the support of custom equations and CANopen extension I/O. If you ever need one of these features, please use a standard GENSYS 2.0 module.

Technical documentation history

Date	Version	Comments
Oct. 2012	A	 Initial revision. Firmware is v4.04 to match GENSYS 2.0 software version.

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1 OVERVIEW

1.1 EUROPEAN UNION DIRECTIVE COMPLIANCE CE

The EMC Directive (89/336/EEC) deals with electromagnetic emissions and immunity. This product is tested by applying the standards, in whole or in part, which are documented in technical construction file CEM 2004/108/EC, which replaces directive CEM (89/336/EEC) relative to electromagnetic emissions as from July 20th 2009.

This product is developed to respect harmonized norms:

- EN 55099:2009
- EN 55099:2010
- EN 55088:2008
- 2006/95/EC (replaced directive 73/23/EEC since January 16th 2007).

Other standards:

- EN 61326-1: 2006 (Industrial location)
- EN 55011
- EN 61000-3-2
- EN 61000-3-3

Note: This is an A class product. In a domestic environment this product may cause radio interference. The user is responsible for taking the necessary precautions.

1.2 ENVIRONMENT

Temperature

Operating: 0…+55°C

Storage: -30…+70°C

Humidity: 5 to 95%

Altitude 2000m maximum (according to EN 61010-1 standard)

Tropic proof circuits for normal operation in humid conditions.

Front panel: IP65 protection.

Back panel: IP20 protection.

1.3 MECHANICAL CHARACTERISTICS

Size: 248x197x57mm (9.76x7.76x2.24in)

Weight: 1.9kg (4.2oz)

Panel cut-out:

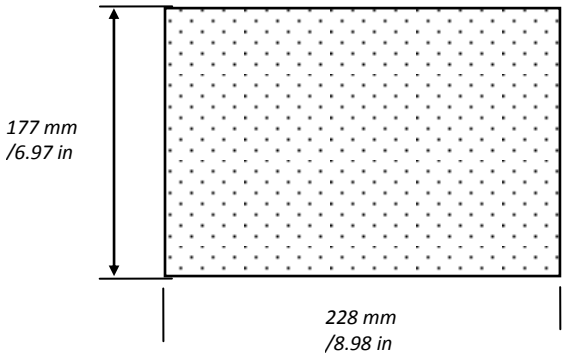

FIGURE 1 - PANEL CUT-OUT

Note: Cut-out must be cleaned and de-burred before mounting.

1.4 APPLICATION

The RDM 2.0 is a remote interface module that can be used with one GENSYS 2.0/GENSYS 2.0 CORE/GENSYS 2.0 LT/MASTER 2.0 module. The RDM 2.0 allows you to display, configure and control the connected module.

The GENSYS 2.0/GENSYS 2.0 CORE/GENSYS 2.0 LT/MASTER 2.0 can control a single or a multiple generating sets power plant.

NOTE

RDM 2.0 must be connected to a control unit (GENSYS 2.0/ GENSYS 2.0 CORE/ GENSYS 2.0 LT/MASTER 2.0) which firmware is at least v4.04. Previous firmware versions are not compatible with RDM 2.0 module.

Multi-control HMI:

A single RDM 2.0 can control up to 16 modules.

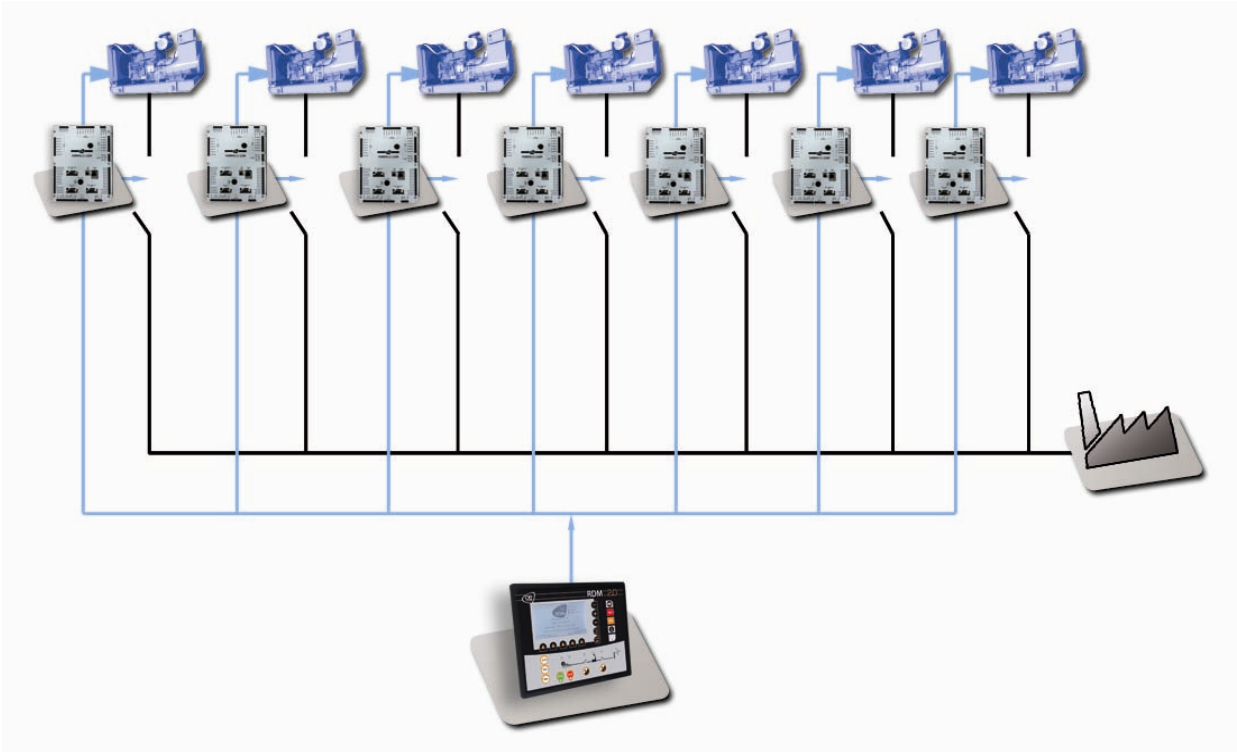

FIGURE 2 - MULTI-CONTROL HMI

2 DESCRIPTION

2.1 FRONT PANEL

Please refer to the A53 Z0 9 0020 X En Technical documentation.

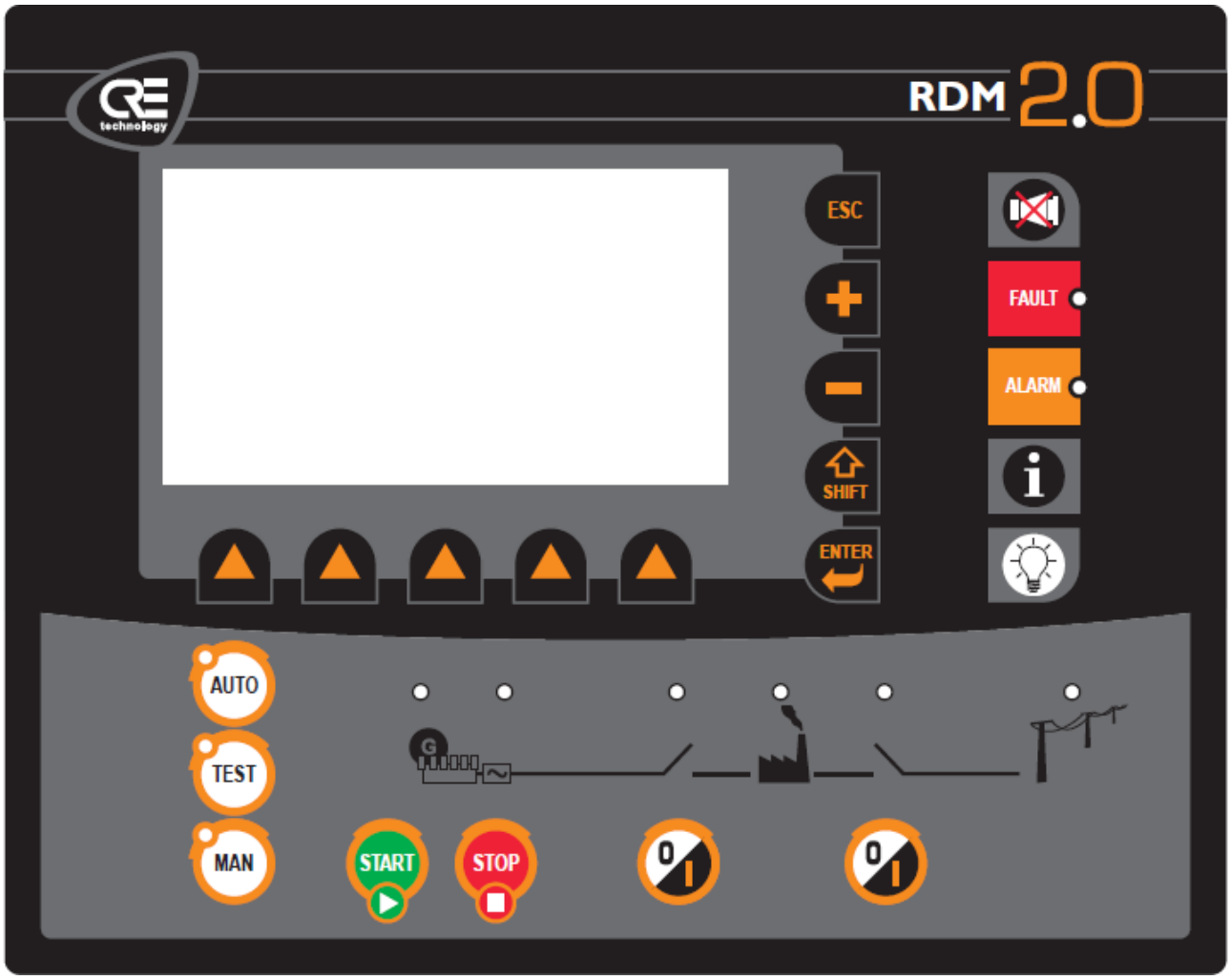

FIGURE 3 - USER INTERFACE

2.2 REAR PANEL - CONNECTORS

2.2.1 OVERVIEW

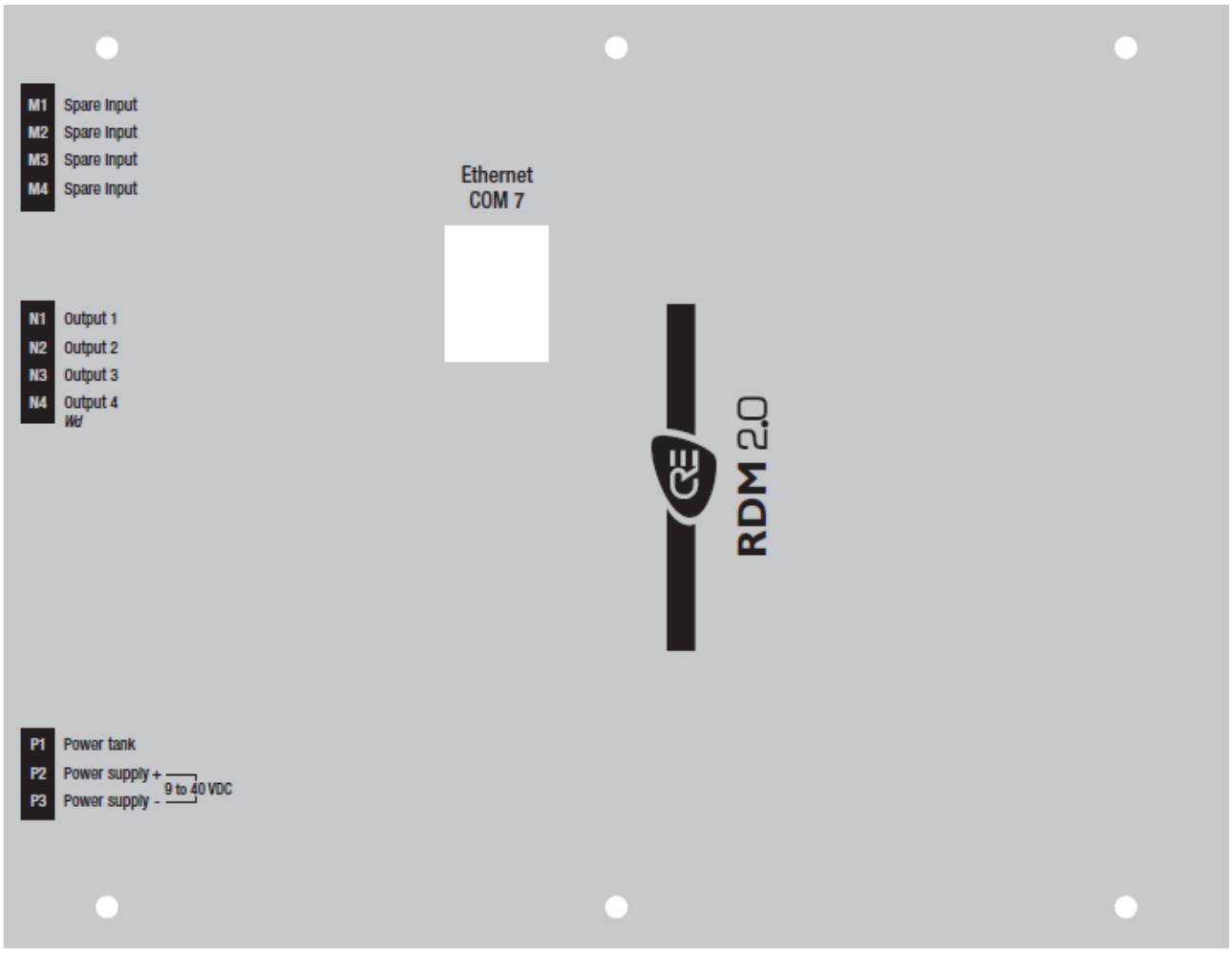

FIGURE 4 - REAR PANEL

2.2.2 INPUTS/OUTPUTS

Terminal	Description	Terminal capacity (mm² / AWG)	Comment
M1 to M4	Spare Inputs	2.5/12	Digital input with 10kΩ pull-up. Each input can be configured with a predefined function. Not isolated. See details in §7.2.1.
N1 to N4	Spare outputs	2.5/12	Transistor output linked to the power supply voltage (<350mA per output). Over current protected. Each output can be configured with a predefined function, see details in §7.2.2.
P1	Power tank	2.5/12	Only used for **12V power supply** backup during crank time. An externally supplied capacitor can be connected between terminal P1 (+) and P3 (-) for better tolerance to power drops. A 47.000µF capacitor can help accept a 200ms power drop.
P2	Power Supply +	2.5/12	9 to 40V, 5W consumption. Protected against polarity inversion. External 5A / 40V_{DC} fuse recommended.
P3	Power Supply -	2.5/12	
COM7	Ethernet	RJ45 CAT5	Standard isolated RJ45 ETHERNET connector. Use a 100Ω cable. During initialization step, the maximum flow rate between RDM 2.0 and connected module is 15kB/s. During normal operation, the average flow rate between RDM 2.0 and connected module is about 5kB/s. Uses TCP/IP and UDP protocols to communicate with other module and/or with external world. See §7.3.4 to configure your Ethernet communication.

TABLE 1 -INPUTS/ OUTPUTS DESCRIPTION

3 USER INTERFACE

The user interface can be controlled using different ways:

- Directly on local browser using front panel LCD screen and keyboard,
- Remotely using your favourite Internet Web browser.

The RDM 2.0 user interface is divided in 2 main parts:

- The specific RDM 2.0 interface,
- The remote interface of the connected module.

Note:

We will describe only the specific RDM 2.0 interface in this documentation as well as some limitations of the RDM 2.0 compared to the connected module (See §7.6).

Please refer to the A53 Z0 9 0020 X En Technical documentation to get information about the connected module interface.

4 INSTALLING AND COMMISSIONING AN RDM 2.0 APPLICATION

NOTE

RDM 2.0 must be connected to a control unit (GENSYS 2.0/ GENSYS 2.0 CORE/ GENSYS 2.0LT) which firmware is at least v4.04. Previous firmware versions are not compatible with RDM 2.0 module.

4.1 DIRECT CONNECTION WITH ONE GENSYS 2.0 CORE

In this application, one RDM 2.0 is directly connected to one GENSYS 2.0 CORE.

- First check the name of the GENSYS 2.0 CORE you want to access. The name of the GENSYS 2.0 CORE is the serial number (xxxxAxxx) followed by the GENSYS 2.0 CORE product reference (A53Z1).

  Ex: 3011A015A53Z1 for a GENSYS 2.0 CORE with serial number 3011A015.
- Go to the menu “RDM 2.0/Configuration/Remote module address” and select “Enter GENSYS 2.0 name” mode.
- Press the right arrow button [>>] and enter the GENSYS 2.0 CORE name.
- Press [shift]+[I] buttons in order to save your RDM 2.0 configuration. (See §5.1.1)
- Connect your RDM 2.0 with a shielded crossover Ethernet cable directly to the COM 4 of your GENSYS 2.0 CORE.
- An initialization menu appears (§7.5), you have to wait about 2 minutes until the end of the initialization.
- You have now access to the GENSYS 2.0 CORE menu from the RDM 2.0.

Note: In this application, the IP address of the RDM 2.0 and the GENSYS 2.0 CORE are those of the factory setting.

4.2 CONNECTION WITH SEVERAL GENSYS 2.0 CORE

In this application, the RDM 2.0 could control up to 16 GENSYS 2.0 CORE. We consider that all modules are using a DHCP server to get their own IP address.

Note: please refer to GENSYS 2.0 documentation to configure the GENSYS 2.0 CORE in DHCP mode.

- Note down all the GENSYS 2.0 CORE names. The name of a GENSYS 2.0 CORE is the serial number (xxxxAxxx) followed by the GENSYS 2.0 CORE reference (A53Z1).

  Ex: 3011A015A53Z1
- Go to the menu “RDM 2.0/Configuration/Remote module address” and select the mode “Input selector”.
- Press the right arrow button [>>] and enter all GENSYS 2.0 CORE names.

  To connect the RDM 2.0 to 5 GENSYS 2.0 CORE, you need to use the 5 first 5 lines of names.

- Go to the menu “RDM 2.0/Configuration/Inputs” and select the “GENSYS 2.0 select” function.

  The number of inputs used depends on the number of connected module. For 5 modules, we have to use the first 3 inputs (See §5.1.3 for more details).

- Press [shift]+[I] buttons in order to save your RDM 2.0 configuration. (See §5.1.1)
- Connect your RDM 2.0 with a shielded Ethernet cable (straight or crossover cable according to your switch) to your local network.
- An initialization menu appears (§7.5), you have to wait about 2 minutes until the end of the initialization.
- According to the input value, the RDM 2.0 will be connected to the right GENSYS 2.0 CORE.

Note: All GENSYS 2.0 CORE must have the same UDP port that the RDM 2.0 could connect on all modules.

5 SPECIAL FUNCTIONS

5.1.1 SAVING ACTUAL CONFIGURATION

In RDM 2.0, parameters used in configuration are stored in a FLASH memory. When a parameter is changed by the user, the new value is stored in a RAM memory. The new value will be effective as soon as it is entered, but it will be lost if power supply is removed. Here is how to permanently save parameters:

Press ***[Shift]*** and ***[I]*** front keys at the same time.

NOTE:
Back-up procedure may take a few seconds. NEVER SHUT DOWN YOUR MODULE DURING STORAGE SEQUENCE (ORANGE LED ILLUMINATED).

5.1.2 FIRMWARE UPGRADE

To upgrade your module firmware, please follow those steps:

- Connect your PC to the module internal Web site using password level 2.
- Go into menu « System/Update software ».
- A safety warning could appear on your screen. Tick the box to allow the application to run and click on “Execute” button.

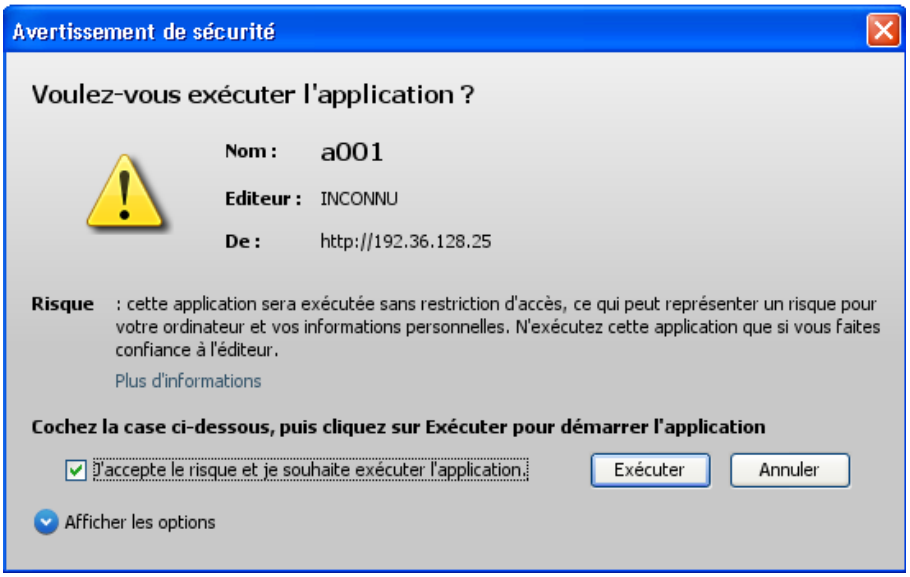

FIGURE 5 - SAFETY WARNING

- Click on « Select file ».
- Select the new ZIP file firmware provided by CRE Technology that you want to program into the module.

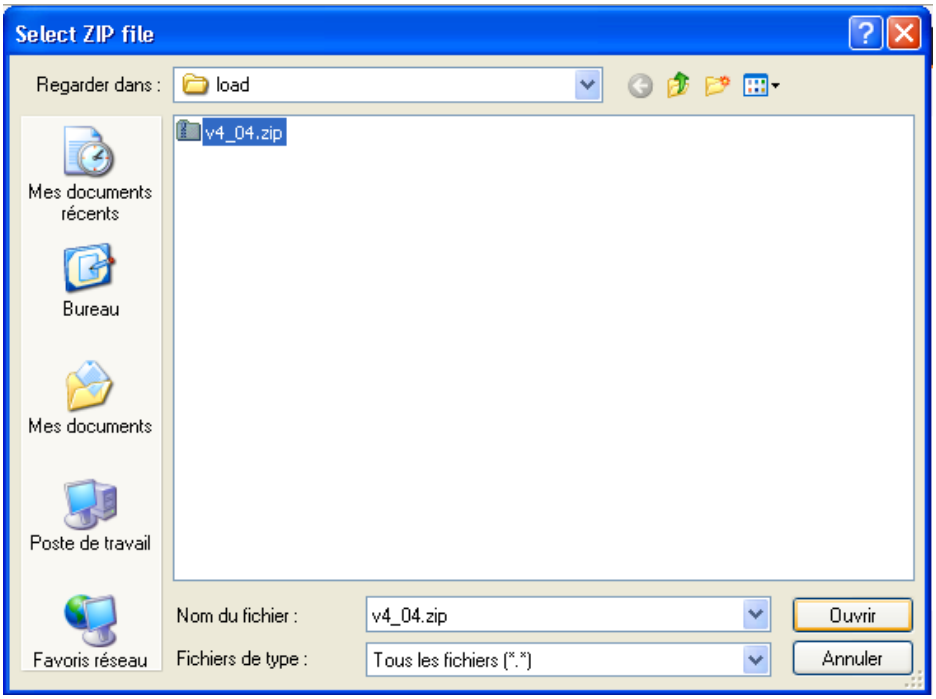

FIGURE 6 - SELECT FIRMWARE

- Click on « Update ».

2 bar graphs indicate the progress of the update. Update can take about 2mn. Don't cut power supply while updating.

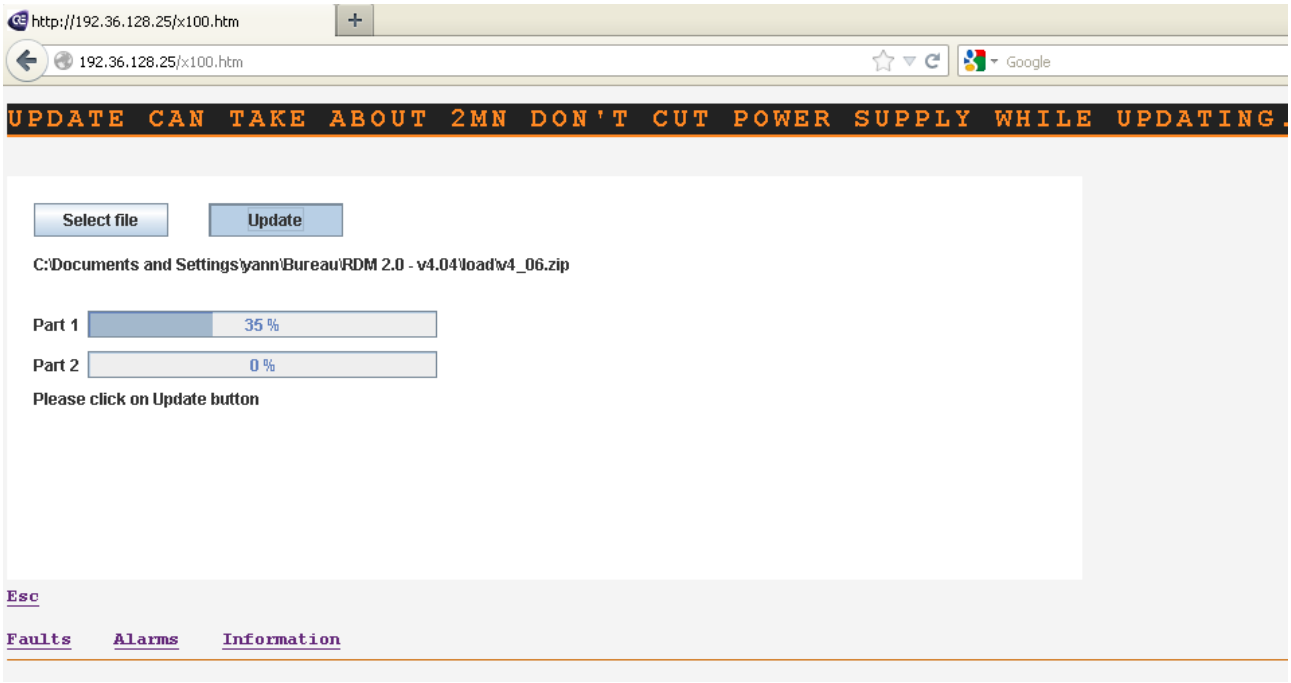

FIGURE 7 - FIRMWARE UPDATE

Note:

Programming a new firmware in your module will erase its actual setup (RDM 2.0 parameters) and replace it by the factory setup of the new firmware. Backup your actual setup if you want to keep it for future usage.

5.1.3 INPUT SELECT FUNCTION

RDM 2.0 can be setup to connect to different units. The unit to which the RDM 2.0 will connect can then be selected using RDM 2.0 spare inputs. To use this function, the select mode must set to “Input selector” in the “***remote module address***” menu and the name of the modules must be configured (See §7.3.1)

Then digital inputs must be configured as “GENSYS 2.0 select”. The number of inputs used depends on the number of connected modules. For example, if 5 modules must be connected at least 3 inputs are necessary. Table below describes the selected module according to the value of the inputs.

Input 1	Input 2	Input 3	Input 4	Selected module
0	0	0	0	GENSYS 2.0 #01
1	0	0	0	GENSYS 2.0 #02
0	1	0	0	GENSYS 2.0 #03
1	1	0	0	GENSYS 2.0 #04
0	0	1	0	GENSYS 2.0 #05
1	0	1	0	GENSYS 2.0 #06
0	1	1	0	GENSYS 2.0 #07
1	1	1	0	GENSYS 2.0 #08
0	0	0	1	GENSYS 2.0 #09
1	0	0	1	GENSYS 2.0 #10
0	1	0	1	GENSYS 2.0 #11
1	1	0	1	GENSYS 2.0 #12
0	0	1	1	GENSYS 2.0 #13
1	0	1	1	GENSYS 2.0 #14
0	1	1	1	GENSYS 2.0 #15
1	1	1	1	GENSYS 2.0 #16

TABLE 2 - MODULE SELECTED BY INPUT

Inputs not set up as “GENSYS 2.0 select” are considered to be set to 0 for the selection of a module. That is why it is recommended to use the first inputs in priority.

Example:

If you have 4 GENSYS 2.0 CORE for 1 RDM 2.0, it’s easier to use Input 1 & Input 2 than Input 3 & Input 4.
With Input 1 & Input 2, the connected modules will be GENSYS #1, GENSYS #2, GENSYS #3 and GENSYS #4.
With Input 3 & Input 4, the connected modules will be GENSYS #1, GENSYS #5, GENSYS #9 and GENSYS #13 as inputs 1 and 2 are considered to be set to 0.

Note: When switching from one connected module to another, it will take about 30s to initialize the RDM 2.0. A dedicated screen is displayed during initialization (See §7.5)

6 SUPPORT/TROUBLESHOOTING

RDM 2.0 can't connect to the module

- Check the soft version of your module. GENSYS 2.0 CORE module can be connected to a RDM 2.0 from v4.02 version and newer version.
- Check the module name you typed in corresponds to the module you are trying to connect.
- Check you are using a suitable cable according to your application (straight or crossover cable).
- In fixed IP, check the IP address of the RDM 2.0 and the connected module. They must not have the same IP address but they must have the same prefix address of the subnet mask. Example: 192.168.11.1 and 192.168.11.2 will work but not 192.168.**12**.1 and 192.168.**11**.2 because the subnet mask is defined as 255.255.**255**.0. So the first 3 numbers must be the same in both modules.
- Check the UDP port of the RDM 2.0 and the connected module. They must be identical.

It seems there is a poor communication between RDM 2.0 and connected module

- Check you are using a shielded Ethernet cable.
- Check your modules are well connected on earth.

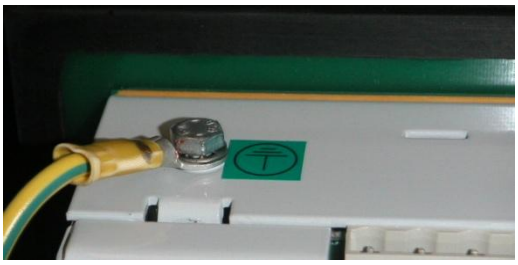

FIGURE 8 - EARTH CONNECTION

- If you are using a hub/switch, check you are using an industrial hub/switch that is correctly connected to the earth and respects the EMC immunity rules.

7 MENU OVERVIEW

7.1 MENU INTRODUCTION

Menu is entered when [ESC] key is pressed, and once password has been verified. The password will define which menu will be accessible on RDM 2.0 and on the remote unit connected.

For the connected module menu, please refer to the documentation of the module.

For the specific RDM 2.0 menu:

Level 0: will give access to display menu only. (Without password, only press Enter/Enter)

Level 1/Level2: will give access to all menus of RDM 2.0. Factory password level 1 is “1”.

3 main menus are available:

Display menu will give information about the RDM 2.0 status. (See §7.2)

Configuration is only accessible if you have entered a level 1 or 2 password. There you will be able to program RDM 2.0 according to your needs. (See §7.3)

System is only accessible if you have entered a level 1 or 2 password. The system menu will display information about RDM 2.0 system. (See §7.4)

7.2 DISPLAY MENU

This menu gives access to the following information:

- Inputs
- Outputs
- Connect status (only in level 0)
- About (only in level 0)

7.2.1 INPUTS

This menu shows the status of 4 digital inputs connected on the “M” terminal.
The name of each input is displayed with the status: Input active =1, Input inactive = 0.

7.2.2 OUTPUTS

This menu shows the status of 4 digital outputs connected on the “N” terminal.
The name of each output is displayed with the status: Output active =1, Output inactive = 0.

7.2.3 CONNECT STATUS

This menu is only display with the level 0 password. It’s the same menu than « System/Connect status » available with the level 1 or 2 passwords (See §7.4.1).

7.2.4 ABOUT

This menu is only displayed with password level 0. It’s the same menu as « System/About » which is available with password level 1 and 2 (See §7.4.2).

7.3 CONFIGURATION MENU

This menu allows you to configure the unit. You can access to this menu with the level 1 or 2 password.

The submenus are the followings:

- Remote module address
- Inputs functions
- Outputs functions
- Ethernet configuration

7.3.1 REMOTE MODULE ADDRESS

On this page, you can select the selection mode of the connected module by enter the name of the connected module

You have access to the submenu to configure the name by pressing the arrow [>>] button.

7.3.2 INPUTS FUNCTIONS

This menu allows you to configure the digital inputs (M1 to M4).

For each digital input, you can select a function among those described in the following table.

ABOUT GENSYS 2.0 LT

GENSYS 2.0 LT does not feature custom PLC equations. So in the case of an RDM 2.0 connected to a GENSYS 2.0 LT module, only function “Inhibit buttons on remote modules” (value 2 in the table below) can be used.

If you need to use another function, connect your RDM 2.0 to a GENSYS 2.0 or GENSYS 2.0 CORE module.

Value	Function	Description
0	Unused	Should be selected if you do not use the input.
2	Inhibit button on other mod	Input is used to inhibit button on connected module (except on GENSYS 2.0 CORE)
1710	User Param 001	Value of input (0 or 1) will be written into variable [E1710] of connected module.
1711	User Param 002	Value of input (0 or 1) will be written into variable [E1711] of connected module.
1712	User Param 003	Value of input (0 or 1) will be written into variable [E1712] of connected module.
1713	User Param 004	Value of input (0 or 1) will be written into variable [E1713] of connected module.
1714	User Param 005	Value of input (0 or 1) will be written into variable [E1714] of connected module.
2283	Virtual Input 01	Value of input (0 or 1) will be written into variable [E2283] of connected module.
2284	Virtual Input 02	Value of input (0 or 1) will be written into variable [E2284] of connected module.

Value	Function	Description
2285	Virtual Input 03	Value of input (0 or 1) will be written into variable [E2285] of connected module.
2286	Virtual Input 04	Value of input (0 or 1) will be written into variable [E2286] of connected module.
2287	Virtual Input 05	Value of input (0 or 1) will be written into variable [E2287] of connected module.
2440	User var. 001	Value of input (0 or 1) will be written into variable [E2440] of connected module.
2441	User var. 002	Value of input (0 or 1) will be written into variable [E2441] of connected module.
2442	User var. 003	Value of input (0 or 1) will be written into variable [E2442] of connected module.
2443	User var. 004	Value of input (0 or 1) will be written into variable [E2443] of connected module.
2444	User var. 005	Value of input (0 or 1) will be written into variable [E2444] of connected module.

TABLE 3 - INPUT FUNCTIONS

7.3.3 OUTPUT FUNCTIONS

This menu allows you to configure digital outputs N1 to N4.

You can select a different function for each digital output. See function list in the documentation of the connected module.

7.3.4 ETHERNET CONFIGURATION

This menu allows you to configure the Ethernet connection to communicate with the connected module or with the PC. Please contact your network administrator to configure router and module(s) according to your need.

Parameter	*Possible value*	*Comment*
Use DHCP	Disable [0] Enable [1]	Enable to use DHCP protocol (dynamic IP address) or disable to set a fixed IP address.
IP Address(1)		Configure fixed IP address of the unit (Used when DHCP is disabled or in fault). Default address: 192.168.11.2.
UDP GENSYS 2.0		UDP communication port of the connected module. Default port: 7024.

TABLE 4 - ETHERNET CONFIGURATION

(1) Available only if the DHCP is disabled.

NOTE

The UDP GENSYS 2.0 parameter of the RDM 2.0 must be identical to the UDP port of the module to connect in order to successfully connect the modules.

A backup of the parameters must be done by pressing [SHIFT]+[I], then switch off the module in order to apply the new Ethernet settings.

7.4 SYSTEM MENU

This menu will give access to the following menus which display system parameters.

- Connect status
- About
- Update firmware (only in level 2 and from computer)

7.4.1 CONNECT STATUS

This menu displays some information on module and connection.

Name	Description
RDM 2.0 name	Name of the RDM 2.0
RDM 2.0 IP	IP address of the RDM 2.0
RDM 2.0 MAC	MAC address of the RDM 2.0
RDM 2.0 DHCP	Indicate if DHCP is disable or enable
GENSYS 2.0	Name of the connected module
GENSYS 2.0 IP	IP address of the connected module
Remote comm.	Status of the remote communication

TABLE 5 - CONNECT STATUS

7.4.2 ABOUT

This menu displays some information on module.

Name	Description
Serial number	Serial number of the RDM 2.0
Soft version	Actual soft version of the RDM2.0

TABLE 6 - ABOUT

7.4.3 UPDATE FIRMWARE

This menu is only available in level 2 and on computer.
It allows you to update the software with the latest version (See §5.1.2 for more details).

7.5 INITIALIZATION SCREEN

The initialization screen is displayed when:

- Power up the module,
- The RDM 2.0 is connecting to a module,
- Pressing the **[I]** button if any module is connected.

This screen contains:

- The module name to which RDM 2.0 is connecting.
- The connection status.

Symbol	Description
NC	Not Connected – RDM 2.0 is trying to connect to module.
INIT	RDM 2.0 is initializing
OK	Connection is done, RDM 2.0 is ready
FAILED	RDM 2.0 initialization has failed. To start a new initialization, you have to : • modify the module name to which RDM 2.0 is connecting, • or to press **[ENTER]** button when initialization screen is displayed.

TABLE 7 - INITIALIZATION SCREEN

- A bar graph indicating the progress status of the initialization. This may take up to 30s.

NOTE

Don't cut power supply or disconnect the Ethernet cable during initialization.

7.6 LIMITATIONS

Some of the features proposed on the connect module cannot be done directly on RDM 2.0. As a consequence, corresponding menus are not available in the RDM 2.0.

These limitations are described below:

- Update connected module's firmware
- Reset factory settings
- Download logo
- PC -> GENSYS 2.0 and GENSYS 2.0 -> PC menu for configuration file transfer.

7.6.1 UPDATE FIRMWARE

It's not possible to be connected on the RDM 2.0 Web site and to update firmware of the connected module.

To update firmware of the connected module, you have to connect directly to this module.

7.6.2 RESET FACTORY SETTINGS

The reset factory settings function is only available from the connected module (Web site or front face).

7.6.3 DOWNLOAD LOGO

It's not possible to download a logo into the connected module. To download a logo into the connected module, you have to connect on the GENSYS 2.0 Web site.

Note: Even if the connected module has a different logo, the RDM 2.0 will keep the CRE Technology logo.

7.6.4 PC -> GENSYS 2.0 AND GENSYS 2.0 -> PC MENU

It's not possible:

- To send a file (ex: equation file) to the GENSYS 2.0 from the RDM 2.0 Web site.
- To receive any file (ex: Alarm/Fault summary, equation file, data logging) from the GENSYS 2.0 by using the RDM 2.0 Web site.

⇨ Connect your Web browser directly to the GENSYS 2.0 Web site.

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SKYPE: support-cretechnology.com

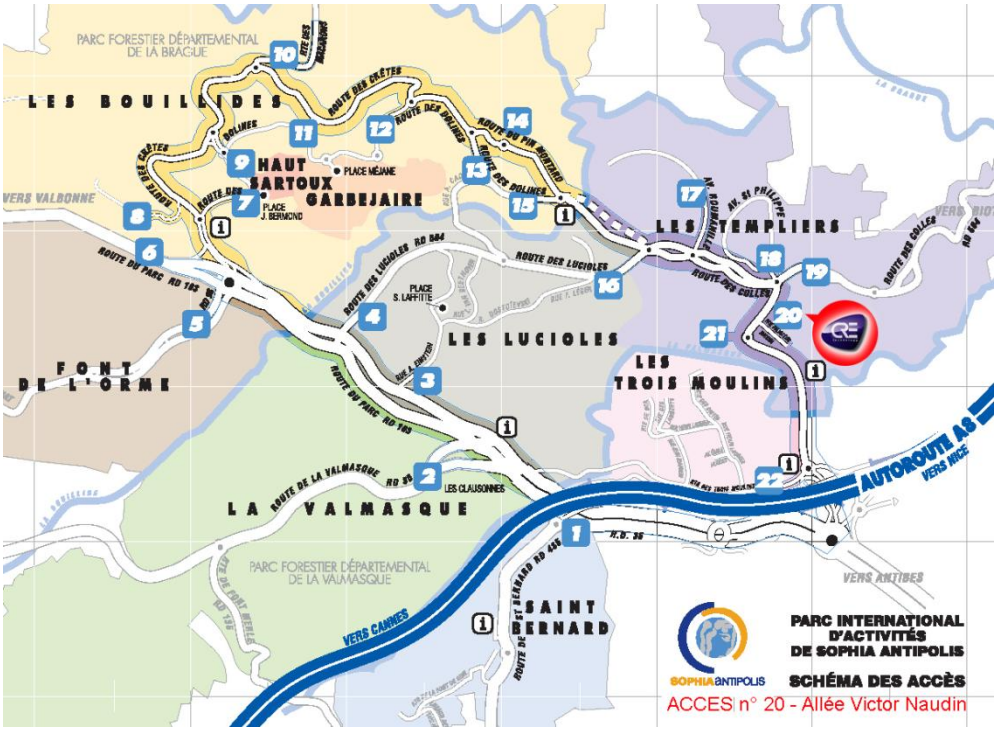

FIGURE 9 - ACCESS TO CRE TECHNOLOGY

Check our entire distributors list around the world on www.cretechnology.com tab “DISTRIBUTORS”

FIGURE 10 - CRE TECHNOLOGY DISTRIBUTORS