

Functional Description and Specifications

Version: 1.0

December 5, 2011

Q1

19"/1RU Chassis with LED Display of the RUBIDIUM SERIES 1 System

Supplement to the "Installation & Systems Manual RUBIDIUM SERIES"



Alpermann+Velte

CONTENTS

A1	REVISION HISTORY	
A2	COPYRIGHT	
A3	GENERAL REMARKS	
1	OVERVIEW	4
2	THE FRAME AND THE FAN	5
2.1	THE 19" CHASSIS	5
2.2	PLUG-IN A RUB1 MODULE	6
2.3	REMOVE A RUB1 MODULE	7
2.4	THE FAN MODULE: FAN, FRAME ADDRESS, TC_LINK TERMINATION	8
3	THE DISPLAY	9
3.1	OVERVIEW	9
3.2	TWO DISPLAYS IN ONE SYSTEM: PRIMARY AND SECONDARY	9
3.3	THE "TC-LINK" INTERFACE TO CONTROL THE DISPLAY	10

Functional Description and Specifications Q1

Page 2

A1 Revision History

No.	Date	Subject
0.n		Preliminary documents, changes without notice.
1.0	December 05, 2011	First released document.

A2 Copyright

Copyright © Alpermann+Velte Electronic Engineering GmbH 2002. All rights reserved. No part of this publication may be reproduced, translated into another language, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written consent of Alpermann+Velte Electronic Engineering GmbH.

Printed in Germany.

Technical changes are reserved.

All brand and product names mentioned herein are used for identification purposes only, and are trademarks or registered trademarks of their respective holders.

Information in this publication replaces all previously published information. Alpermann+Velte Electronic Engineering GmbH assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

For further information please contact your local dealer or:

Alpermann+Velte

Electronic Engineering GmbH

Otto-Hahn-Str. 42

D-42369 Wuppertal

Phone: ++49 - (0)202 - 244 111 0

Fax: ++49 - (0)202 - 244 111 5

E-Mail: info@alpermann-velte.com

Internet: <http://www.alpermann-velte.com>

A3 General Remarks

This manual is a supplement to the "Installation & Systems Manual RUBIDIUM SERIES". Please read the below listed chapters of the "Installation & Systems Manual RUBIDIUM SERIES", as these chapters are necessary for the safe and proper use of this device.

- A3 Warranty,
- A4 Unpacking/Shipping/Repackaging Information,
- A5 Safety Instructions,
- A6 Certifications & Compliances,

Functional Description and Specifications Q1

1 Overview

The **RUB1 Q1** is a rack mount frame in 19"/1RU space with integrated display module.

Chassis

It provides additional capacity for two *Rubidium Series 1* modules. Display module and fan module have been integrated. **PC** and **RLC** connectors are located at the rear.

Display Module

This module is part of the delivery and fits into the appropriate double-wide slot. There is no initial set-up or configuration of this module possible; it is not addressable via any *Rubidium* configuration tool. The serial number is located on the bottom side of the circuit board of this module.

A red LED (OPER) at the front indicates that the module is operating.

The 8-digit display (7-segment LEDs, LED colour red, 15 mm digit height) shows data received from the "TC_link" interface. These data have to be transmitted from any *Rubidium* module located in this chassis or connected via RLC to this chassis.

Fan Module

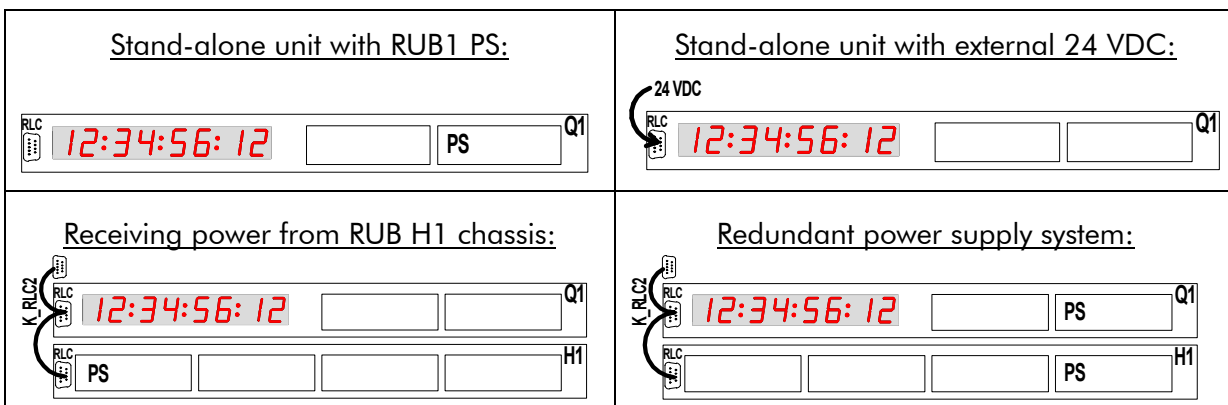
The fan module is located at one side of the frame behind the **PC** connector. This module contains the fan and the fan control electronic, furthermore an USB/RS232 converter, a fail relay for error detection, a fourfold dip switch and a rotary switch to set an address or frame number.

Power Supply

Power supply is **not** an integral part of the chassis.

Using this chassis as a stand-alone unit, a RUB1 power supply module has to be plugged in. Likewise, a suitable external 24 VDC power supply can be connected to the RLC connector.

Using this chassis as part of a system of other RUB1 frames, power can be received via RLC connection. Likewise, a RUB1 power supply module can be plugged in to build a redundant power supply system. Please always use a **K_RLCn** type cable made by *Alpermann-Velte*.

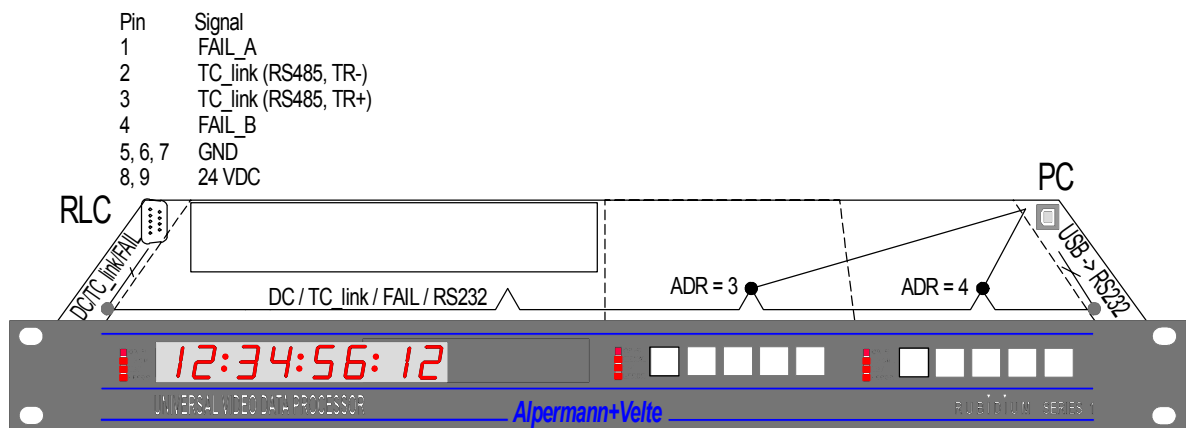


2 The Frame and the Fan

2.1 The 19" Chassis

The **RUB Q1** mount frame was designed to house up to two additional rear loading modules in 1RU space. The connectors for inputs and outputs are a standard part of each module. There is a uniform front for these modules which offers a see-through window for four status LED's and cut-outs for 4 keys and an identification button for each module.

- The two slots are assigned to the hard wired addresses 3 and 4 of the frame. Any configurable module can send data to the display via internal "TC-link" interface. Display and modules receive power via internal connection. The DC operating voltage can be supplied at the RLC connector or by a power supply module plugged into this chassis.
- The **PC** connector enables access to modules at addresses 3 and 4. PC programs for configuration and status monitor are available.
- The **RLC** connector at the rear of the frame combines the "TC_link" interface (which enables communication to modules located in further chassis), the "FAIL" signal used for error detection (a total failure of any module in the frame leads to a contact closure), and the "24 VDC" operating voltage input or output.



The "RUB Q1" frame: connectors RLC and PC, internal signal distribution

Material	High-grade steel, blank
Weight	1 kg approx.
Mounting	Standard 19-inch rack, 1U
Dimensions (without 19" front plate)	446.5 (W) x 44.5 (H) x 176.5 (D, without RLC DSUB) mm 17.58 x 1.75 x 6.95 inch
Power consumption	Max.: 8.5 W (all LEDs with maximum brightness) Typ.: 6.0 W Min.: 3.5 W (all LEDs switched off except the OPER LED)
Maximum power dissipation	Without fan, by free air convection: 20 W With fan [3 cfm]: 34 W
Technical data of the fan	Nominal voltage: DC 12 V \pm 15% Power: 0.84 W Maximum air flow [cfm]: 3

2.2 Plug-In a RUB1 Module

All modules of the *Rubidium Series* can be “hot swapped”. To plug-in a module, please proceed as follows:

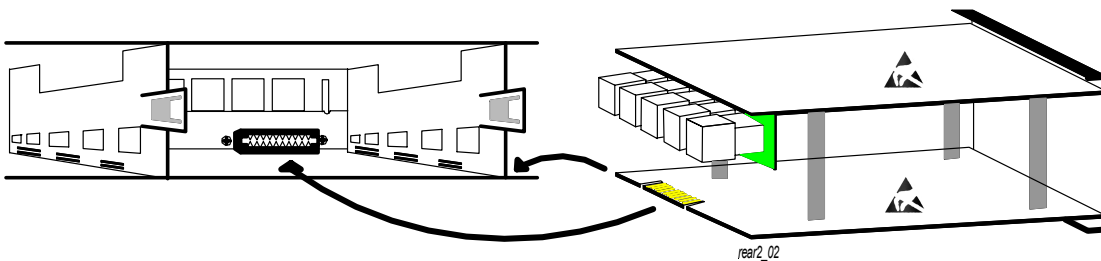
- Remove the solid rear panel cover plate for the slot where the module should be installed: on the right hand side of the slot there is a small protruding tab that needs to be slightly pressed to the right, so that the rear panel cover plate can be easily removed. Retain the cover plate for possible future use.
- Remove the front panel cover plate for the slot where the module should be installed in (it pops off with the use of a small flat screwdriver). This will open the cut-outs for 4 keys and for the module identification button. Retain the cover plate for possible future use.
- Remove the module from its anti-static packing material. Hold the module by the edges or the rear plate; please do not touch the electronic components, strip conductors or pins. Retain the packing material for possible future use.

ATTENTION:



Observe precautions for handling electrostatic-sensitive devices. See “Electro Static Discharge (ESD) Precautions” at chapter A5 of the “Installation & Systems Manual RUBIDIUM SERIES” for details.

- The connector pads of the lower circuit board fit into the socket receptacles inside the slot. Insert the module into the appropriate slot, being careful to fit the lower circuit board into the slotted card guides located on both sides of the slot. With sufficient pressure push the module until it engages into the front socket receptacle.



Insert a module

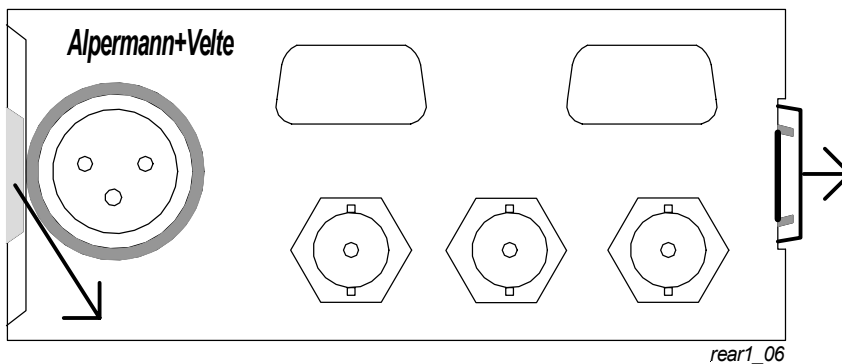
- In order to fasten the module: take care that the rear panel of the module has fully clicked into the frames protruding tab.

2.3 Remove a RUB1 Module

All modules of the *Rubidium Series* can be "hot swapped". There may be occasions when you must exchange a module which has a user defined configuration. If the new module should work with the same application it would be helpful to have the current configuration stored on your PC (see saving a configuration to disk in Windows help program). After exchange the new module can be reloaded with the specific configuration.

To remove a module please proceed as follows:

- Unlock the module: on the right hand side of the slot there is a small protruding tab that needs to be slightly pressed to the right.



- Now pull the module out of the slot.
- Keep the anti-static packing material (original packaging material or adequate packaging) ready. Hold the module by the edges or the rear plate, do not touch the electronic components, strip conductors or pins. Slide the module into the anti-static packing material.

ATTENTION:

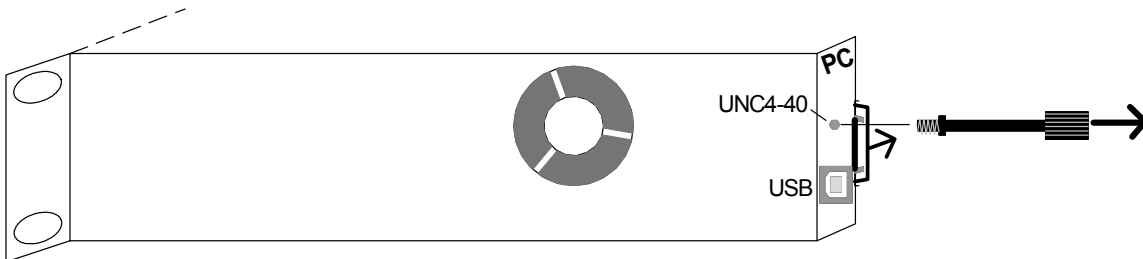


Observe precautions for handling electrostatic-sensitive devices. See "Electro Static Discharge (ESD) Precautions" at chapter A5 of the "Installation & Systems Manual RUBIDIUM SERIES" for details.

- Install the original front and rear panel cover plates if the slot is to remain empty. The frame is cooled by forced air drawn in from on side and expelled through the fan on the other side. In order to maintain this air flow no additional opening at the frame is allowed.

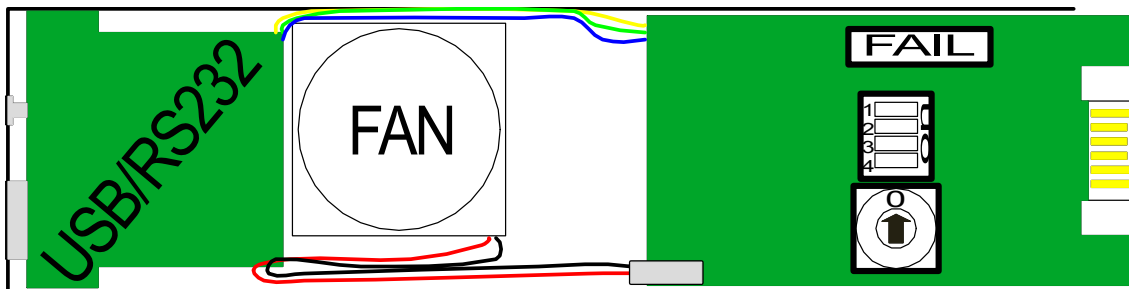
2.4 The Fan Module: Fan, Frame Address, TC_link Termination

The **RUB Q1** frame has a fan module integrated. It is located at one side of the frame behind the **PC** connector. There may be occasions when you must exchange this module:



- It is recommended to screw a typical 4-40 UNC DSUB locking bolt into the thread as shown. Unlock the module: on the right hand side of this small slot there is a small protruding tab that needs to be slightly pressed to the right. Now pull the module out of the slot.

This module is equipped with the fan and the fan control electronic, furthermore with a fail relay for error detection, a fourfold dip switch and a rotary switch.



The contacts of the fail relay are normally open during operation, but close if this module or the fan have a failure. The contacts are (in parallel with the fail relays of all modules plugged into this frame) connected to the FAIL_A and FAIL_B pins of the RLC connector of the frame.

Please notice: The fan alarm will be raised only if there is one configurable module plugged into this frame with checkbox **“Fan monitoring”** checked!

The fourfold dip switch can be used to terminate the “TC_link” interface (RS485 bus) of the RLC connector. In a system of one or two frames all the switches should be set to position ON (= terminated). In a system of more than two frames the switches of the first and the last frame should be set to position ON, all other to position OFF.

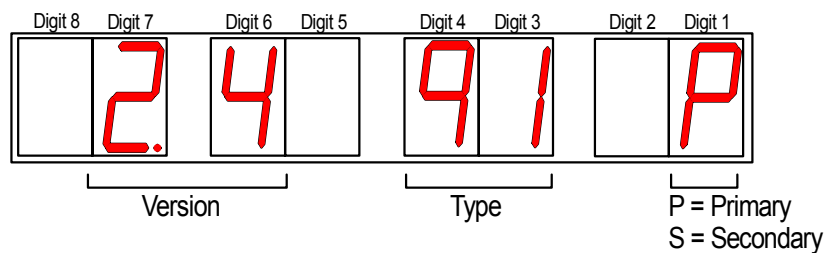
The rotary switch sets the frame number. A system of one frame only gets number 0 (= single). In a system consisting of more than one frame the rotary switches should be set to numbers > 0 in that way that each frame gets a unique number.

3 The Display

3.1 Overview

The front of **RUB Q1** shows an 8-digit display (7-segmented red LEDs) of 15 mm digit height.

After power-on, all of the LED's will light up shortly and then the display will show some status information:



This message disappears after a few seconds. The display waits for data. It only displays something if it receives valid data from the internal **TC_link** interface. In case no data will be received the display switches to a shut-off mode. As soon as valid data has been received the display returns to normal operation.

3.2 Two Displays in One System: Primary and Secondary

Connected via RLC two displays can operate in one system. Naturally the displays should show different data. To distinguish between the displays they get a different address selected by a jumper:

A display with the jumper installed will behave as the "primary" display.

A display with the jumper uninstalled will behave as the "secondary" display.

The jumper is assembled at the components side of the display circuit board on the upper right corner.

All the *Rubidium* modules which are able to send data to the display can be configured to address the "primary" or "secondary" display.

3.3 The “TC-link” Interface to Control the Display

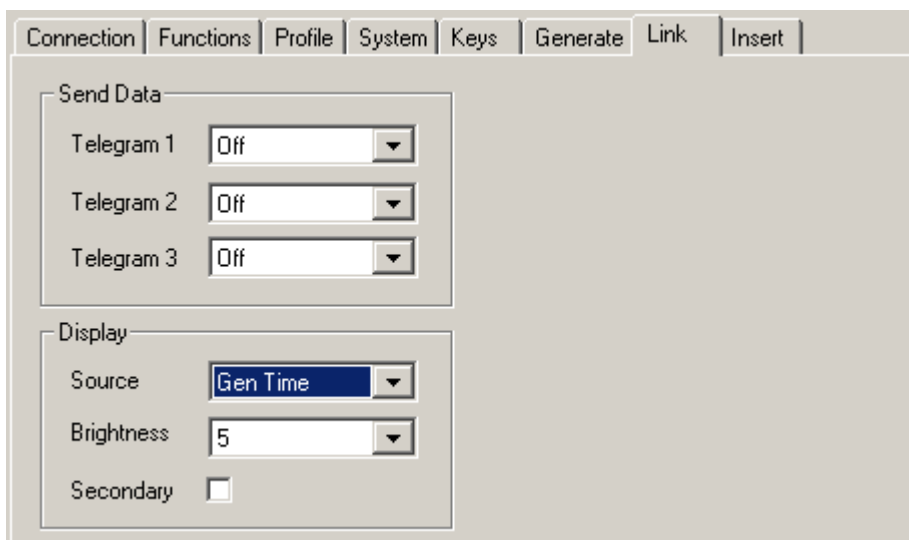
During normal operation the display only shows data if a *Rubidium* module sends data via the internal **TC_link** interface. This interface enables a communication between modules within the same frame and – connected via the **RLC** connector - even between modules located in different frames. Basically all configurable modules are able to send data to the display.

Example of configurable modules: GT, GL, AT, AV, DT, DV, HT, HV, VL, ...

Example of non configurable modules: PS, PQ, VD, IE, ...

Utilizing one of the configuration tools the data transfer can be programmed. Select one configurable module and activate the **Link** function.

Configuration (example shows a screen shot of the PC program tab):



Display

Adjust the parameters controlling the display:

Source	Select the kind of data to be sent and displayed:
Off	No data will be sent, the display switches to the shut-off mode.
Gen Time	Current time of the time code generator.
Gen User	Current user bits (binary groups) of the time code generator.
Read Time	Current time of the time code reader.
Read User	Current user bits (binary groups) of the time code reader.
Brightness	Adjust the brightness of the LEDs, steps 1 to 7.
Secondary	A click on this check box addresses the “secondary” display. Without a click the “primary” display will be addressed.