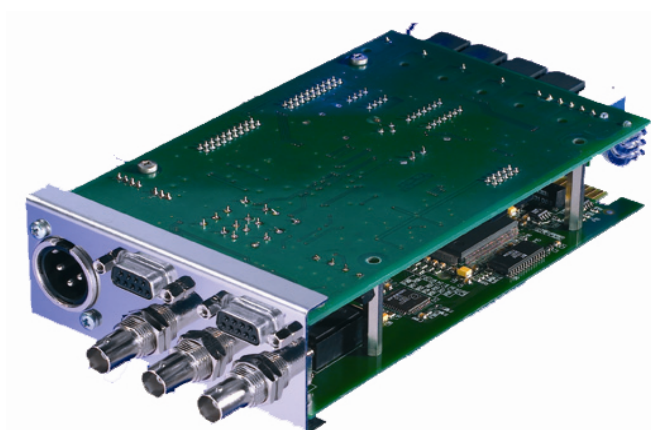


Daytime Inserter

Time & Date Video Windows Inserter
for RUB AI, DI, HI, XI Modules with Option "D"

Supplement to the "Installation & Systems Manual RUBIDIUM SERIES"



10 : 59 : 48 : 98 31 . 12 . 2006

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Option "D" Daytime Inserter

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A1 Revision History

No.	Date	Subject
1.0	July 06, 2006	First released document.
1.1	June 10, 2008	Revised
1.2	November 27, 2009	Some remarks added if used with option T. Corrections at "Link" function.
1.3	October 26, 2010	Revised.
1.4	November 16, 2011	Now available for XI modules as well.

A2 Copyright

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A3 General Remarks

This manual is a supplement to the "Installation & Systems Manual RUBIDIUM SERIES". It describes a special operating mode of AI or DI or HI or XI modules realized by the appropriate firmware. 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 Rubidium modules **AI** or **DI** or **HI** or **XI**.

- A3 Warranty,
- A4 Unpacking/Shipping/Repackaging Information,
- A5 Safety Instructions,
- A6 Certifications & Compliances,
- Plug-In a Module,
- Remove a Module.

1 Daytime Inserter

1.1 Description

The "Daytime Inserter" feature enables the module to visibly insert a time and a date in a video window. This insertion may be positioned all over the entire screen. Different formats of character representation are selectable. For example the time can have a HH:MM:SS:1/100 format, the date a Day.Month.Year format. All settings will be non-volatile stored in the module. The Rubidium module defines the video channel:

RUB AI: CVBS analogue video 525/60 (NTSC) or 625/50 (PAL).

RUB DI: Digital video channel (SD).

RUB HI: HD or SD digital video channel.

RUB XI: 3G or HD or SD digital video channel.

The internal clock of the module has to receive a start value after power-on, i.e. a time and a date has to be set. This can be done in the following way:

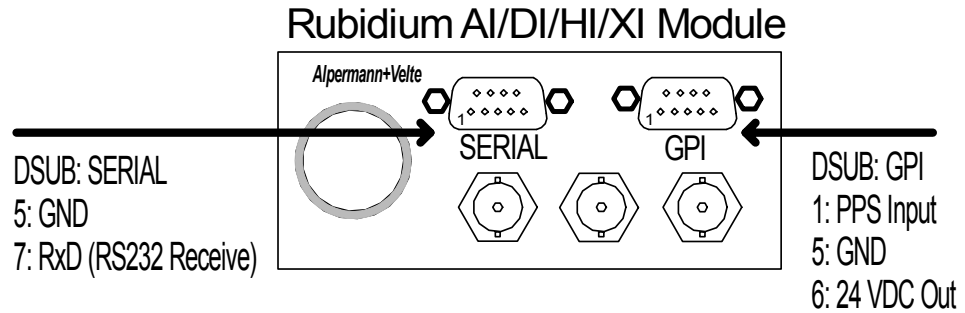
External Reference: In a basic operating mode the module is ready to receive a time & date information via serial interface, and a precise PPS (pulse per second) as the timing reference. With these inputs the internal clock will be synchronized. A DCF77 or GPS receiver as well as a PC may be the source of these signals. Without the option T the time and the date will stay at zero, until the external reference has synchronized the internal clock. Dependant on the system this may last some minutes, for example if a GPS receiver simultaneously has been switched on with the module and it has to track the satellites first.

Option T: With this option a battery-buffered real-time chip has been assembled. This chip makes a time & date available after power-on, even if no external reference has been connected. The time & date can be set manually utilizing the RUBIDIUM CONFIGURATION PC program or the RUBIDIUM SERIES HTTP server. If an external reference has been connected, the real-time chip will be synchronized to the reference.

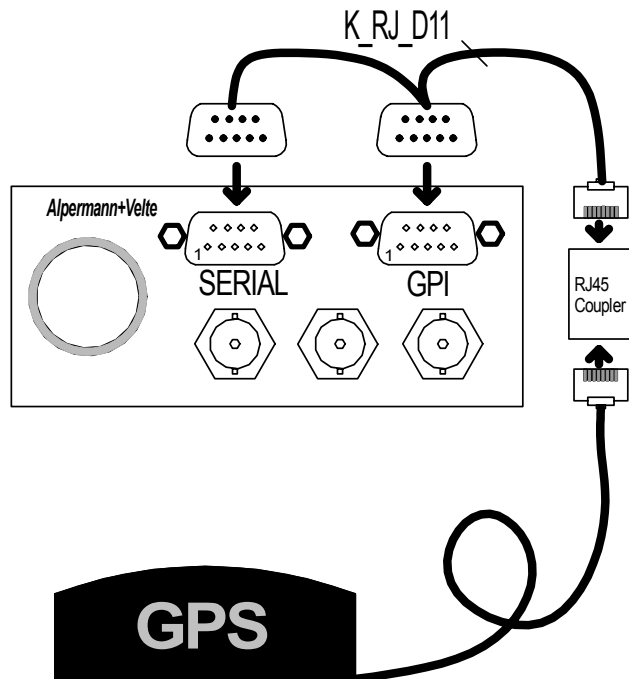
Option G: This option denotes an adapter cable, which makes it easy to plug the external reference. For the external reference please choose a device which has been recommended by Alpermann+Velte.

1.2 Connecting an External Reference

The Rubidium module receives time & date via a serial interface (signal "RxD" at DSUB SERIAL) and a PPS (signal "PPS Input" at DSUB GPI). The voltage output ("24 VDC Out" at DSUB GPI) may be used to deliver power to the external reference.



An adapter cable may be ordered as an accessory (option G). This cable will be manufactured suitable to link the module and the external reference:



Option "D" Daytime Inserter

1.3 Time Zone

If once synchronized the internal clock counts the time & date automatically. An automatic Daylight Saving Time switching is programmable. The time zone of the internal clock may have any offset to the time zone of the external reference.

The internal time base is the **UTC** (Universal Time Coordinated, GMT, world time). The module calculates the UTC from the reference input and the selected offset to UTC. This set-up is part of the configuration utilizing the RUBIDIUM CONFIGURATION PC program (at the 'Time Zone' tab) or the RUBIDIUM SERIES HTTP server (at the 'Time Zone' page).

The visibly displayed time & date is equal to the time & date of the internal clock, this represents the **local time zone**. The module calculates the local time zone from the UTC time base and the selected offset to UTC. This set-up is part of the configuration utilizing the RUBIDIUM CONFIGURATION PC program (at the 'Time Zone' tab) or the RUBIDIUM SERIES HTTP server (at the 'Time Zone' page).

The operator has to know the time zone of the reference, in order that the module can be configured with the correct offsets to UTC. If the reference utilizes DST (Daylight Saving Time), then the reference must send status information which indicates the current time zone (DST yes or no).

The local time zone can be selected independently from the reference, if the UTC time base can be calculated correctly. For example a DST switching of the local time zone can occur at different moments than it will occur for the reference time zone with DST.

If the time zone of the reference is not known and the local time zone should simply follow the reference, set the offsets to UTC to zero (regarding the reference offsets), and select the local time zone as "Same As Reference Input" utilizing the RUBIDIUM CONFIGURATION PC program (at the 'Reference' tab) or the RUBIDIUM SERIES HTTP server (at the 'Reference' page). The local time zone still can get offsets.

Details of the configuration are described in the chapters "Reference: Synchronization to a Time & Date Reference" and "Time Zone: Time Zone Adjustment".

With option **T** the time & date of the battery buffered real-time chip can be set manually: Utilizing the RUBIDIUM CONFIGURATION PC program (at the 'Generate' tab) or the RUBIDIUM SERIES HTTP server (at the 'Generate' page). Time & date must correspond to the local time zone.

1.4 Functional Description





The module visibly inserts time & date in a video window. Time & date will be generated by the internal clock which can be set and synchronized. This chapter describes the most important details of how the module operates.

Operating mode just after power-on with an external reference connected

This describes a power-up sequence, at which the module and a GPS receiver have been switched on simultaneously. The four programmable status LEDs at the front of the module are set into the default state.

Time after power-on	LEDs	Description	Time & date of the internal clock
0 – ≈ 60 s	OPER: On. SIGNAL: Rapidly flashing. SET: Off. ERROR: On.	Boot procedure. The module waits for serial data and the PPS signal. GPS receiver tracks satellites.	00:00:00:00 00.00.2000
≈ 60 – 70 s	OPER: Blinks once a second. SIGNAL: Slowly flashing. SET: On or flashing. ERROR: Off or flashing.	GPS receiver has synchronized. The module receives serial data and the PPS signal. The internal clock tries to phase-lock to the PPS signal.	13:27:59:98 24.12.2006
> 70 s	OPER: Blinks once a second. SIGNAL: On. SET: On. ERROR: Off.	The internal clock has been synchronized. The internal clock has been set with time & date.	13:28:09:98 24.12.2006

If everything works normal it can be verified by looking at the four LEDs:

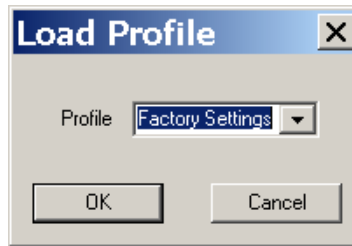
	LED	LED function	
	OPER	OPER	Blinks every second.
	SIGNAL	Gen Sync Status	Lights-up.
	SET	SET	Lights-up.
	ERROR	ERROR	Off.

Option "D" Daytime Inserter

Basic configuration

Upon delivery the module has been set to a basic configuration, so that the system consisting of an external reference and the module is operative. If there are fundamental problems the basic configuration can be installed with three steps:

1. "Factory Settings"
 Select at the "Profile" page or tab: Profile: **Factory Settings**
 Click on the **OK** button.



2. Select the data protocol of the external reference:
 Refer to chapter "Reference: Synchronization to a Time & Date Reference". Select the correct **Format**.
3. Select the **time zones**:
 Refer to chapter "Time Zone: Time Zone Adjustment". Select the time zone of the reference (usually = UTC) and of the local time.

Time & date representation in a video window

Select the format of character representation utilizing the RUBIDIUM CONFIGURATION PC program (at the 'Insert' tab) or the RUBIDIUM SERIES HTTP server (at the 'Insert' page).

Select **Format**: time & date representation:

Time	Date
HH:MM:SS:FF FF = 1/100	DD.MM.YYYY Day.Month.Year (year with 4 digits)
HH:MM:SS	MM.DD.YYYY Month.Day.Year (year with 4 digits)
MM:SS:FF FF = 1/100	YYYY.MM.DD Year.Month.Day (year with 4 digits)
HH:MM	DD.MM.YY Day.Month.Year (year with 2 digits)
MMMM:SS hours converted to minutes	MM.DD.YY Month.Day.Year (year with 2 digits)
MM:SS	YY.MM.DD Year.Month.Day (year with 2 digits)
SS:FF FF = 1/100	

Select **Delimiter**: select separate for time and date

Selection	Example
off	17513998
(Blank)	17 51 39 98
:	17 : 51 : 39 : 98
.	17 . 51 . 39 . 98
-	17 - 51 - 39 - 98
/	17 / 51 / 39 / 98

2 Modules AI, DI, HI and XI

2.1 Overview

The hardware consists of the video channel, the inputs for the external reference as well as some general purpose interfaces, which may be used for various special applications (GPI in/outputs).

A PC is required for the initial set-up and for configuration of this module. The front panel label visibly identifies where each module is located:

AI: CVBS analogue video 525/60 (NTSC) or 625/50 (PAL).

DI: Digital video channel (SD).

HI: HD or SD digital video channel.

XI: 3G or HD or SD digital video channel.

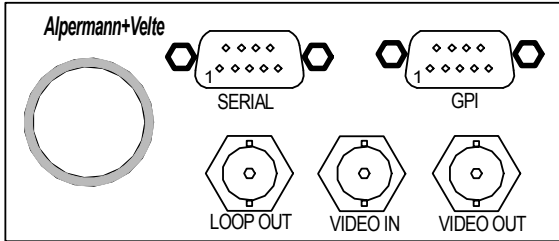
The serial number is located on the bottom side of the lower circuit board of each module.

The standard hardware of this module has all of the following key features:

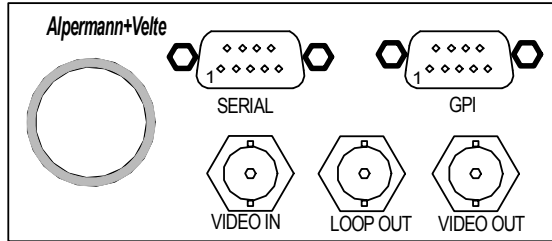
- "Hot Swapping", i.e. it is possible to insert or remove a module without interrupting the operation of other modules in this frame.
- Failure relay, connected to the FAIL_A and FAIL_B pins of the **RLC** connector at the rear of the frame.
- RS232 and TC_link (RLC connector) interfaces to have access to the internal bus of the chassis.
- Serial interface to receive time & date.
- Precise genlocking to an external PPS (pulse per second) signal.
- Video input/output to insert characters.
- Four programmable function keys on the front panel.
- Flash memory containing the firmware, so configuration and updates are possible via a PC connection (email attachments with software/firmware update files are possible).
- Four digital in- or outputs and one relay contact may be used in special applications.

2.2 Rear Panels and Connections

Connections at AI/DI – version 1



Connections at HI/XI and AI/DI – version 2




Pin assignments

SERIAL DSUB9F female	1: T- _TxD
	2: T+ _CTS
	3: LTC_OUT_A
	4: LTC_OUT_B
	5: GND
	6: R- _RTS
	7: R+ _RxD
	8: GPI_3
	9: GPI_4

GPI DSUB9F female	1: GPI_1 (PPS Input)
	2: GPI_2
	3: GPI_3
	4: GPI_4
	5: GND
	6: 24 VDC Out
	7: GPI_5
	8: LTC_IN_A
	9: LTC_IN_B

Signal descriptions

GND	Signal ground.
LTC_IN_A, LTC_IN_B	Reserved.
LTC_OUT_A, LTC_OUT_B	Reserved.
T-_TxD T+_CTS R-_RTS R+_RxD	<p>In- or outputs of the local serial interface. By configuration (selection of the source of reference) the appropriate electrical interface will be selected automatically:</p> <p>RS485: Signals T- and T+, balanced in/output.</p> <p>RS422: Signals T- and T+ = balanced output, signals R- and R+ = balanced input.</p> <p>RS232: TxD = transmit line, unbalanced data output. CTS = clear to send, handshake input. RTS = request to send, handshake output. RxD = receive line, unbalanced data input.</p>
GPI_1 ... GPI_4	General Purpose Interface, may be used as input or as output for digital signals according to application.
GPI_5	Relay contact (normally open). The relay contact shortens this pin to GND.
24 VDC Out	<p>24 VDC voltage output, 200 mA reversible fused. This output corresponds to the voltage output of the inserted "Power Supply" module. Please notice the power supply specifications.</p> <p> Using this output please make sure not to exceed the total power rating of the "Power Supply" module.</p>

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2.3 Specifications

Video channel VIDEO IN/LOOP OUT/VIDEO OUT

	AI	DI	HI	XI
Format	Analogue CVBS: PAL 625/50, NTSC 525/60	Serial digital, SMPTE 259M	Serial digital, HD: SMPTE 292M SD: SMPTE 259M	Serial digital, 3G: SMPTE 424M HD: SMPTE 292M SD: SMPTE 259M
Signal level VIDEO IN	1 V ± 15 mV	800 mV ± 10 %		
Signal level LOOP OUT	Loop-through of VIDEO IN	800 mV ± 10 %		
Signal level VIDEO OUT	Gain 1 ± 1 % (adjustable ± 4 %)	800 mV ± 10 %		
Connector	BNC (IEC 60169-8), 75 Ω			

Accuracy of the internal clock

PPS synchronous	Accuracy equal to the accuracy of the PPS signal.
Temperature dependant drift (no PPS connected)	< ± 50 ppm (4 s/day)
Option T: Accuracy of time during power-off state	< ± 7 ppm (0.6 s/day)

GPI

GPI_1 ... GPI_4: Input specification	Input "Low": -2.0 to +1.0 V Input "High": +3.0 to +24.0 V Impedance: 4.7 kΩ Frequency: 0 - 1 MHz
GPI_1 ... GPI_4: Output specification	Open Collector output of a NPN transistor at 4k7 pull-up resistor (5 VDC). Max. power dissipation: 200 mW. „High“ state: 4.3 V (no load). „Low“ state: Output switched to GND. Max. collector current: 100 mA DC, fused by a 100 mA auto-recovery fuse. Collector-emitter saturation voltage: @100 mA: typ. 200 mV (≤ 600 mV), @10 mA: typ. 90 mV (≤ 250 mV). Frequency: 0 - 150 kHz.
GPI_5: SPST-NO relay	Contact resistance: 0.2 Ω Max. switching power: 10 W Max. switching voltage: 175 VDC Max. switching current: 0.5 A Max. transportable current: 0.8 A

24 VDC Out

Output of the DC power supply of this module, normally = 24 VDC.	Reversible fused. A continuous current of up to 120 mA can be applied over the whole specified operating temperature range. At an ambient temperature of e.g. 22 °C the output switches to a high-resistance state after a few seconds if a current of 300 mA is applied.
--	---

Others

Operating voltage	12 - 30 VDC
Power consumption	AI modules (hardware version 1): Max. 5.0 W AI modules (hardware version 2): Max. 5.0 W DI modules (hardware version 1): Max. 4.5 W DI modules (hardware version 2): Max. 5.9 W HI modules: Max. 6.2 W XI modules: Max. 4.7 W
Weight	0.4 kg approx.
Mechanical	2 circuit boards (W x D): 100 x 160 mm / 3.94 x 6.30 inch Rear panel: Rub H1: 103 x 44 mm / 4.06 x 1.73 inch Rub H3: 8HP, 3RU
Environmental characteristics, operating	Temperature: 5 °C to 40 °C Relative humidity: 30 % to 85 %, non-condensing
Environmental characteristics, non-operating	Temperature: -10 °C to +60 °C Relative humidity: 5 % to 95 %, non-condensing

2.4 Software Update

Software updates require a (windows operating system) computer and the "RUBIDIUM CONFIGURATION" program.

Please check the **PC** connector at your RUBIDIUM housing: There is an USB or RS232 (with a DSUB9 connector) interface installed. You now need the same interface at your computer.

The new firmware should already be stored as a **.tcf** file at your computer.

Please now execute the following steps:

1. Connect your computer to the **PC** connector of that RUBIDIUM frame where the module has been plugged.

In case of an RS232 interface: Use a straight (1:1) connection between the **PC** connector at the RUBIDIUM frame and the RS232 of the computer.

In case of an USB interface: Use a USB A-B cable between your computer and the RUBIDIUM frame.

Switch on the power of all units.

2. Execute "Rubidium Config.exe" on your computer. Select the "Port" according to the interface (USB, RS232) you are using.
3. Select the module (unit 1, 2, 3 ...).
4. Select "Flash Update" in the *File* menu.
5. Open the **.tcf**-file. The following options are available at present:
 - OPT31 = With external reference, without option T,
 - OPT56 = Without external reference, including option T.From this the following standard files result:
 - "Rubidium AI OPT31 version.tcf" or "Rubidium AI OPT51 version.tcf".
 - "Rubidium AI (v2) OPT31 version.tcf" or "Rubidium AI (v2) OPT51 version.tcf".
 - "Rubidium DI OPT31 version.tcf" or "Rubidium DI OPT51 version.tcf".
 - "Rubidium DI (v2) OPT31 version.tcf" or "Rubidium DI (v2) OPT51 version.tcf".
 - "Rubidium HI OPT31 version.tcf" or "Rubidium HI OPT51 version.tcf".
 - "Rubidium XI OPT31 version.tcf" or "Rubidium XI OPT51 version.tcf".

"version" stands for a revision no., e.g. 2.0.184.

Click the OK button, update starts. Click the OK button at the end.

6. Update is finished now. We recommend to check module's configuration utilizing the "RUBIDIUM CONFIGURATION" program.

During the flash update the operation of the module stops!

3 The Rubidium Configuration Tools

3.1 The Rubidium Configuration PC Program

Please refer to the

"Installation & Systems Manual RUBIDIUM SERIES"

for a general description of this program and how to install it. At this document please notice the following subchapters:

- Overview
- Installation
- Connection to RUBIDIUM SERIES Chassis
- Starting the Program
- Store, Load and Update the Configuration on your PC
- The "Profile" Tab: Store and Load Configurations on the Module
- The "System" Tab: Module Identification, Reset, SNMP, Fan Control ...

The program RUBIDIUM CONFIGURATION uses various tab cards. With one click on the button **Configure**, all available and currently activated tabs of this specific module are displayed.

Any changes at a tab will immediately be stored at the module. If you enter a number or a text press the **tabulator key** at the PC's keyboard afterwards.

3.2 The Rubidium Series HTTP Server

Please refer to the

"Installation & Systems Manual RUBIDIUM SERIES"

for a functional overview and for an installation description of this program. You will find the chapter "The RUBIDIUM SERIES HTTP Server" and its subchapters:

- Overview, Connecting the IE Module
- IP Configuration, the Rubidium Homepage
- Access to a RUBIDIUM SERIES Module
- The "Profile" Page: Store and Load Configurations on the Module or on the PC
- The "System" Page: Module Identification, Reset, SNMP, Fan Control ...

As soon as a communication to a single module has been established, the **Configuration** page gives a list of all the links, which correspond to all the currently available or used pages of this specific module.

Changes at a page will not be stored at the module automatically. At the bottom of each page there are two buttons which should be used to store or load the module's configuration:

Button **Save To Module**:

- Click on this button to transfer all settings on this page to the module.

Button **Reload From Module**:

- Click on this button to load the current configuration of the module.



Every time you click on the blue button which indicates the module under configuration a **Reload** will be done automatically.

3.3 "Functions"

Click on **Functions** to see all applicable tabs/pages listed, and to activate or deactivate tabs/pages. For example (screen shot of the PC program tab):

Insert	Generate	Reference	Time Zone	Link
Connection	Functions	Profile	System	Keys
	Edit	Use		
System	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Keys	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Video	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Insert	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

A tab/page reflects a function of the module. The columns **Edit** and **Use** determine whether the function in the module is activated/deactivated and whether user configuration of that specific function is allowed or not.

Click on the applicable **Edit** and/or **Use** check-boxes to activate/deactivate a function:

Edit	Use	
		Function is deactivated, the tab is not visible.
√	√	Function is activated, the tab is visible and configurable.
	√	Function is activated but the tab not visible and therefore not configurable.

- We suggest that you deactivate the **Use** check-boxes of all functions you are presently not using.
- We suggest that you deactivate the **Edit** check-boxes of all functions you are presently not configuring. That avoids unintentional operating and malfunctions.

List of tabs/functions:

System:	Identification, Reset, SNMP Traps, Fan Control ... (*1)
Keys:	Keys, Lamps, LEDs and GPIs
Video:	Video System and General Setup of the Video Channel
Insert:	Setup of all Video Windows
Generate:	PPS Signal and Manually Time Set (*2)
Reference:	Synchronization to a Time & Date Reference (*2)
Time Zone:	Time Zone Adjustment (*2)
Link:	Communication between Modules (*2)
Profile:	Store and Load Configurations on the Module (*1, *2)

*1: Refer to "Installation & Systems Manual RUBIDIUM SERIES"

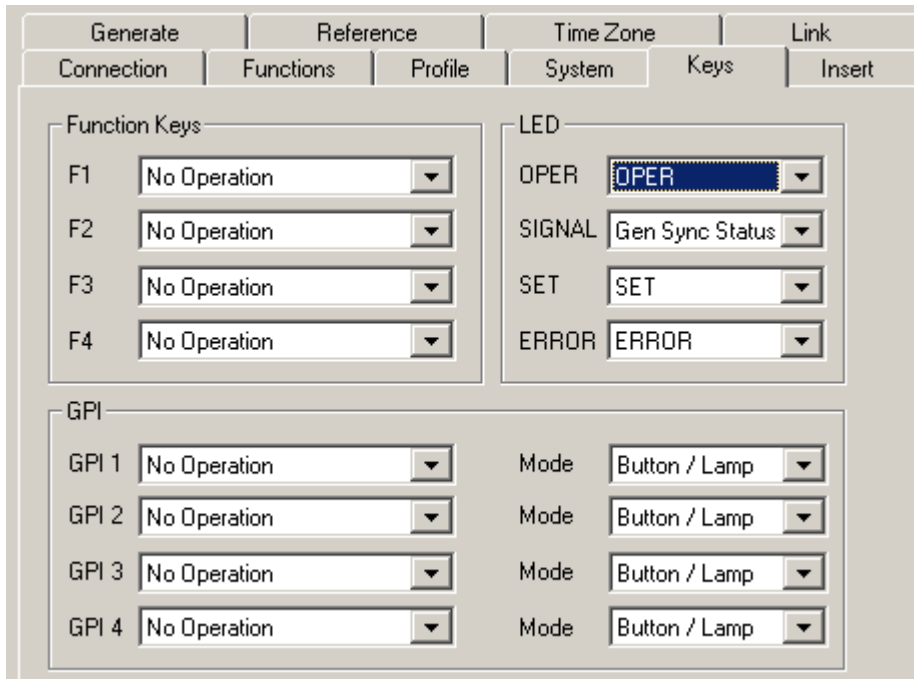
*2: This is a basic function of this special module, so no **Edit** and **Use** check boxes have been provided.

3.4 "Keys": Keys, Lamps, LEDs and GPIs

The module has four illuminated buttons (keys and lamps), four LEDs (Light Emitting Diodes) and four GPIs (General Purpose Interface). The functions of these in- and outputs are programmable.

Some functions are assigned to special options, and therefore are not applicable with the standard firmware. For further information, please contact **Alpermann+Velte**.

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



Function Keys

Four keys F1, F2, F3 and F4 can get a function independently from each other. Select a function from the dropdown list. This selects the function of the lamps as well.

Remark:
In a typical application the keys get a "Load Profile" function. For example select different positions for the video window, each configuration should be stored as a separate ,profile'. A simple key stroke will then recall this configuration.

LED

Four LEDs (named OPER, SIGNAL, SET and ERROR) can get a function independently from each other. Select a function from the dropdown list.

Remark:
It is recommended not to change the basic setup of these LEDs, because this special firmware uses the basic functions to visualize the most important signals – please notice chapter "Functional Description" for details.

GPI

Four GPIs can get a function independently from each other, as an input or as an output. Additionally the switching characteristic (as a push button or a toggle switch) is selectable. Select from the dropdown lists.

Remark:

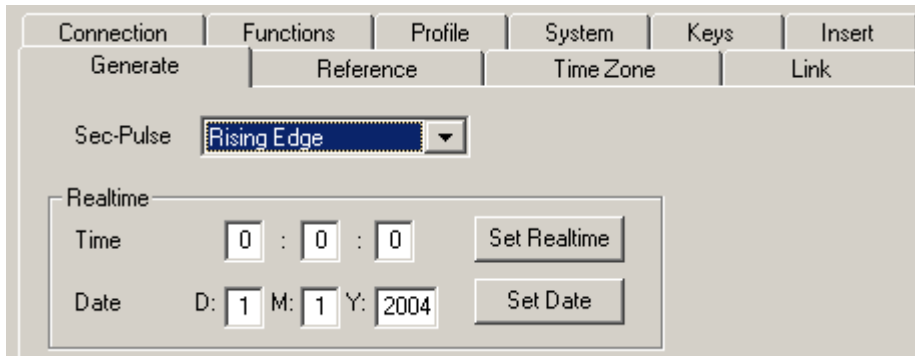
GPI 1 is the input for the external pulse per second signal (PPS). Please do not select a function for this GPI.

Option "D" Daytime Inserter

3.5 "Generate": PPS Signal and Manually Time Set

The module has an internal clock built-in. In an operating with an external reference this clock tries to phase-lock to the PPS signal. Without an external reference the clock will lock to the internal oscillator. The clock can manually be set to a time and date.

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



Sec-Pulse: Select the reference edge of the external PPS signal:
Rising Edge
Falling Edge

Realtime

Option T only: You can set time and date of the internal clock. This may be useful if there is the option T installed and no external reference is connected. It is necessary only if the internal clock shows a significant deviation compared the actual local time. In the power-off state the time will be count by a battery buffered real-time chip.

Time: Enter a time (HH:MM:SS). The values set will be stored in the module. Press the **Set Realtime** button to set the time of the internal clock.

Date: Enter day (D), month (M) and year (Y). The values set will be stored in the module. Press the **Set Date** button to set the date of the internal clock.

3.6 "Reference": Synchronization to a Time & Date Reference

Define the reference source, the time zone status and the mode of synchronisation.

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

Reference

Select the signal source and the data format:

Source: Indicates the current selected source. At present there is no selection possible.

Format: Indicates the current selected data format. At present there are some serial data protocols selectable. The selected protocol has to match the serial data format of the external reference.

Example: "Meinberg Std 2400/7e2 + PPS": Appropriate for GPS 10 MHz.
"\$GPRMC 4800/8n1 + PPS": Appropriate for GPS35 or GPS16.

Time Zone and DST Mode

Define the time zone of the reference and the local time zone of the internal clock.

Reference Input: The module uses the UTC (Universal Time Coordinated, GMT, world time) as an internal time base. With these settings and the settings **Offset Reference Input** at the **Time Zone** tab the module can calculate the UTC from the reference input.

AUTO: Time, date and status data of the signal input indicate the time zone of the reference. The reference may utilize DST (Daylight Saving Time). The settings "Offset from UTC" and "DST Bias" at the **Time Zone** tab will be used.

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- UTC: The time zone of the reference does not utilize DST (Daylight Saving Time), the 'UTC' status will be set for internal use. The setting "Offset from UTC" at the **Time Zone** tab will be used!
- Standard Time Only: The time zone of the reference does not utilize DST (Daylight Saving Time), the 'Standard Time' status will be set for internal use. The setting "Offset from UTC" at the **Time Zone** tab will be used.
- Daylight Saving Time Only: The time zone of the reference does not switch the DST (Daylight Saving Time), the 'DST' status will be set for internal use. The settings "Offset from UTC" and "DST Bias" at the **Time Zone** tab will be used.

GT Time Zone: These settings refer to the local time zone status of the internal clock and to the priority of reference time versus local time at the moment of synchronisation.

- Auto + Reference Check: The local time zone utilizes DST, the switching occurs automatically according to the settings at the **Time Zone** tab. At the moment of synchronisation (according to the "Periodically" setting at **Mode of GT Time Zone Synchronisation**) the time of the reference may not differ more than one minute from the expected time value.
- UTC + Reference Check: The local time zone does not utilize DST (Daylight Saving Time), the 'UTC' status will be set for internal use. The setting "Offset from UTC" at the **Time Zone** tab will be used! At the moment of synchronisation (according to the "Periodically" setting at **Mode of GT Time Zone Synchronisation**) the time of the reference may not differ more than one minute from the expected time value.
- UTC: The local time zone does not utilize DST (Daylight Saving Time), the 'UTC' status will be set for internal use. The setting "Offset from UTC" at the **Time Zone** tab will be used!
- Standard Time Only: The local time zone does not utilize DST (Daylight Saving Time), the 'Standard Time' status will be set for internal use. The setting "Offset from UTC" at the **Time Zone** tab will be used.
- Daylight Saving Time Only: The local time zone does not switch the DST (Daylight Saving Time), the 'DST' status will be set for internal use. The settings "Offset from UTC" and "DST Bias" at the **Time Zone** tab will be used.
- Same As Reference Input: The local time zone follows the status of the reference input (UTC, Standard Time, DST). A DST switching of the local time zone only occurs if the reference time zone switches. The settings "Offset from UTC" and "DST Bias" at the **Time Zone** tab will be used.

Manual

Press the **Update Now!** button to let all changes at this tab immediately get effective for the internal calculations and the output signals of the module. Pressing this button forces to update/synchronize the internal clock with the reference input.

Mode of GT Time Zone Synchronisation**Periodically**

The internal clock can be synchronised automatically to the reference time input.

Mode:

- Off: No periodically synchronisation.
- Every Second: Synchronisation every second.
- Every Day: Synchronisation once a day, at the selected **Hour**.
- Every Week: Synchronisation once a week, at the selected **Day of Week** and **Hour**.
- Every Month: Synchronisation once a month, at the selected **Day** and **Hour**.
- Every Year: Synchronisation once a year, at the selected month **Month** and **Day** and **Hour**.

The settings **Day**, **Day of Week**, **Month** and **Hour** will be used dependent on the "Mode" selection.

At Special Events

Additionally to the moments selected at the **Periodically** setting a synchronisation can be programmed to occur at special events.

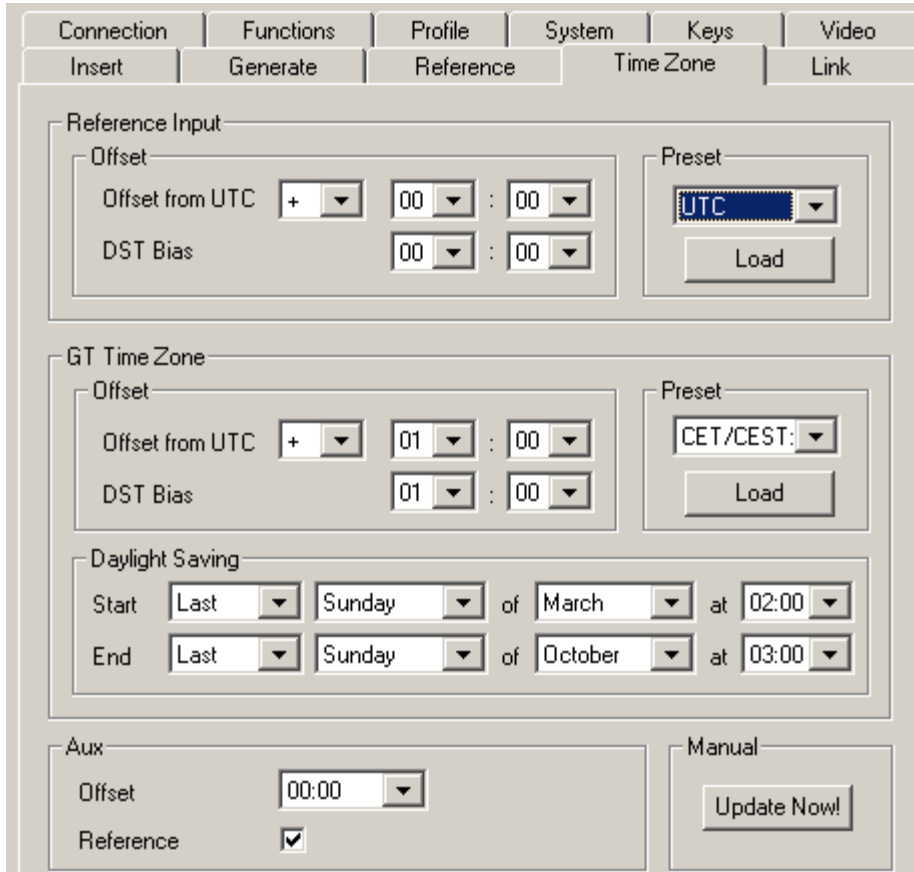
After DST Switching of Reference Input: Activate this check box to synchronise the local time if the reference time switches the time zone (start or end of DST). The DST switching has to be announced in the status data of the reference input.

After Leap Second of Reference Input: Activate this check box to synchronise the local time if the reference time will be corrected through a leap second. The leap second adjustment has to be announced in the status data of the reference input.

3.7 "Time Zone": Time Zone Adjustment

Select the time zone of the reference and the local time zone.

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



Reference Input

The module uses the UTC (Universal Time Coordinated, GMT, world time) as an internal time base. With these settings and the settings **Reference Input** at the **Reference** tab the module can calculate the UTC from the reference input.

Preset:

You can select the time zone of the reference from the dropdown list. With a click on the button **Load**, the settings **Offset from UTC** and **DST Bias** will be entered automatically.

Offset:

Offset from UTC: Enter the sign and hours/minutes offset to UTC.

DST Bias: Enter the DST correction value in case the reference input has a DST period. Most of the cases the correction value will be one hour.

GT Time Zone

The module generates the local time zone. With these settings the module can calculate the local time zone from the internal time base (= UTC).

Preset:

You can select the local time zone from the dropdown list. With a click on the button **Load**, the settings **Offset from UTC**, **DST Bias** and **Daylight Saving** will be entered automatically.

Offset:

Offset from UTC: Enter the sign and hours/minutes offset to UTC.

DST Bias: Enter the DST correction value in case the local time zone has a DST period. Most of the cases the correction value will be one hour.

Daylight Saving:

The local time zone may have a Daylight Saving Time (DST). These settings determine the moments of switching on and off the DST, referenced to the local time.

Start: Using these inputs (e.g. last Sunday of March at 2 o'clock) GT calculates the start of DST for the current year.

End: Using these inputs (e.g. last Sunday of October at 3 o'clock) GT calculates the end of DST for the current year.

Aux

These settings are of no value for AI or DI or HI or XI modules.

Manual

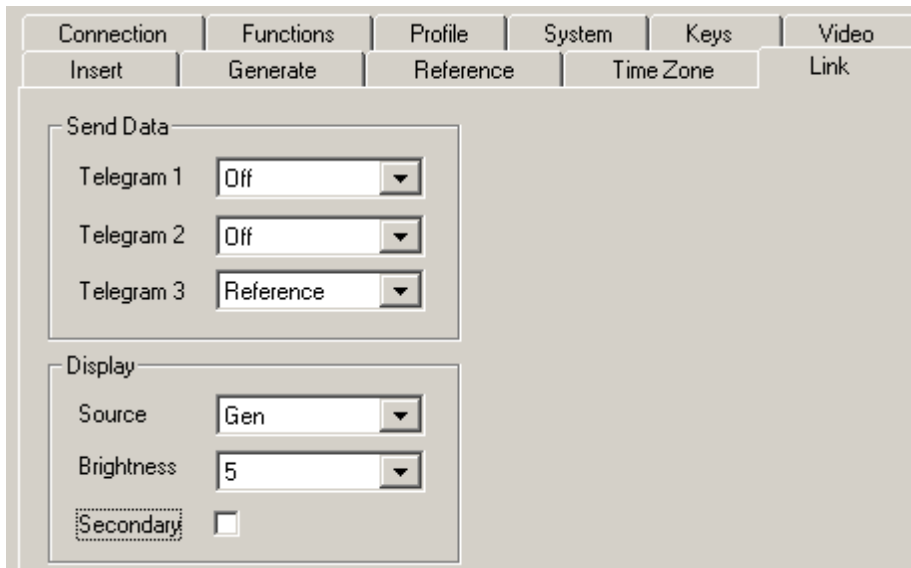
Press the **Update Now!** button to let all changes at this tab immediately get effective for the internal calculations and the output signals of the module. Pressing this button forces to update/synchronize the internal clock with the reference input.

3.8 "Link": Communication between Modules

Link uses the internal RS485 interface to transmit data. This interface is shared by all the modules in one frame, and via the **RLC** connector it is possible to link further modules at different frames.

This module can transmit data. **Link** selects the channel and the kind of data.

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



Send Data

Three channels have been provided to transmit data:

Telegram 1, Telegram 2, Telegram 3.

Select a function from the drop-down list:

- Off** This channel will not be used to transmit data.
- Gen** This channel transfers data in a time code format (frame rate = 10).
- Reference** This channel transfers time and date of the internal time base (= UTC) once a second. This can be a time & date source for the Alpermann+Velte NTP server located in the Rubidium IE module.

Display

Adjust the parameters controlling a display (RUB D1):

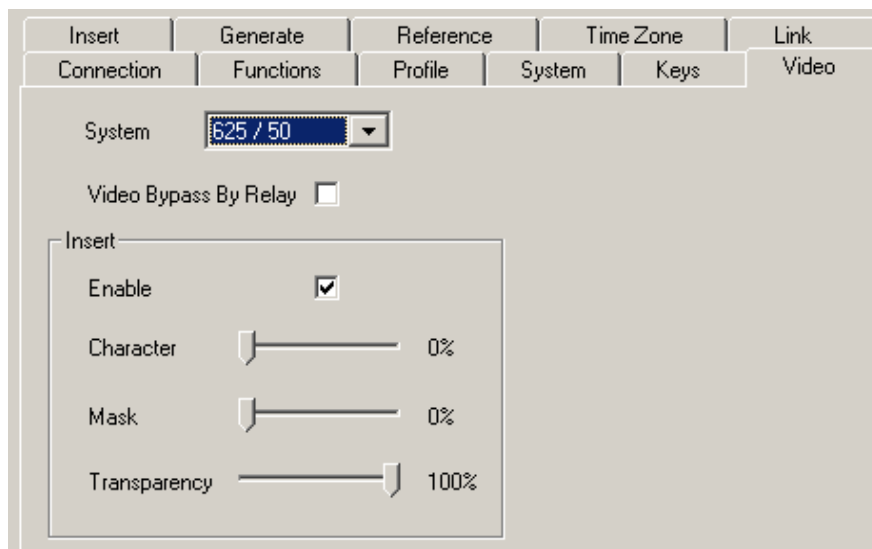
- Source** Select the kind of data to be sent and displayed.
 - Gen** Transmits the local time in HH:MM:SS:1/10 format.
 - Reference** Transmits the local time in HH:MM:SS format.
- Brightness** Adjust the brightness of the LEDs, steps 1 to 7.
- Secondary** A click on this check box addresses the "secondary" display. Without a click the "primary" display will be addressed.

3.9 "Video": Video System and General Setup of the Video Channel

3.9.1 Modules AI: Analogue Video Channel

"AI" modules have a CVBS analogue video channel.

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



System: Select the video standard:
 Auto Auto-detect of video standard.
 625/50 PAL system.
 525/59.94 NTSC system.

It is recommended not to use the "Auto" mode if the module operates only at one video standard.

Video Bypass By Relay: Option B only (Video Bypass Relay): Enables to manually switch to video bypass.

Insert

Enable: If this check box is activated: All video windows which have the "visible" check box activated (see the **Insert** tab) will be inserted in the video signal.
 If this check box is deactivated: Bypass of the video signal, i.e. all the video windows will be switched off.

If you change the "Character", "Mask" and "Transparency" setup you should verify the changes, so make sure to have a video window inserted, and connect the video output to a video control monitor.

Character: Draw the slider to adjust the brightness of all the inserted characters.

Mask: Draw the slider to adjust the brightness of all the background masks.

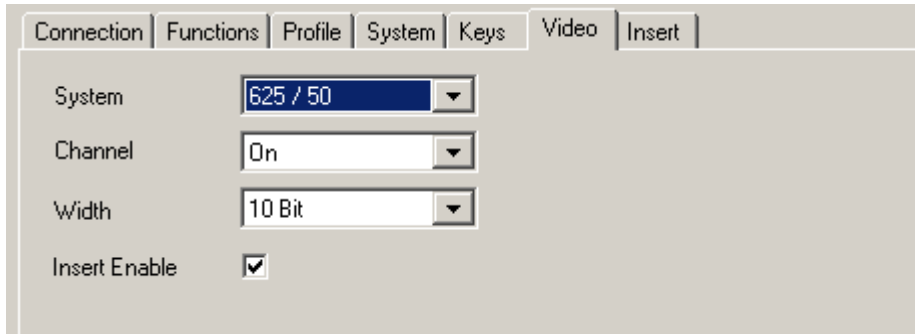
Transparency: Draw the slider to adjust the mixing of video signal and character insertion.

Option "D" Daytime Inserter

3.9.2 Modules DI: Digital Video Channel (SD)

"DI" modules have a serial digital video channel (SD).

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



- System:** Select the video standard:
- Auto Auto-detect of the video standard.
 - 625/50 PAL system.
 - 525/59.94 NTSC system.

It is recommended not to use the "Auto" mode if the module operates only at one video standard.

- Channel:** Setup of the video output:
- Off Video output switched off.
 - On Normal operation: The video input signal passes through the video channel, signals will be added as programmed (visible video windows).
 - Pass Thru The video input signal passes through the video channel, but the video signal will be left unchanged.
 - Short Pass Thru The video input signal will be left unchanged and will be passed to the output with minimum delay.
 - Relay Bypass Option B only (Video Bypass Relay): Enables to manually switch to video bypass.

Width: Format of the serial data words: 8 bit or 10 bit.

Insert Enable: If this check box is activated: All video windows which have the "visible" check box activated (see the **Insert** tab) will be inserted in the video signal.

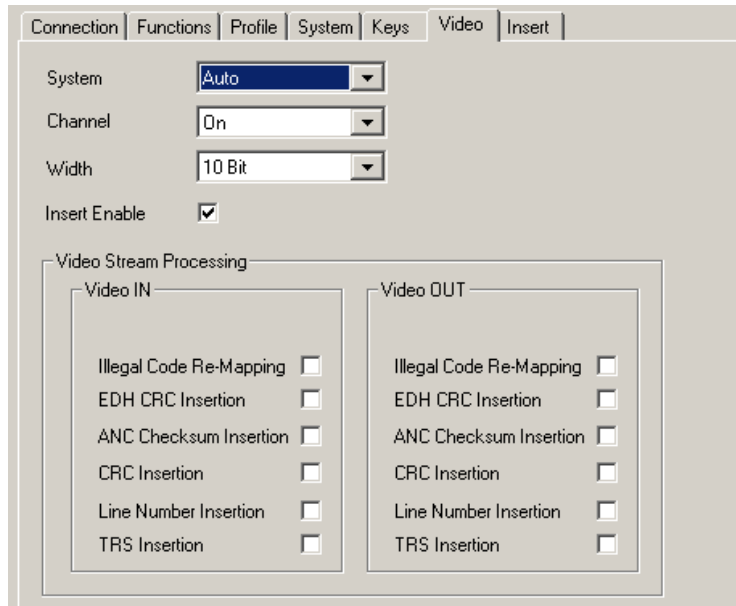
If this check box is deactivated: Bypass of the video signal, i.e. all the video windows will be switched off. The input to output delay will be left unchanged.

3.9.3 Modules HI or XI: Digital Video Channel

"HI" modules accept digital video of HD or SD format.

"XI" modules accept digital video of 3G or HD or SD format.

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



System: Select the video standard:
 Auto Auto-detect of the video standard.
 All other Select the video standard from the dropdown list.

It is recommended not to use the "Auto" mode if the module operates only at one video standard.

Channel: Setup of the video output:
 Off Video output switched off.
 On Normal operation: The video input signal passes through the video channel, signals will be added as programmed (visible video windows).
 Pass Thru The video input signal passes through the video channel, but the video signal will be left unchanged.
 Short Pass Thru The video input signal will be left unchanged and will be passed to the output with minimum delay.
 Relay Bypass Option B only (Video Bypass Relay): Enables to manually switch to video bypass.

Width: Format of the serial data words: 8 bit or 10 bit.

Insert Enable: If this check box is activated: All video windows which have the "visible" check box activated (see the **Insert** tab) will be inserted in the video signal.

If this check box is deactivated: Bypass of the video signal, i.e. all the video windows will be switched off. The input to output delay will be left unchanged.

Video Stream Processing

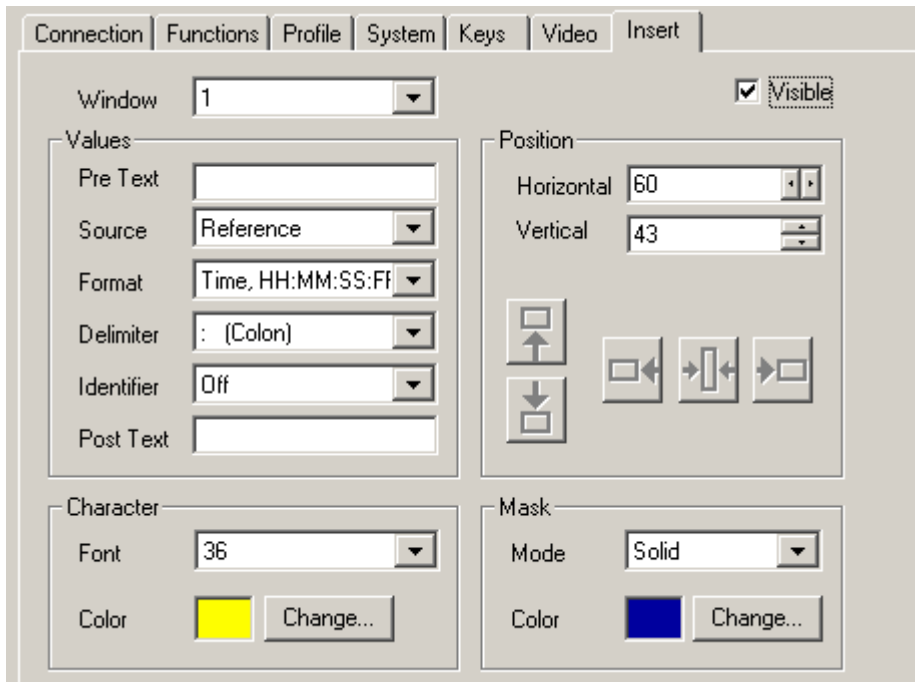
Some data processing functions can be set independent for Video IN and Video OUT.

Option "D" Daytime Inserter

3.10 "Insert": Setup of all Video Windows

Each video window can get an individual setup. It is recommended to connect the video output to a video control monitor so you can verify the changes at this tab immediately.

Configuration (example shows a screen shot of the PC program tab for DI/Hi/XI modules):



Window: Select the video window, all the following setups refer to this window.

Visible: Click on the control box to select "visible" (window insertion switched on) or not visible (window insertion switched off).

Position

Horizontal: Adjust the horizontal position of the video window: Enter a number and press the **tabulator key** at the PC's keyboard or click on the arrow keys by the side of the window.

Vertical: Adjust the vertical position of the video window: Enter a number and press the **tabulator key** at the PC's keyboard or click on the arrow keys by the side of the window.



Click on these buttons to set the video window at the upper/lower border of the screen. The horizontal position will be left unchanged.



Click on these buttons to set the video window at the most left/center/most right position of the screen. The vertical position will be left unchanged.

Values

TC1 10 : 59 : 28 : 13 G1

Pre Text

Source/Format
DelimiterIdentifier
Post Text

Pre Text: A text can be placed right before the source characters. Enter the text and press the **tabulator key** at the PC's keyboard.

Source: Select the data source from the drop-down list.

Format: Select the data format (representation of the data) from the drop-down list.

Delimiter: Select the delimiter from the drop-down list, if the data format uses one.

Identifier: You can add a source identifier following the source characters. Select from the drop-down list:

Off = No source identifier.

Letter = One character, e.g. "G" for generator.

String = Two characters plus possibly a field identifier, e.g. "VR1" stays for VITC reader data of the first field.

Post Text: Instead of an identifier ("Identifier = Off") you can add a text following the source characters. Enter the text and press the **tabulator key** at the PC's keyboard.

Character

Font: Select the character font from the drop-down list:

Font	Pixel Matrix H x V (*)	max. characters horizontal (about)	max. windows vertical (about)
16	10 x 16	63	32
20	12 x 20	52	25
24	14 x 24	44	21
28	16 x 28	39	18
36	20 x 36	31	14
48	27 x 48	23	11
64	35 x 64	17	8
72	39 x 72	16	7

(*: Pixel clock horizontal = 13.5 MHz, vertical = "interlaced" video line)

Color: Modules DI/HI/XI only: Select the colour of the character insertion. The current colour is indicated. Click on the **Change...** button to change the colour. Refer to the description below for more information.

Option "D" Daytime Inserter

Mask

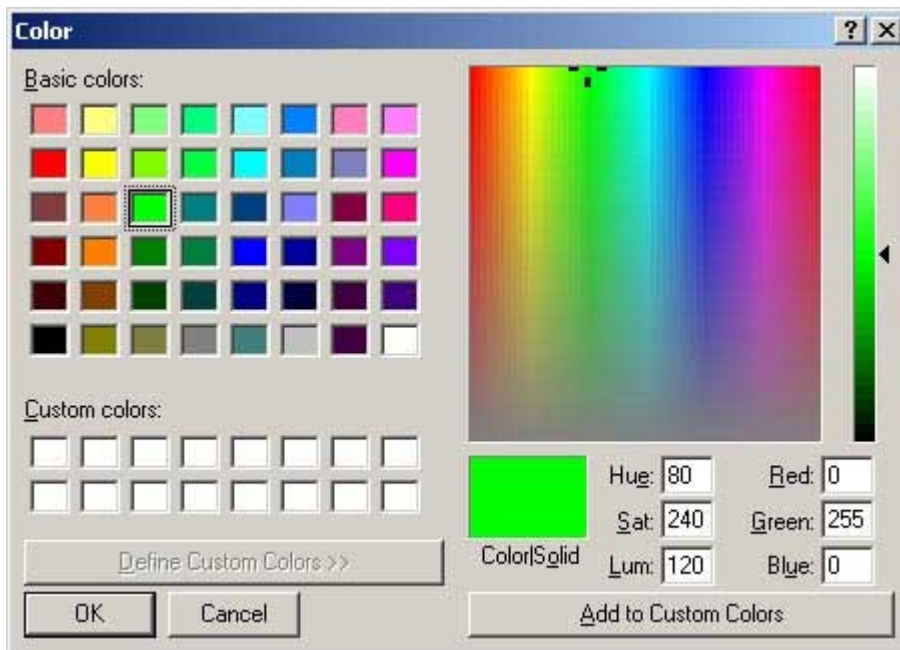
A background mask can be added to the character insertion. Select from the drop-down list:

Mode: Off No background mask.
Solid With background mask.
Dimmed Modules DI/Hi/XI only: Reducing the luminance of the video signal in the video window area.

Color: Modules DI/Hi/XI only: Select the colour of the background mask ("Mode" = "Solid" only). The current colour is indicated. Click on the **Change...** button to change the colour. Refer to the description below for more information.

Modules DI/Hi/XI only:

Change...: Select the colour of the character insertion or the background mask:



Click on any of the colour boxes to use an already defined colour: "Basic color" or "Custom color".

If you want to define your own colour you can:

- Enter a value in the **Hue, Sat, Lum** boxes.
- Enter a value in the **Ret, Green, Blue** boxes.
- Select colour and saturation: Use the mouse button to draw the pointer at any place within the colour spectrum. Select brightness: Use the mouse button to draw the pointer at any place within the brightness bar.

Press the **OK** button at the end.

4 Options

4.1 Option B: Video Bypass Relay

With this option the module is equipped with a bypass relay:

- The bypass relay appears in the video input to output path, not in the video loop path.
- The main functionality is to maintain the video path even in an event of power failure.
- The bypass relay can be switched remote controlled by a GPI function: A function key or one of the GPI inputs can be programmed with the "GPI: Relay Bypass" function (see the "Keys" page of a Rubidium configuration tool).

Technical data of the relay:

Modules AI	
Initial insulation resistance	100 M Ω minimum
Initial contact resistance	50 m Ω maximum
Max switching power	24 W
Max switching current	1 A
Max switching voltage	24 V
Modules DI	
Cutoff frequency	1 GHz
Insertion loss	< 1 dB
Impedance	75 Ω
Max switching power	24 W
Max switching current	1 A
Max switching voltage	24 V
Modules HI or XI	
Cutoff frequency	2.6 GHz
V.S.W.R.	Max. 1.5
Insertion loss	< 1 dB
Impedance	75 Ω
Max switching power	1 W
Max switching current	0.5 A
Max switching voltage	30 V