plura®
TIMING SOLUTIONS

Rubidium Series
TCC70XS Series
Standalone Systems

Read and Insert Time & Date

Rubidium AT/AV/XT/XV and TCC70XS Application Note
Revision: 2.3
February 7, 2024

The following description walks you through the installation and the basic set-up process for your special application of an **AT/AV** or **XT/XV** Rubidium module.

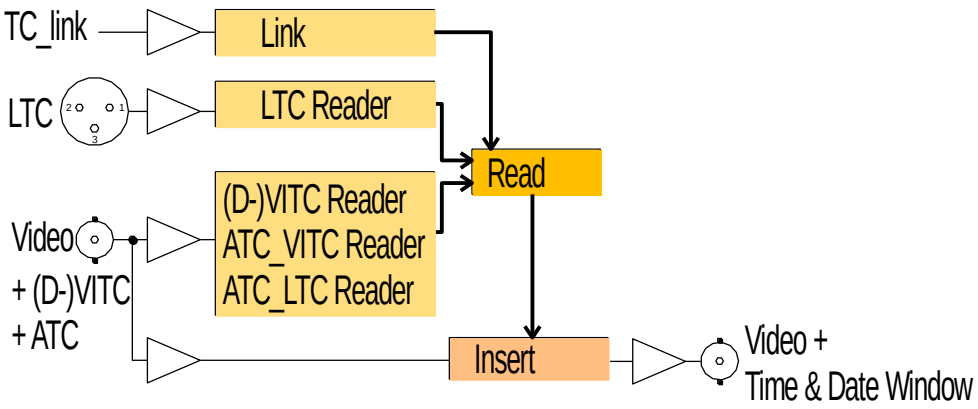
Select the module:

- According to the video standard you are using:

AT/AV: Analogue video (CVBS).
XT/XV: 3G or HD or SD digital video.

- According to the time code format you are using:

AT/XT: LTC time code involved.
AV/XV: No LTC time code involved, only video time codes.



Time code generators in a real-time mode (RUB GT, RUB GL, GM-TTT, ...) can generate the local time in the time addresses and the local date in the binary groups of the time code. Reading and inserting the local time does not need any special treatment, but care has to be taken decoding the date out of the binary groups properly:

1. Find out how the date is encoded.

   There are many methods transporting the date in the binary groups. Some follow known specifications; others are a sort of manufacturer's standard. Because any number from 01 to 12 could mean a day or a month or a year, it is not possible for a time code reader to automatically detect the underlying method. Therefore, the reader has to provide a suitable configuration and the operator has to know the method and do the correct installation.

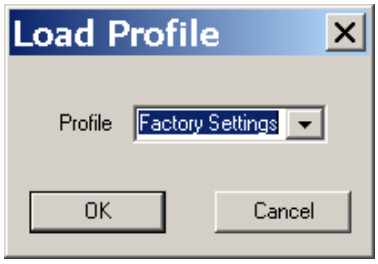
2. Choose the representation of the date.

   Once the correct date is known to the module, it now can be visibly displayed and inserted in various representations. Some people like it day-month-year, other month-day-year, and so on, with different delimiter symbols. RUBIDIUM inserters offer these configurations.

Note: *There is no automatic date counting provided, so a time code input containing the date is required.*

Step 1:

Load Factory Settings: Preset a Basic Configuration



Activate the **Profile** page and select: Profile: **Factory Settings**

Click on the **OK** button.

Step 2:

Activate/Deactivate Functions, Enable the Time Code Reader

Activate the **Functions** page. Enable the time code reader according to your time code input. AT module: LTC or VITC or "Link" or any combination. AV module: VITC or "Link" or both.

XT modules: LTC or D-VITC or ATC or "Link" or any combination.

XV modules: D-VITC or ATC or "Link" or any combination.

If there is time code input via RUBIDIUM TC_link, click **Use** at "Link".

If there is time code input via ATC, click **Use** and **Edit** at "ANC Read" and enable the ATC_LTC and/or ATC_VITC reader with the **ANC Read** function.

This application further requires the **Read** and **Insert** functions.

For example, **activate/deactivate** as shown:

RUB AT

	Edit	Use
System	☑	☑
Keys	☑	☑
Read	☑	☑
LTC Read	☐	☑
VITC Read	☐	☑
Jam	☐	☐
Generate	☐	☑
LTC Generate	☐	☐
VITC Generate	☐	☐
Link	☐	☑
Video	☐	☑
Insert	☑	☑
Serial	☐	☐

RUB XT

	Edit	Use
System	☑	☑
Keys	☑	☑
Read	☑	☑
LTC Read	☐	☑
D-VITC Read	☐	☑
ANC Read	☑	☑
Jam	☐	☐
Generate	☐	☑
LTC Generate	☐	☐
D-VITC Generate	☐	☐
ANC Generate	☐	☐
Link	☐	☑
Video	☐	☑
Insert	☑	☑
Serial	☐	☐

- 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 after the installation process. That avoids unintentional operating and malfunctions.

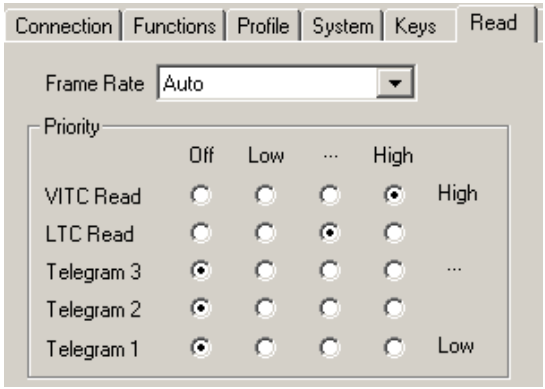
Step 3:

Configuration of the Reader

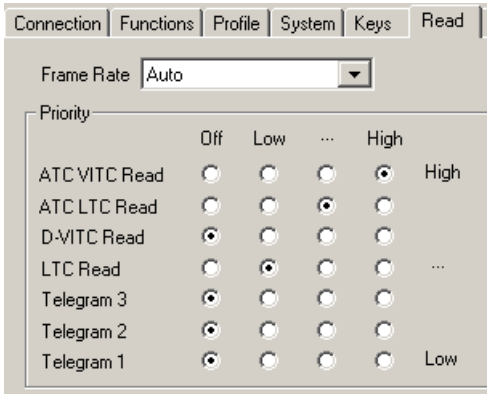
Activate the **Read** page.

Once you have selected your time code sources (step 2), now select which source should be taken into account for your time & date decoding. Telegram 1 – 3 are the three channels of the *TC_link* interface. If you have more than one source, select a ***Priority***:

RUB AT example

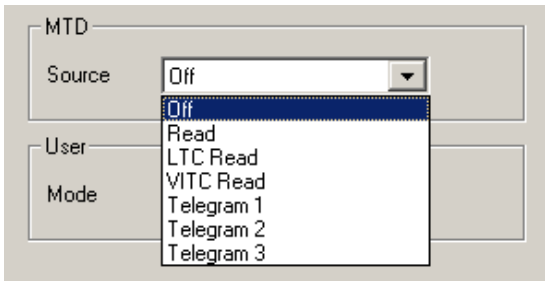


RUB XT example

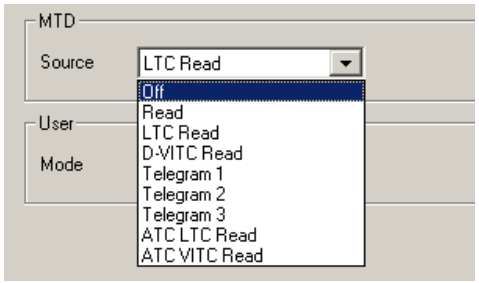


If the time code input is of the MTD format (= time code used for the Plura MTD Timer System, where the binary groups contain MTD data), then the source of this time code has to be selected from the ***MTD Source*** dropdown list. "*Read*" would be the preferred selection in this case. If no MTD decoding is required, select "*Off*".

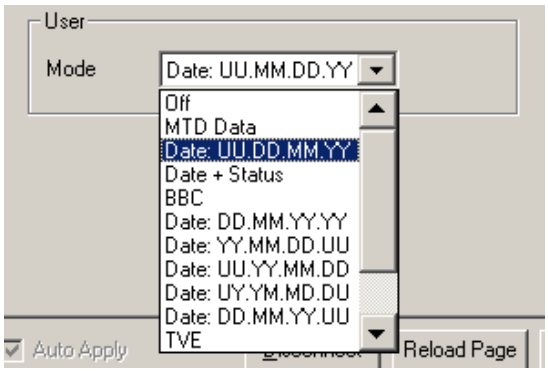
RUB AT example



RUB XT example



Select the date format from the ***User Mode*** dropdown list. This tells the module, which method the time code source is using to encode the date in the binary groups. Please refer to the appendix for the various formats presently available.



Step 4:

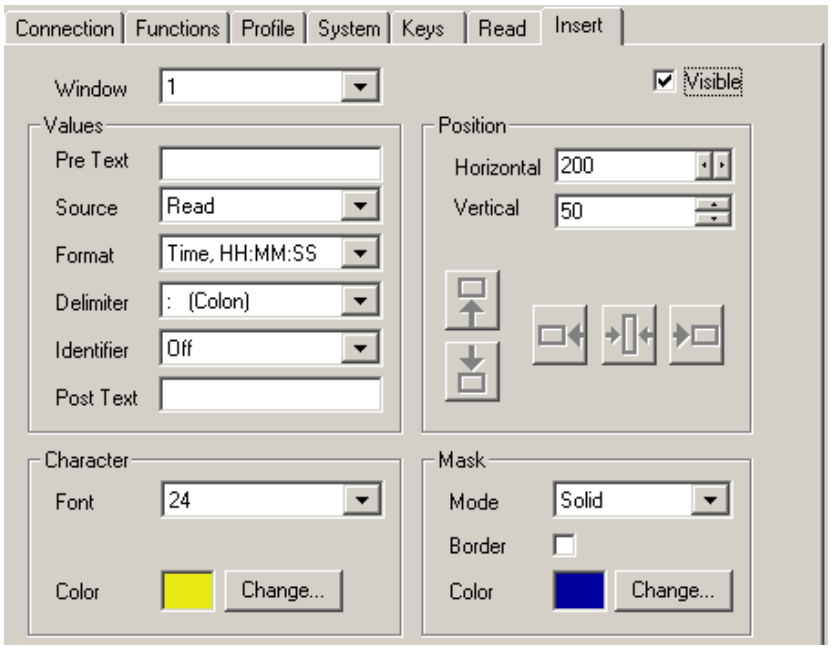
Configuration of the Inserter

Activate the **Insert** page and setup the video windows for time and date.

Example: Window 1 = Time:

Click the ***Visible*** checkbox. Select "***Source*** = Read".

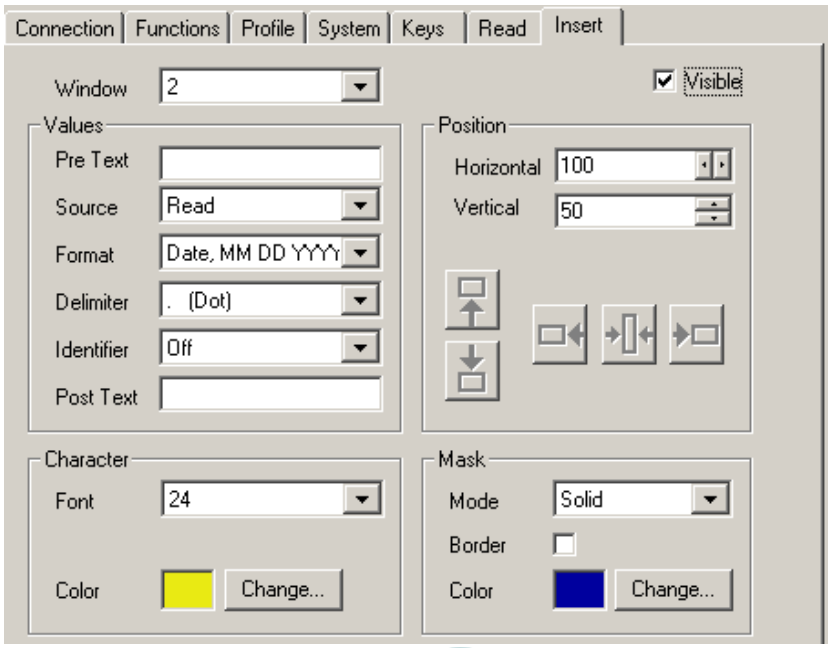
Select the representation of the time from the ***Format*** and ***Delimiter*** dropdown lists. Examples: HH:MM:SS:FF or HH:MM:SS or HH.MM.SS.FF or HH.MM.SS etc.



Example: Window 2 = Date:

Click the ***Visible*** checkbox. Select "***Source*** = Read".

Select the representation of the date from the ***Format*** and ***Delimiter*** dropdown lists. Examples: MM.DD.YYYY or DD.MM.YY or MM/DD/YYYY or DD/MM/YY etc.



Appendix:

Date Formats

The time code consists of eight four-bit groups containing time address and flag bits, and eight four-bit binary groups for user-defined data. The date can be encoded within these user-defined data.

The binary groups will be named BG1 to BG8. Displaying the data at an 8 digits display, there is the following correspondence to a time display:

Hours		Minutes		Seconds		Frames	
Tens	Units	Tens	Units	Tens	Units	Tens	Units
BG8	BG7	BG6	BG5	BG4	BG3	BG2	BG1

The list below uses the following abbreviations:

Y1000 = Thousands of year
Y100 = Hundreds of year
Y10 = Tens of year
Y1 = Units of year
M10 = Tens of month
M1 = Units of month
D10 = Tens of day
D1 = Units of day

Date Format	Description
MTD Data	Plura standard encoding time & date and MTD timer data.
AUXOFFS	LEITCH CSD-5300 format. Encoding the date corresponds to the BBC format.
BBC	All binary groups are used for the date, with a special format according to EBU Technical Information I29-1995 (BBC format). The date is BCD-coded and assigned to the binary groups as follows:

BG1	reserved	bits = 0
BG2	D1	4 bits, lsb = LTC bit 12
BG3	M1	4 bits, lsb = LTC bit 20
BG4	D10	2 bits, lsb = LTC bit 28
	M10	1 bit = LTC bit 30, LTC bit 31 = 0
BG5	reserved	bits = 0
BG6	Y1	4 bits, lsb = LTC bit 44
BG7	reserved	bits = 0
BG8	Y10	4 bits, lsb = LTC bit 60

TVE — Encoding the date:

BG8	BG7	BG6	BG5	BG4	BG3	BG2	BG1
CS	Y10	Y1	M10	M1	D10	D1	AC

BG1 = AC = Appointment code = $8
BG8 = CS = Check sum = Bit-wise complement of the sum (modulo-16) of BG1 to BG7.

SMPTE 309M: YYMMDD Date according to SMPTE 309M-1999: YYMMDD format.

SMPTE 309M: MJD Date according to SMPTE 309M-1999: Modified Julian Date format.

Further date formats, as selectable out of the ***User Mode*** dropdown list, are available.

U: This binary group contains user defined data with no importance for the date.

Format	BG8	BG7	BG6	BG5	BG4	BG3	BG2	BG1
UU.DD.MM.YY			D10	D1	M10	M1	Y10	Y1
Date + Status			D10	D1	M10	M1	Y10	Y1
DD.MM.YY.YY	D10	D1	M10	M1	Y1000	Y100	Y10	Y1
YY.MM.DD.UU	Y10	Y1	M10	M1	D10	D1		
UU.YY.MM.DD			Y10	Y1	M10	M1	D10	D1
UY.YM.MD.DU		Y10	Y1	M10	M1	D10	D1	
DD.MM.YY.UU	D10	D1	M10	M1	Y10	Y1		
MM.DD.YY.UU	M10	M1	D10	D1	Y10	Y1		
UU.MM.DD.YY			M10	M1	D10	D1	Y10	Y1

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