Option “M”

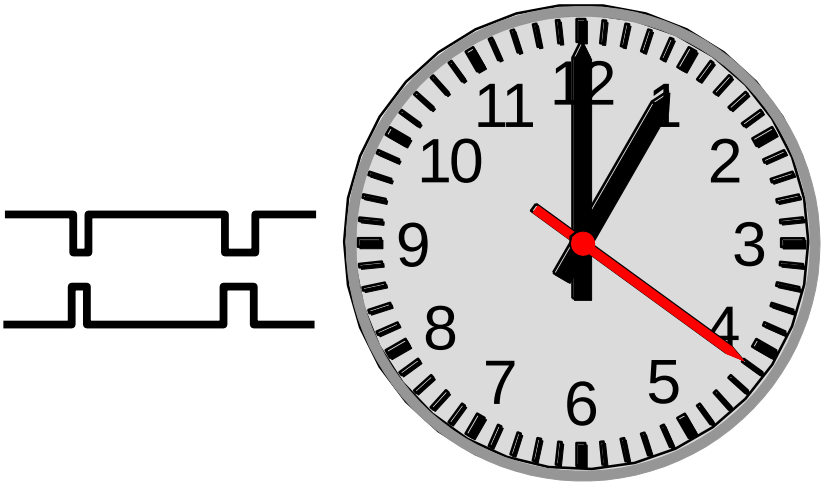
Version: 2.4

March 20, 2015

RUBIDIUM GT/GL/GI with “Master” Output

Impulse Telegram Output to Control Analogue Clocks

Supplement to the
“Functional Description & Specifications”
of Module RUB GT, RUB GL, or RUB GI



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A1 Revision History

No.	Date	Subject
1.0	November 22, 2007	First released document.
2.0	March 11, 2011	Maximum cable lengths of 2-wire interface revised.
2.1	March 25, 2011	Connecting SC Series clocks.
2.2	May 11, 2011	More information about cable lengths.
2.3	August 08, 2011	Option “M+”.
2.4	August 10, 2011	This option is applicable for GI modules as well.

A2 Copyright

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A3 General Remarks

This manual is a supplement to the “Functional Description & Specifications” of module RUB GT or RUB GL or RUB GI.

It describes a special function realized by an optional hardware.

1 General Description

With this option a built-in distribution amplifier supplies the analogue clocks of the *PLURA* system with power as well as with time data. The time data forms a telegram similar to the German radio time telegram DCF77. The data bits are transmitted every second except at second = 59. The time data are synchronous to the internal clock of the module.

Analogue clocks of the *PLURA* system can be equipped with a 4-wire interface (before year 2007) or with a 2-wire interface (starting with year 2007). This option offers the 2-wire interface.

This option is required if analogue clocks with a 2-wire interface should directly be controlled by the GT or GL or GI module, because there is no **VD** or **VL** module in the system.

Two variants are available: Option **M** and option **M+**. The **IMPULS TELEGRAM** output signal is wired to different connectors.

Option **M**: Suitable for a single GT/GL/GI module. Pin assignment at connector **GPI B** changes compared to the standard assignment; GPI A remains unchanged.

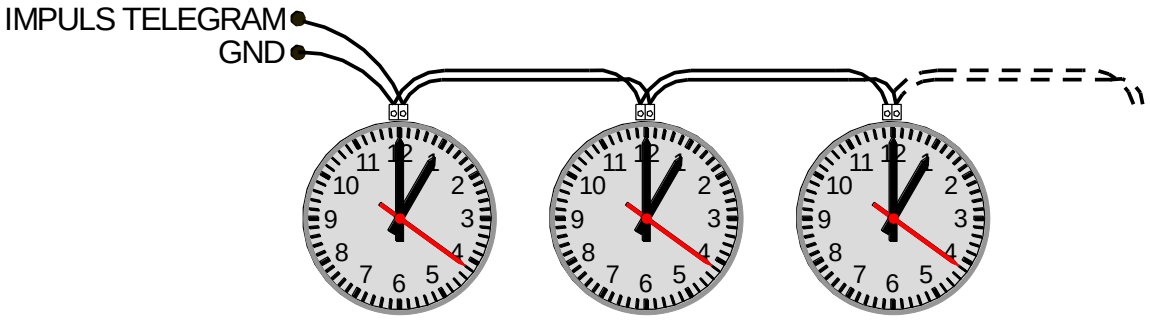
GPI B RJ45 jack	1: GPI_1 2: **IMPULS TELEGRAM** 3: REF_IN_A 6: REF_IN_B 4: **GND** 5: VCC24B_IN 7: LTC_IN_A 8: LTC_IN_B

Option **M+**: Suitable for a redundant GT/GL system with SL as changeover module, or GI system with SI as changeover module. Pin assignments basically remain unchanged. The “TELEGRAM OUT” signal changes to “IMPULS TELEGRAM” with different electrical specifications. This signal can be switched via the changeover module; there it is available with identical pin assignment.

MTD (GT/GL) LTC/MTD OUT (SL)	DSUB9F / RJ45	IRIG (GI) IRIG OUT (SI)	DSUB9F / RJ45
RS485 TRA	1 / 1	RS422 TA-	1 / 1
RS485 TRB	2 / 2	RS422 TB+	2 / 2
LTC_OUT_A	3 / 3	IRIG_OUT_A	3 / 3
LTC_OUT_B	4 / 6	IRIG_OUT_B	4 / 6
GND	5 / 4	**GND**	5 / 4
-	6	-	6

(DRVSEL)	7 / 5	(DRVSEL)	7 / 5
SERIAL OUT	8 / 7	SERIAL OUT	8 / 7
IMPULS TELEGRAM	9 / 8	**IMPULS TELEGRAM**	9 / 8

2 Analogue Clocks with 2-Wire Interface

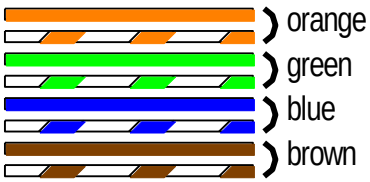


The following specifications are not applicable to SC Series clocks! Please read next chapter.

A maximum of 12 clocks can be connected to guarantee a faultless operation over the whole specified temperature range. The following table shows standard values of maximum cable length calculated for a typical copper material:

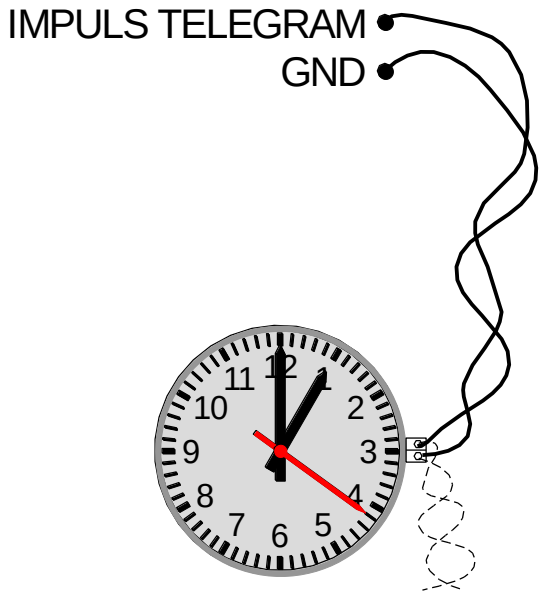
Cross section [mm²]	0.141 Example: AWG26-7/34	0.205 Example: AWG24 solid bar	0.324 Example: AWG22 solid bar	0.519 Example: AWG20 solid bar
Length [m] 12 clocks	275	400	630	830
Length [m] 10 clocks	350	510	800	1060
Length [m] 8 clocks	460	670	1070	1410
Length [m] 6 clocks	650	950	1500	1980

CAT (network) cables contain four pairs of wires. The wires of a pair are twisted together. The wires could conform to AWG24 or AWG26. It is possible to enlarge the cross section or to reduce the number of clocks per line by using several pairs of the cable. A pair can be identified by the colour: Solid colour wire + white and colour striped wire.



The 2-wire interface requires IMPULS TELEGRAM with **negative-going** pulses – see chapter configuration.

3 Connecting SC Series Clocks

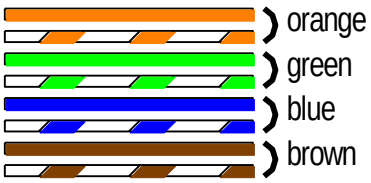


This output stage is capable of driving **two** studio clocks. The GT/GL/GI module must receive power from a **24 VDC** power supply.

It is recommended not to exceed the following cable lengths dependent on the number of studio clocks (1 or 2) connected:

Cross section [mm^2]	type of wire	length [m]	
		1 Clock	2 Clocks
0.205	AWG24 solid bar	165	45
0.280	J-Y(ST)Y ..x2x0.6	225	60
0.324	AWG22 solid bar	260	70
0.500	J-Y(ST)Y ..x2x0.8	410	100
0.519	AWG20 solid bar	430	110

Note: Network CAT5 cables use AWG24 or AWG26 wires, please check. It is not recommended to use conductors with cross sections less than 0.2 mm^2 (AWG24/1). AWG26-7/34 wires have a cross section of 0.141 mm^2. CAT cables contain four pairs of wires. The wires of a pair are twisted together. It is possible to enlarge the cross section or to reduce the number of clocks per line by using several pairs of the cable. A pair can be identified by the colour: Solid colour wire + white and colour striped wire.

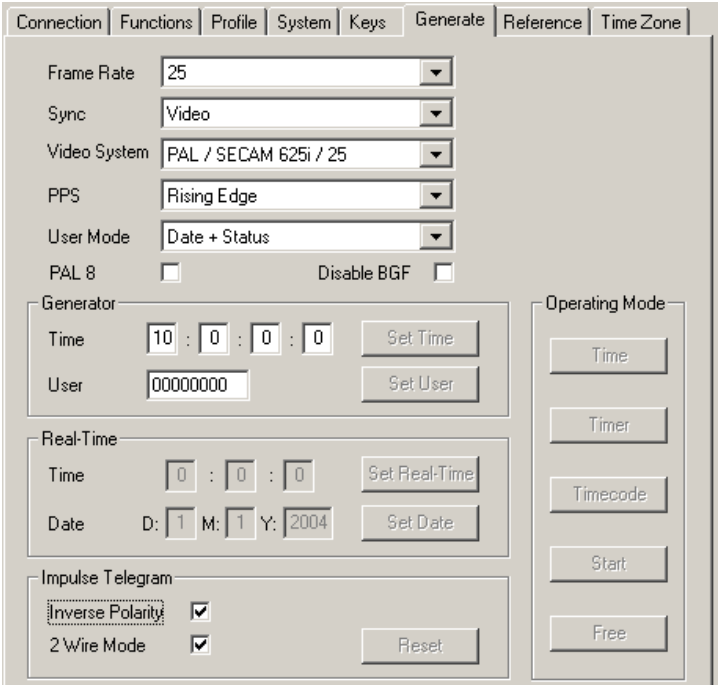


The 2-wire interface requires TELEGRAM OUT with **negative-going** pulses – see chapter configuration.

4 Configuration

The PC program “RUBIDIUM CONFIGURATION“ or the RUBIDIUM SERIES HTTP-Server enables you to find the configuration for your special environment.

At the **Generate** page of your configuration tool the impulse output gets the set-up according to the 2-wire interface:

Inverse Polarity: **checked** **2 Wire Mode:** **checked**	

The analogue clocks display the time of the local time zone. This corresponds to the “Local Time Zone” selected at the **Time Zone** page:

Local Time Zone