

RUBIDIUM GT + Option A: Controlling the MTD Timers by an Automation System

Supplement to the "Functional Description & Specifications" Manual of Module GT

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A1 Revision History

No.	Date	Subject
1	December 14, 2007	First released document.
2	September 23, 2008	Two versions: "OPT42" and "OPT43".
2	May 08, 2009	Revised.
3	June 19, 2009	New variant: "OPT47". Completely revised.
4	October 05, 2009	Chapter "The MTD Timer System" added.
5	October 12, 2011	New variants: "OPT62" and "OPT63".

A2 Copyright

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A3 General Remarks

This manual is a supplement to the "Functional Description & Specifications" of module GT.

It describes a special function of the GT module realized by an optional firmware and perhaps by a modified hardware.

A module with this special option may have not all the functions as there are in a standard module.

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1 Functional Description

"Option A" for a RUBIDIUM GT Module has been developed to enable remote control of MTD stop timers. The GT module receives timer data via one or more serial interfaces. These timer data can be assigned to any MTD timer. The RS485 of the MTD system used for manual controlling the MTD timer will still be available without constraints. So each MTD timer now can be controlled manually or automatically:

- Manually: connecting a MTD control unit to the GT using the RS485 serial interface.
- Automatically: connecting an Automation System to the GT using the serial interfaces of this option.

The protocols used for an automatic control are available on request.

The following variants are available:

Variant	Serial inputs	Hardware Modification	Remarks
OPT42	SER1 at REF IN.2 [RXD IN] SER2 at REF IN.1 [PPS IN]	No	No standard time & date reference (GPS, DCF77) can be connected, so this option includes option "L" for external LTC time & date reference. GPI_1 and GPI_2 available.
OPT43	SER1 at GPI A/B.1 [GPI_1]	Yes	The standard time & date reference (GPS, DCF77) available. GPI_2 available.
OPT47	SER1 at GPI A/B.1 [GPI_1] SER2 at GPI A/B.2 [GPI_2]	Yes	The standard time & date reference (GPS, DCF77) available. No GPI available. SERIAL OUT at MTD connectors no longer available (pin 8 at DSUB and pin 7 at RJ45).
OPT62	SER1 at REF IN.2 [RXD IN] SER2 at REF IN.1 [PPS IN] SER3 at GPI A/B.1 [GPI_1]	Yes	No standard time & date reference (GPS, DCF77) can be connected, so this option includes option "L" for external LTC time & date reference. GPI_2 available.
OPT63	SER1 at REF IN.2 [RXD IN] SER2 at REF IN.1 [PPS IN] SER3 at GPI A/B.1 [GPI_1] SER4 at GPI A/B.2 [GPI_2]	Yes	No standard time & date reference (GPS, DCF77) can be connected, so this option includes option "L" for external LTC time & date reference. No GPI available. SERIAL OUT at MTD connectors no longer available (pin 8 at DSUB and pin 7 at RJ45).

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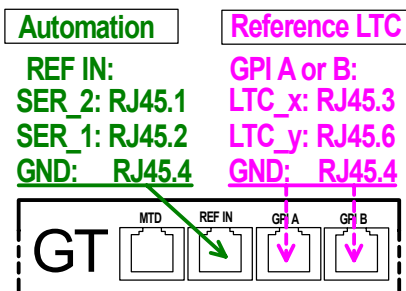
2 Connections

The serial interfaces provide inputs for an asymmetrical data transfer with RS232 polarity, for example a RS232 interface can be connected. RS422 interfaces have to be converted to RS232.

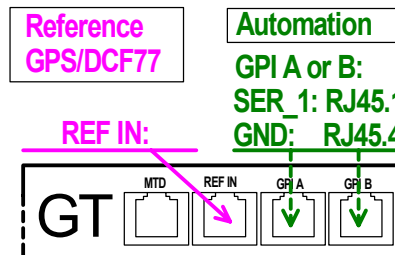
The input specifications confirm to the standard module, details are given in the "Functional Description & Specifications" manual of module GT (see GPI specification of inputs PPS IN and RXD IN). If GPI pins are used as serial input, they will be modified to meet the specification of inputs PPS IN/RXD IN).

The interfaces are unidirectional, without handshake lines. The GT module acts only as a receiver, no return will be given.

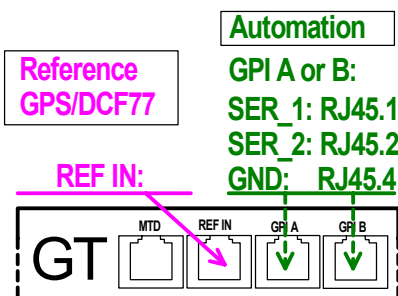
Variant "OPT42"



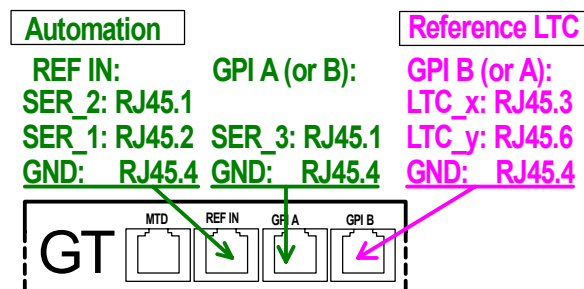
Variant "OPT43"



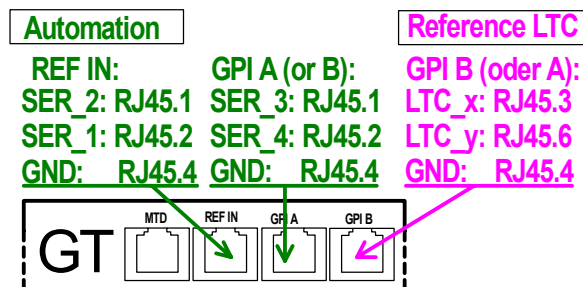
Variant "OPT47"



Variant "OPT62"



Variant "OPT63"



3 Configuration

Open the **Automation** tab to verify or change all parameters of the Automation interface:

The screenshot shows a software configuration window with several tabs: Connection, Functions, Profile, System, Keys, and Generate. The 'Automation' tab is selected. Below the tabs are three main sections: 'Automation', 'Serial Interface', and 'Timer'.
- The 'Automation' section contains: 'Enable' (checked), 'Allow manual control' (unchecked), and 'Address Offset' (four dropdown menus with values 0, 1, 2, 3).
- The 'Serial Interface' section contains: 'Baudrate' (38400), 'Data Bits' (7), and 'Parity' (Even).
- The 'Timer' section contains a table with columns A through F and rows for 'Automation Control', 'Disable Down Offset', 'Delay Compensation', and 'Timer Mode'.
- 'Automation Control' row: A, B, C, D are checked; E, F are unchecked.
- 'Disable Down Offset' row: All are unchecked.
- 'Delay Compensation' row: A, B, C, D are 1; E, F are 0.
- 'Timer Mode' row: All are L.

Automation

Enable	Check this box to enable remote control in general. If this checkbox is unchecked, all MTD timers can be operated manually only, regardless of selection at "Automation Control".
Allow manual control	Check this box to allow manual control of the timers in parallel to automation control. If this checkbox is unchecked, all MTD timers enabled for automation control cannot be controlled manually by any operational unit.
Address Offset	<p>The implemented protocols include an address or number. Address or number 1 is assigned to MTD timer A, 2 to timer B, and so on until 6 to timer F. Setting an address offset this allocation can be altered. Example with offset = 3: A command with address 1 now controls timer D instead of timer A.</p> <p>Depending on the option there are one or two or three or four interface installed. Each serial input can get its own address offset. Please refer to chapter "Configuration in case of several serial interfaces" as well.</p>

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Serial Interface

Adjust the serial interface parameters, valid for all serial inputs in common.

Timer

The following set-up has to be selected for each of the MTD timers (A, B, C, D, E, F) separately.

Automation Control Switches on or off the automatic control for this individual timer.

Disable Down Offset MTD displays add an offset in case of a down-counting time. To undo this behaviour activate this check box. For your application please compare the counting of a down-counting time of the MTD timer with the original time. If there is a one second difference, you can correct this by changing this parameter.

Delay Compensation The serial data transfer may cause a delay. This can be compensated in the range of 0 – 7 frames. For your application please compare the counting of the seconds of the MTD timer with the original time. If there is no exact match, you can correct this by setting this parameter.

Timer Mode

Operating with any MTD control unit (manually) offers you a wide range of features. The "Timer Mode" selection enables you to use some of these features during an automatic control.

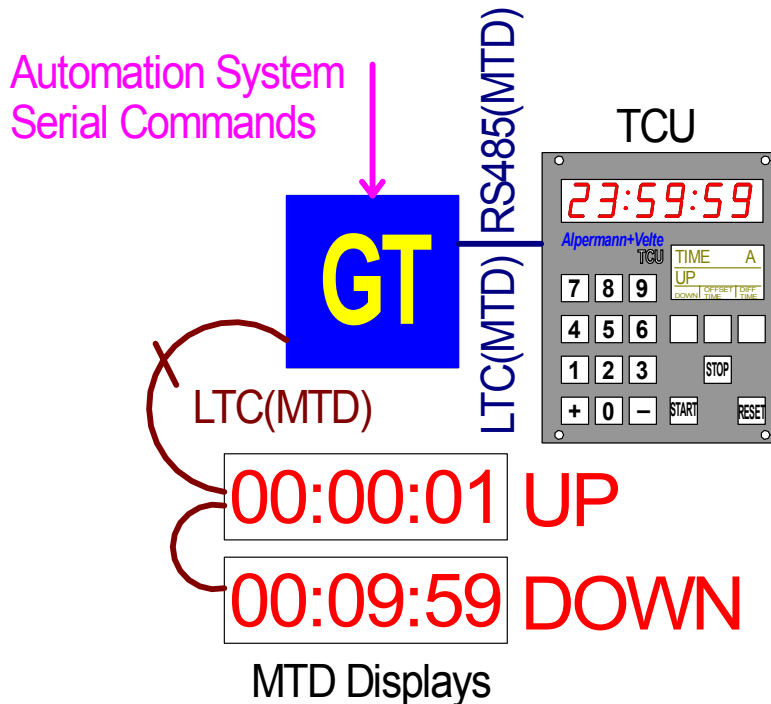
N The automation system uses the "N" protocol (e. g. AVECO automation). With this operating mode a MTD timer can display an up-counting, a down-counting or a still time. It is not possible to use any of the special timer combination function like DUE.

L The automation system uses the "Modified Harris/Louth" protocol. With this operating mode a MTD timer can display an up-counting, a down-counting or a still time. It is not possible to use any of the special timer combination function like DUE.

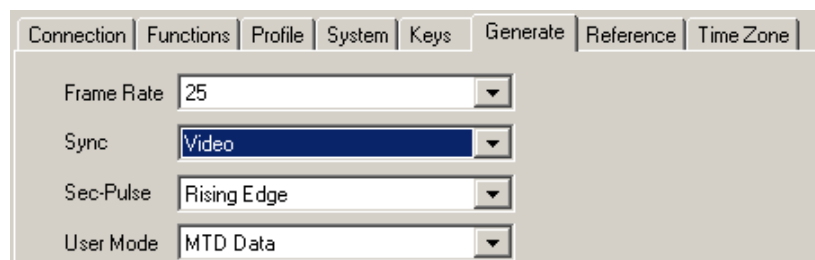
D The automation system uses the "Modified Harris/Louth" protocol – restricted to DOWN applications. With this operating mode the timer is suggested to be in a down-counting mode only. In this case the corresponding timer will be set to the MTD special timer combination function DUE (Down/Up/End).

4 The MTD Timer System

The diagram shows a minimum constellation of a timer system:



The RUB GT module receives the commands from the Automation System and generates the LTC(MTD). This type of time code carries all the different timers of the MTD timer system. Please make sure that "User Mode = MTD Data" has been selected at GT configuration:



MTD Displays receive the LTC(MTD). At UD Displays please select:

"Source = LTC(MTD)"

and select the Timer to be shown at the display.

The TCU Timer Control Unit may optionally be used to manually control the timers. The TCU needs LTC(MTD) and RS485(MTD) connection.

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5 Controlling via TCU

There are new status information at the OLED display and new functions for the programmable keys.



The '*' next to the character which identifies the MTD timer indicates that the automation control has been enabled for this timer (individual and general). This timer cannot be controlled manually unless the check box "Allow manual control" has been checked.

TCU offers two new functions to switch on/off the automatic control:

Function **AUTOMATION** (code 86): Switches on/off the automatic control only for this individual timer. This corresponds to the 'Automation Control' check box – see chapter "Configuration". The lamp of the key lights up if the automatic control has been enabled individual and general.

Function **AUTOM ENABLE** (code 87): Switches on/off the automatic control only in general. This corresponds to the 'Enable' check box – see chapter "Configuration". The lamp of the key lights up if the automatic control has been enabled general.

6 Remarks to the Serial Control

6.1 Protocols

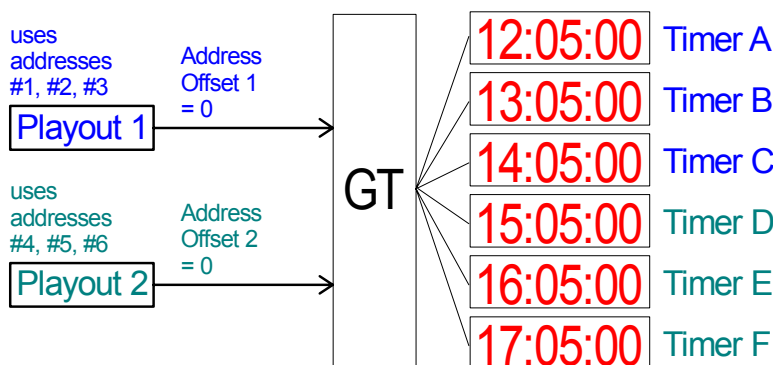
The protocols used for an automatic control are available on request.

6.2 Configuration in case of several Serial Interfaces

Some variants allow receiving commands from more than one external source at the same time.

The implemented protocols include an address or number. Address or number #1 basically is assigned to MTD timer A, #2 to timer B, and so on until #6 to timer F. Setting an **Address Offset** this allocation can be altered. A possible application for example would be in case of two sources which are able to address numbers #1, #2 or #3 only, but different MTD timers should be controlled.

Example: Controlling MTD timers A – F without an address offset



Example: Controlling MTD timers A – F using an address offset

