



## **MGB-Tech**

Sint Ursmarusstraat 180  
B-9200 Baasrode  
Belgium

Tel +32 52 37 5960  
Fax +32 52 37 5963  
[www.mgb-tech.com](http://www.mgb-tech.com)

# **Radio Tide Receiver Station**

## **MTU821-DRO**

### **Operation Manual Version 1.1**

## **Introduction**

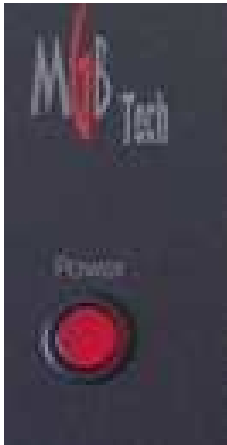
MGB-Tech's MTU821-DRO is a receive-only version of the MTU Radio Tide Station range of products.

The MTU821-DRO is built in 19-inch case (3HE high, 84 TE wide) and is designed for desktop or rack-mount use

Up to ten transmitters may share the same radio channel: they are identified by their 'Radio Code' which is transmitted together with the tide message.

Our MTU821-DRO Tide Receiver has the capability to simultaneously display the tide of four Transmitter Stations in range.

## MTU821 Panel Operation



### ON/OFF pushbutton with maintained action:

Push once to switch the instrument ON.  
Push again to switch OFF.

ON status is indicated by the LED integrated in the pushbutton

#### Important:

This switch commands logic circuitry only. The AC power supply remains operational. Make sure to remove the AC Power Lead before opening the instrument case.



### LCD display Intensity & Contrast Controls:

The 'Intensity' control adjusts the intensity of the LED backlight integrated in the LCD display. This potentiometer has no effect when the backlight is switched OFF.

#### Note:

*Pushing any of the cursor or selection keys or rotating the digital panel control will make automatically the LCD backlight switch to ON*

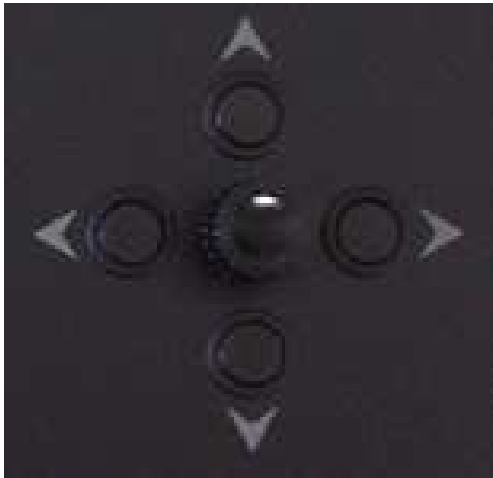
The 'Contrast' potentiometer adjust the readability of the LCD display.

The contrast is influenced by temperature variation but also varies with the 'viewing angle'.



### Selection keys:

<ESC>	Push the ESCAPE button to step-up one level in the menu tree or to return to the operation screen
<MENU>	Pushing this key activates the menu
<ENTER>	Use this pushbutton to confirm your selection(s)
<ALPHA>	The MTU821 accepts alpha-numerical entries. Use this pushbutton to switch between letters or figures entry.
<Funct>	This is a function key.

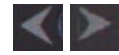


#### Cursor keys:



UP/DOWN cursor keys

Use these keys to scroll the menu or to jump to scroll to other selections fields above or below the current one



LEFT/RIGHT cursor keys

The keys are used to scroll between horizontally spaced fields or to ease entry of large numbers



#### Digital Panel Control:

The Digital Panel Control may be used for UP/DOWN scrolling in addition to the cursor keys, but it also make entry of letters and figures possible: press the ALPHA key to switch from letters to figures and vice versa and rotate the Digital Panel Control until the required letter or figure appears on the screen.

The Digital Panel Control is also used when entering operational parameters, like Baud Rate, Averaging Interval interval, etc. Every click of the Digital Panel Control will make the parameter value increase or decrease one step at the time.

When large variations are required, the Digital Panel Control may be used in combination with the LEFT/RIGHT cursor keys: pushing the RIGHT cursor key will increase the parameter value by a number of units, pushing the LEFT key will decrease it by a number of units at the time.

Assume the actual Averaging Interval =1.

Every clockwise click on the Digital Panel Control will increase the Averaging Interval by one while every counter-clockwise click will decrease the Averaging Interval by one.

On the contrary, every push on the RIGHT cursor key steps makes the Averaging Interval increase by 100. The LEFT cursor key will behave the same way, but to lower the Averaging Interval by 100 at the time.

## **Context sensitive help**

The LCD display informs the operator what to do when entering operation parameters. E.g., following message is put on the LCD screen when entering the Averaging Interval:

```
Scroll between 1 and 900 seconds.  
Use Left & Right arrow keys to scroll  
with stepsize 100.
```

Other example:

*When modifying the serial communication speed:*

```
Select the serial line baudrate. You  
can use a log dump to test the serial  
line if this value is changed.
```

## Menu tree

Tide View Page	→	(Return to main screen)	
View Logged Data		LogMenu	→ Mark Begin
			→ Mark End
			→ Dump Range
			→ Reset Index
			→ Goto Home
			→ Goto #0
		Scroll	
		Step	
Select Radio Channel	→	Select Radio Channel: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 <OK> <CANCEL>	
Select Station	→	Select Primary Sation/Transmission Station A B C D E F G H I J <OK> <CANCEL>	
General Config	→	Logging Interval	→ (1 to 900)
		Averaging Interval	→ (1 to 900)
		Baud rate	→ (1200 to 115200 bps)
		Serial Format	→ (A/B/C)
		Auto Backlighting	→ (Enabled/Disabled)

Set Date/Time			
Station List			
Diagnostics		An. Output Check	
		RS232 Check	
		Atmospheric Pressure Check	
		Cancel	
Aboutbox...			

**Very important:**  
 Press the <ENTER> key when leaving a submenu, otherwise all selection changes will be discarded.

## What after powering ON? - Common Settings

*Do not forget to connect the antenna before switching on the Radio Tide Station!*

The equipment becomes alive by pushing the Power ON switch. The red LED indicator starts glowing and the LCD display shows the welcome screen.

Adjust contrast and backlight intensity until you feel comfortable with the readability. Meanwhile, the LCD display has jumped to the 'Main Operation Screen'.

### Radio Tide Station Receiver

Now set the operation parameters Push the MENU button

- Select '**Set Date/Time**' and adjust the real time clock if necessary
- Scroll now to the menu item '**Select Radio Channel**' and choose the radio channel in use on the site: our Tide Stations use the same frequency for transmission and for reception, so if channel 2 is used by the Radio Tide Transmitter Station, the same channel must selected at each Radio Tide Receiver station that needs tide information from that particular transmitting station.
- Do not forget that up to ten Radio Tide Transmitter Stations and an unlimited number of Radio Tide Receiver Stations may share the same channel.

The '**Select Station**' permits to select a radio code (A,B, C, ..., or J) for a particular transmitter.

The 'Radio Code' parameter makes it possible to distinguish between the Radio Tide Transmitter Stations active on the same radio channel. At the receiver side, the '**Select Station**' menu is used to select the radio code of the 'Primary Station': this must be the radio code used by the most important Radio Tide Transmitter Station on your site.

It is also possible to receive other Radio Tide Transmitter Station active on the same radio channel. See the receiver section for more information on this subject.

- Next step is to select the '*General Config*' menu:

**Logging Interval:**

Sets the interval between two successive writing operations to the internal memory.  
 The logged information is date, time, radio code and tide of the primary received station  
 The shortest interval is one second, the longest is 900s.

**Averaging Interval:**

Defines how many samples are used to calculate an average.  
 The minimum is one, the maximum 900.  
 We advise to use averaging only at the transmitter and to set this parameter to 1 at the receiver.

**Baud rate:**

A serial port is available at the back panel of the MTU821-D-VT or at the left side of the MTU821-W-VT. The label is 'RS232 Serial Port'. This port may be used to send received tide information to an external device in format A, B or C (see below).  
 The same port is used to dump the logged data. The MTU supports high data rates, so dump time can be shortened dramatically.  
 Supported baud rates are 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 baud.

**Serial Format:**

The serial format is A, B, or C:  
 The MTU821-DRO sends tide information regarding the primary station to the serial port (format A and B) and tide information about both primary and secondary stations when format C is selected.

**Output format A:**

The MTU821 'Radio Tide Receiving Station' serial output consists of the radio code and tide.

**A+05.43<CR><LF>**

**Output format B:**

The MTU receiver serial output is data& time, followed by radio code and tide.

**08/01/98 17:40:12 A+05.43<CR><LF>**

**Output format C:**

The last received tide of primary and secondary stations is sent to the serial port.  
 This mode is only available in 'Radio Tide Receiver Station'.

**Auto Backlighting Enabled/Disabled**

When Enabled, the LCD backlight is automatically shut-off when no panel operation was detected during some time. Rotating the panel control or pushing one of the panel keys will immediately result in backlight ON again.

## **MTU821-DRO Radio Tide Receiver – Receiving Tide Information from Radio Tide Transmitting Stations.**

Several 'Radio Tide Transmitter Stations' may be active on the same channel (frequency) on condition each of them is allocated a different 'Radio Code'.

The 'Radio Tide Receiver Station' uses this 'Radio Code' to distinguish between the received transmitter stations.

### **Primary Station**

Not all Radio Tide Transmitting Stations sharing the same frequency are of equal importance for the navigating vessel. The most important station will be selected as '*Primary Station*'.

This is done in the 'Select Station' Menu.

The primary station's tide information is displayed in large font on the LCD display.

### **Secondary Stations**

Information of other Radio Tide Transmitting Stations may be useful, and it is handy for a navigating vessel to check if a particular transmitter station comes in range.

Up to four Radio Tide Transmitting Stations can be selected as 'Secondary Stations'.

The information received from secondary stations is displayed in small font on the LCD.

Go to the 'Station List' menu to get the list of transmitter stations. Set the parameter 'Show' to YES for those stations selected as secondary station.

### **Same transmitter station as primary as well as secondary station**

It is allowed to select the same Radio Tide Transmitter Station (same 'Radio Code') as primary station as well as secondary station. This may be useful, because more stringent tests are performed on information received from a primary station. In fringe areas, the secondary station information may be quicker available on the display than information received from the same station but handled as primary station.

### **Age of data**

An 'Age of Data' check is performed on messages received from *ALL* Radio Tide Transmitter Stations (either primary, secondary, or not selected).

Tide information will be erased when no fresh information is received from a particular transmitter station within the 'Age of Date' time span.

Go to the 'Station List' menu to get the list of transmitter stations. Select the required 'Age of Data' in the 'Life' column.

Available selections are 1 to 90 seconds and 2 to 60 minutes.

The default value is 60 s.

Note that the 'Age of Date' parameter selected in this menu applies to both the primary and secondary station with the same 'Radio Code'.

### **Averaging Interval**

Normally, average calculation will be performed by the 'Radio Tide Transmitter Station'. This is always the case with our MTU821 Radio Tide Stations.

If the transmitter station doesn't provide this facility, then average calculation may be done at the receiver side.

Go to the 'Station List' menu to get the list of transmitter stations. Go to the 'Average' column and set the selection box to 'YES' for those stations needing average calculation at the receiver side.

The default setting for all stations is NO.

### **Voltage information**

MTU821-D-VT and MTY821-W-VT Radio Tide Transmitter Stations offer the possibility to transmit the supply voltage of the data-acquisition board inside the MTU, together with the tide information:

- Received voltage between 14.6 and 15.2 VDC: the transmitter station is operation on the AC mains supply.
- Received voltage between 12.8 and 14.5 VDC: the transmitter station operates on battery power and is charged by solar energy.
- Received voltage below 12.8 VDC: the transmitter station operates on battery power. No charging from solar power when the received voltage remains decreasing. When the received voltage increases slowly, then the battery is charged by solar power but the battery has been deeply discharged.

#### Notes:

A watchdog circuit will shut-off the Radio Tide Station when battery voltage becomes too low.

It is not possible to check the battery status at the receiver side when for transmitter stations operating on AC power.

## **Diagnostics Menu.**

### **Radio RX Check**

For service purposes only

### **RS232 Check**

Shows the messages sent by the MTU821 to the RS232 serial port.

## Hardware.

### Hardware set-up

The MTU821-DRO consists of 5 modules:

1. AM61AD Acquisition board AM61AD
2. Communication module with LDC display, processor board and communication interface
3. Power source selector board
4. Synthesized UHF Radio (transmitter/receiver)
5. Switched-mode power supply unit, 176-264 VAC/47-63 Hz

### Connectors

The connectors on the MTU821-DRO are located at the back panel of the 19-inch case.

Label	Pin	Function	Mating Connector or lead color
MAINS 85-264 VAC, 47-63 Hz	L	AC (hot)	Schuko AC Mains Plug
	N	ACC (cold or neutral)	
	E	Earth	
DC INPUT 12-15 VDC (option)	+	Positive terminal	Brown (+)
	-	Negative terminal	Blue (-)
RS232 SERIAL PORT	1	Signal Ground	9-pos. female sub-D. cable connector ( <b>DCE</b> configuration) Connects 1/1 to male serial port connector on PC ( <b>PC=DTE</b> ) Pin 5 (SG)
	2	Data Out	Pin 2 (RxD)
	3	Data In (to MTU)	Pin 3 (TxD)
	4	Handshake Input	Pin 4 (DTR)
	5	Handshake Output	Pin 8 (CTS)
	6	N.C.	--
ANALOG OUTPUT (option)	1	Live terminal	Brown (+)
	2	Analog ground	Blue (-)