GPIO Interface of SATEL Serial Radio Modules

The information below applies to the following radio modules:

- SATEL-TR4+
- SATEL-TR300
- SATEL-TR489
- SATEL-TR49
- SATEL-TR49 SnapOn
- SATELLINE-M3-TR9

GPIO (General Purpose Input Output) interface has been designed in order to improve the control signalling between the radio module and data terminal equipment (DTE).

GPIO interface contains eight user configurable lines (three inputs and five outputs). Each line can be assigned an applicable GPIO Mode listed on the table below.

NOTE: GPIO1…GPIO4 lines may have a configuration for other usages (Serial Port2 functions) that are mutually exclusive from GPIO modes described in this document. Therefore, it is recommended to prefer using GPIO5, GPIO 6, GPIO7 and GPIO8 lines.

GPIO Modes

Currently supported (status according FW version 07.xx.2.5.1.4) GPIO Modes are listed in the table below. The types "OUT" are for the output lines. The types "IN" apply to input lines.

GPIO Mode	Name	Description	Type
0	OFF	Default state (LOW state for output lines and HIGH state for input lines, due to internal pulling circuits)	IN/OUT
1	Radio Link Indicator (blink mode)	Indicates when radio transmitter or receiver is active in data transmission. GPIO line is HIGH if the transmitter is on or the receiver has detected a signal -90 dBm or stronger. *Note.* Minimum duration of HIGH state = 200 ms GPIO line blinks HIGH-LOW-HIGH-etc.-LOW if the receiver has detected a signal weaker than -90 dBm. *Note.* Minimum duration of HIGH state = 200 ms. The blinking is practically applicable only when the duration of a reception exceeds about 600ms i.e. the size of the received message is adequate. GPIO line is LOW if the transmitter is off and the receiver is not detecting any signal.	OUT
2	Serial Data Indicator	Indicates activity at serial interface (TD and RD lines) by alternating GPIO line status (HIGH-LOW-HIGH-LOW) at 200 ms intervals. If there is no data transmitted nor received through the serial interface, GPIO line stays low.	OUT
3	Radio Link Indicator	Indicates when radio transmitter or receiver is active in data transmission. GPIO line is HIGH when the transmitter is on (i.e. transmitting data) or the receiver is detecting signal.	OUT
4	Error Indicator	Reserved for special purposes	OUT
5	Power Indicator	GPIO line is HIGH while the radio module is powered and enabled	OUT

6	Radio Status Indicator	Reserved for special purposes	OUT
7	TxStatus-HighActive	GPIO line is HIGH when the transmitter is ON, otherwise LOW	OUT
8	TxStatus-LowActive	GPIO line is LOW when the transmitter is ON, otherwise HIGH	OUT
9	ON	GPIO line is in fixed HIGH state	OUT
10	GPIO Mode 10	Reserved for special purposes	OUT
11	GPIO Mode 11	Reserved for special purposes	OUT
12	RSSI High	GPIO line is HIGH if RSSI signal is **above** the set threshold value	OUT
13	RSSI Low	GPIO line is HIGH if RSSI signal is **below** the set threshold value	OUT

Configuration of GPIO Interface

GPIO interface can be configured by using:

- SATEL Configuration Manager software
- SATEL SL commands

SATEL Configuration Manager software (starting from version 1.11.2)

Browse >***Modem Settings*** >***Misc settings*** and then ***GPIO*** section to configure GPIO lines.
Please contact SATEL for your copy of the latest software.

SATEL SL Commands

Format of SL%X= (Set GPIO functions) command:

SL%X=<GPIO_Number>,<GPIO_Type>,<GPIO_Mode><CR>
<GPIO_Number> specifies GPIO line to be configured (e.g. 8 = GPIO8)
<GPIO_Type> is type of GPIO line (0=input, 1=output)
<GPIO_Mode> is number of GPIO mode for the line (see the table above)
<CR> Carriage Return character

Response is OK or ERROR.

Format of SL%X? (Get GPIO functions) command:

SL%X?<GPIO_Number>
<GPIO_Number> specifies GPIO line (e.g. 8 = GPIO8)

Response is:

<GPIO_Status>,<GPIO_Type >,<GPIO_Mode> of the requested GPIO
<GPIO_Status> indicates the current status of GPIO line (0=LOW, 1=HIGH)
<GPIO_Type> Type of GPIO line (0=input, 1=output)
<GPIO_Mode> is number of GPIO mode configured for the line (see the table above)

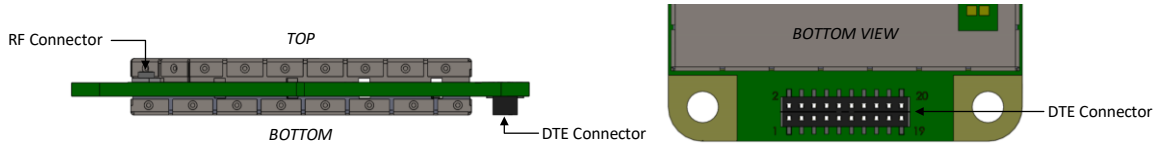
Please refer to the user guide of a radio module for general information how to use SL commands.

Note! Radio module responds with an error message if a non-applicable type of GPIO Mode is tried to be configured to the GPIO line.

Tip: SL commands can be tested by using Saterm terminal software. SL command is written to the Transmit window and thus sent to the radio module as a contiguous data message.

Physical/Electrical GPIO Interface

Eight pins of the 20-pin DTE connector (two-row 1.27 mm pitch socket) are dedicated for the GPIO lines.



Pin Order of GPIO Interface in DTE Connector

Pin No. of DTE connector	Signal Name	Direction	Type	Function	Applicable GPIO Modes
1, 2	VCC_IN	IN	POWER, external voltage	DC input	-
3, 4	GND	-	GND, external ground	Ground reference for power and signals	-
5	VCC_IO	IN	POWER, external voltage	Supply voltage for IO lines	-
6	ENA_MOD	IN	IO, internal pull-down	Module ENA pin	-
7	RD1	OUT	HCMOS, output driver	Receive data, active low	-
8	CTS1	OUT	HCMOS, output driver	Clear to send, active low	-
9	TD1	IN	HCMOS, internal pull-up	Transmit data, active low	-
10	RTS1	IN	HCMOS, internal pull-up	Request to send, active low	-
11	**GPIO1 (RD2)**	**OUT**	**HCMOS, internal pull-down**	**User configurable**	**0-13**
12	**GPIO2* (CTS2)**	**OUT**	**HCMOS, internal pull-down**	**User configurable**	**0-13**
13	**GPIO3 (TD2)**	**IN**	**HCMOS, internal pull-up**	**User configurable**	**0**
14	**GPIO4 (RTS)**	**IN**	**HCMOS, internal pull-up**	**User configurable**	**0**
15	STAT	OUT	HCMOS, output driver	Various sequences	-
16	**GPIO5**	**IN**	**HCMOS, internal pull-up**	**User configurable**	**0**
17	SERVICE	IN	HCMOS, internal pull up	Input for service access, active low	-
18	**GPIO6**	**OUT**	**HCMOS, internal pull-down**	**User configurable**	**0-13**
19	**GPIO7**	**OUT**	**HCMOS, internal pull-down**	**User configurable**	**0-13**
20	**GPIO8**	**OUT**	**HCMOS, internal pull- down**	**User configurable**	**0-13**

*Ask availability.