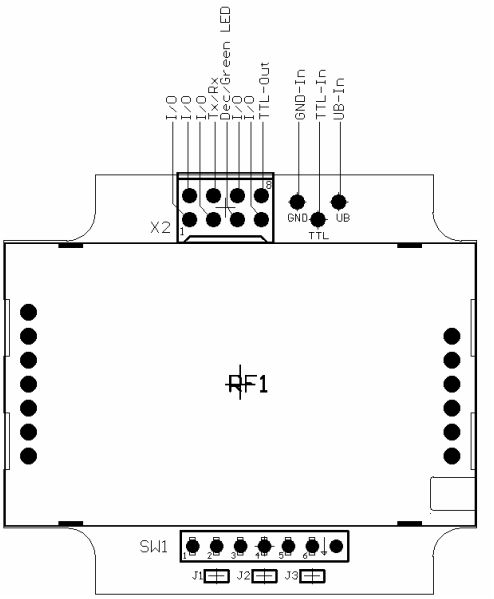
Operational Description (Theory of Operation) for CS458TR-1

The CS458TR-1 is a transceiver module with 458MHz frequency. The module is using FSK narrow band modulation. This module can work with serial data of 2400 to 9600 baud. The internal voltage regulator supports voltages of 3.4-12VDC with a current consumption of less than 50mA. This module can function as a transmitter or a receiver.



Normal mode. If the module starts as receiver (TX/RX pin Low or grounded when power is applied), the Green LED input needs to be connected to the Green LED output of the receiver/ decoder. The module will scan the frequency within the selected group. The module will set into one channel and first check if there is any RF signal in the channel (Detection level is –115dBm) if no RF signal is present, the module will step into next channel immediately. If there is a signal stronger than –115dBm detected, the module will lock into the channel and wait for 200mS, if during this time the Green LED input pin toggles from High to Low (Decoder is receiving correct signal), the module will lock into the channel with timeout of 2S. If the receiver do not receive toggle signal from the green LED input pin within 2S after it is locked, the module will start scanning the channels again.

If module starts as transmitter (TX/RX pin High or open when power is applied), the decrement switch input pin will function as decrement channel within the selected frequency group. There is 2S delay that the user needs to press the freq channel change for 2S before the RF module changes channel. This is a protection from accidental CHannel change and to make sure the coder have enough time to transmit the E-Stop command.

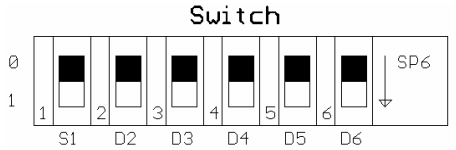
AUTX mode. The module will decrement the channel automatically every time it is powered on. This function is designed in some application where the decrement switch is not available and user needs to change the frequency by using the power switch.

FCS mode. The module will start with the first channel of the selected group and check if there is any transmission signal in the channel (Detection level –105dBm). If a signal stronger than –105dBm is detected the module will set to the next channel and recheck for the signal in the channel (-105dBm level). If all channels within the group are scanned and all of them occupied (signal stronger than –105dBm appears), the module will select the channel with the lowest signal

received within the frequency group and transmit in that channel. This feature is designed to make it possible to have multiple systems within close proximity where it is not possible to arrange the frequency channels.

In FCS mode, the decrement switch is also usable such that if user think that there is interference in the channel used, user can change frequency by pressing the ESTOP button and then press the decrement switch button to restart the FCS function. This setting is recommended for use because it will make the system more robust against RF interference.

FREQUENCY ALLOCATION FOR CS458TR-1



MANUAL SETTING
S1 = 0

D2	D3	D4	D5	D6	Frequency	CH
0	0	0	0	0	458.5000	0
0	0	0	0	1	458.5250	1
0	0	0	1	0	458.5500	2
0	0	0	1	1	458.5750	3
0	0	1	0	0	458.6000	4
0	0	1	0	1	458.6250	5
0	0	1	1	0	458.6500	6
0	0	1	1	1	458.6750	7
0	1	0	0	0	458.7000	8
0	1	0	0	1	458.7250	9
0	1	0	1	0	458.7500	10
0	1	0	1	1	458.7750	11
0	1	1	0	0	458.8000	12
0	1	1	0	1	458.8250	13
0	1	1	1	0	458.8500	14
0	1	1	1	1	458.8750	15
1	0	0	0	0	458.9000	16
1	0	0	0	1	458.9250	17
1	0	0	1	0	458.9500	18
1	0	0	1	1	458.9750	19
1	0	1	0	0	459.0000	20
1	0	1	0	1	459.0250	21
1	0	1	1	0	459.0500	22
1	0	1	1	1	459.0750	23
1	1	0	0	0	459.1000	24
1	1	0	0	1	459.1250	25
1	1	0	1	0	459.1500	26
1	1	0	1	1	459.1750	27
1	1	1	0	0	459.2000	28
1	1	1	0	1	458.5000	0
1	1	1	1	0	458.5250	1
1	1	1	1	1	458.5500	2

AUTOMATIC SETTING
S1 = 1
D2 = 1 = FCS (Free Channel Search TX), and SCAN-RX
D3 = 1 = AUTX (Automatic Channel Change TX), and SCAN-RX

Freq Group For FCS/AUTX/SCAN

D4	D5	D6	Channels
0	0	0	18, 15, 10, 3, 1
0	0	1	17, 14, 9, 2, 0
0	1	0	18, 12, 8, 5, 3
0	1	1	17, 11, 7, 4, 2
1	0	0	27, 19, 16, 14, 10, 0
1	0	1	24, 15, 13, 9, 6, 1
1	1	0	26, 18, 12, 8, 5, 3
1	1	1	25, 17, 11, 7, 4, 2