ANYWAVE

ACT-5X
ATSC Exciter/Translator
User Manual

Version 3.0

ACT-5XU-A -C

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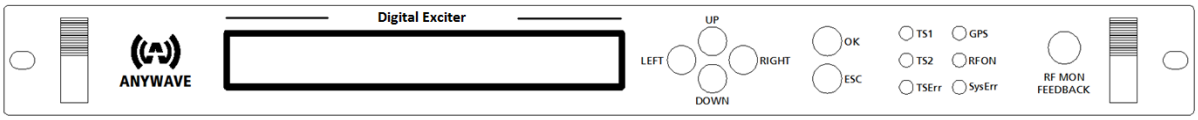
1 Product Appearance

1.1 Front Panel



LCD:

40×2 LCD with power saving backlight

6 Buttons:

Left, Right, Up, Down, OK, ESC

6 LEDs:

When in Exciter mode:

LED_TS1: Green light on indicates TS1 is selected and the input TS signal is OK

LED_TS2: Green light on indicates TS2 is selected and the input TS signal is OK

LED_TSErr: Red light on indicates the selected input signal has error (Refer to Chapter 5)

When in Translator mode:

LED_ TS1: Green light on indicates the synchronization of input RF signal is OK

LED_TS2: Green light on indicates the equalization of input RF signal is OK

LED_TSErr: Red light on indicates there is synchronization error or equalization error

In both Exciter and Translator mode:

LED_ GPS: Green light on indicates GPS connected and locked

LED_ RFON: Green light on indicates system ready and RF on

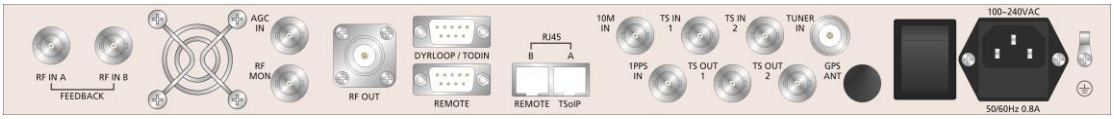
LED_ SysErr: A flashing red LED indicates the presence of a system error (Refer to Chapter 5)

A solid red LED indicates the unit is in "Local (LCL)" control mode, and when this LED is off, this indicates that the unit is in "Remote (RMT)" control mode

1 BNC connector:

RFMON: Reserved

1.2 Back Panel



RF_IN_A:	Feedback signal, sampled after the band-pass filter (-5 to -15dBm)
RF_IN_B:	Feedback signal, sampled before the band-pass filter (-5 to -15dBm)
AGC_IN:	Feedback DC voltage for AGC control (0-5VDC)
RF_MON:	Loop out of [RF_OUT] for monitoring (-25 dB below RF_OUT)
RF_OUT:	Main RF signal output N-type female (nominal 0 dBm output)
DRYLOOP (RS232):	Dry loop for remote control
REMOTE (RS232):	Serial port for remote control
REMOTE (RJ45-B):	10M/100M Ethernet for remote control
TSoIP (RJ45-A):	Reserved
10M_IN:	10 MHz input from external GPS receiver
1PPS:	1 PPS input from external GPS receiver
TS_IN_1:	The first port of TS inputs, DVB-ASI only
TS_OUT_1:	Loop out of [TS_IN_1] for monitoring
TS_IN_2:	The second port of TS inputs, DVB-ASI only
TS_OUT_2:	Loop out of [TS_IN_2] for monitoring
TUNER_IN:	Received RF signal input, N-type female

2 Operation Specifications

- Environment
  - Operating Temperature: -10 ~ 50 ºC
  - Operating Humidity: ≤ 95%
  - Atmospheric Pressure: 86 kPa ~ 106 kPa
- Power Supply
  - Voltage: 88 ~ 264 VAC
  - Frequency: 50 / 60 Hz
- Inputs/Outputs
  - RF_IN_A /RF_IN_B
    - Connector: BNC female
    - Impedance: 50 Ω
    - Level: -30 dBm ~ 0 dBm
      Recommended range: -15 dBm ~ -5 dBm
    - Location: Back Panel
  - AGC_IN
    - Connector: BNC female
    - Impedance: 50 Ω
    - DC Voltage: 0 V ~ 5 V
    - Location: Back Panel
  - RF_OUT
    - Connector: N-type female
    - Impedance: 50 Ω
    - Level: -25 dBm ~ +5 dBm
    - VSWR: > 15 dB
    - Location: Back Panel
  - RF_MON (loop out of [RF_OUT])
    - Connector: BNC female
    - Impedance: 50 Ω
    - Level: 25 dB below [RF_OUT]'s output level
    - Location: Back Panel
  - 10M_IN
    - Connector: BNC female
    - Impedance: 50 Ω
    - Level: AC-coupled, $V_{P-P} \geq 300$ mV
    - Location: Back Panel

- 1PPS (input)
  - Connector: BNC female
  - Impedance: 50 Ω
  - Level: 3.3 V-TTL
  - Input trigger: Positive Transition
  - Location: Back Panel
- TS_IN_1/ TS_IN_2
  - Connector: BNC female
  - Impedance: 75 Ω
  - Level: See Table 1
  - Location: Back Panel
- TS_OUT_1/ TS_OUT_2
  - Connector: BNC female
  - Impedance: 75 Ω
  - Location: Back Panel
- TUNER_IN
  - Input level range: -80 dBm ~ - 15 dBm
  - Input connector: N-Type female, 50 Ω

Table 1 ASI Input Specifications

No	Content	Unit	Value
1	Input Level	mv	≥ 200
2	Positive Transition (20%~80%)	ps	≤ 1200
3	Negative Transition (20%~80%)	ps	≤ 1200
4	Deterministic Jitter	%	≤ 10
5	Random Jitter	%	≤ 8

Note

1) The electrical interface characteristics are measured under normal conditions. Values may vary.
2) Operating in abnormal conditions may result in damage to the equipment. Long operating hours in severe environments may reduce the reliability of the entire system, which may cause permanent damage to equipment. Make sure all electrical interface characteristics and environmental parameters are within the defined range listed above before operating this equipment.

3 Menu

3.1 Initialization

Connect the power supply of the ACT-5X and then turn on the exciter/translator via the power switch located on the rear of the unit. The initialization process takes about 5 seconds to finish while the RF output level gradually increases to the pre-set value.

The ACT-5X platform can operate in both Translator and Exciter modes. In Translator Mode, the unit receives an RF signal (via the TUNER_IN rear panel connection) and feeds this to an internal tuner that performs a demodulation at the specified receive frequency, followed by a modulation at the specified transmit frequency. In Exciter Mode, the unit operates upon a TS signal (received via one of the ASI rear panel BNC inputs, TS_IN_1 or TS_IN_2) and performs a modulation at the specified transmit frequency.

The first step after turning on the unit is to confirm the desired operating mode (Exciter or Translator) according to your application. The “INPUT” setting located under the “SYSTEM” submenu should be set to “TS” for exciter mode or “TUNER” for translator mode. Please see Table 6 below for details.

3.2 Query Mode

Query mode is a mode which displays parameters and status of the exciter/translator. There are three pages in query mode. Press the "Right" or "Left" button to switch between different pages which are shown in Table 2 through Table 4 below.

Note: The settings shown in the tables below for illustration purposes only and may be different from those in actual use.

Table 2 First Page in Query Mode (EX mode)

FWD	TSNR	LID	UID
100%	38.5	43.5	44.0

Table 3 Second Page in Query Mode

INPUT	STA	RSSI	RSNR	TEMP
TS1	OK	-45	30.75	104.90°F

Table 4 Third Page in Query Mode

RXFREQ	TXFREQ	AGC	GPS	CTRL	ADPC
653M	653M	OFF	LOCK	RMT	OFF

Note:

1) The "TSNR", "LID" and "UID" in Table 2 are the measurements of feedback signal quality. This feedback signal could be from a transmitter or the exciter/translator itself and its input range is -30 dBm to 0 dBm (Recommended range is -15 dBm to -5 dBm). These measurements are derived from the After-filter Feedback Signal connected to the rear port [RF_IN_A] BNC connector. If there is no signal connected, these readings will not be available or not valid. The "TSNR" is measured with equalization on. It takes about 10 seconds to get the first reading on "TSNR", and about 3 seconds to get the first reading of "LID" and "UID". After averaging, the displayed upper limit on the "TSNR" is about 39 dB and about 54 DB for the IMD metrics.
2) The "RSNR" and "RSSI" in Table 3 are status of the signal from the tuner when working in Translator Mode. And the "RSNR" is measured with equalization on. Therefore if there is no signal connected to port "RF_IN", these readings will not be available or not valid.
3) The "CTRL" status in Table 4 indicates "RMT" (Remote) mode or "LCA" (Local) mode. When in "LCA" mode, the exciter/translator can only be controlled by the front panel interface and when in "RMT" mode, settings from the front panel keyboard are ignored - with the exception of "RMT"/"LCA" setting - and while in RMT mode, only commands from remote control interface, such as the WEB or serial port, are processed.

3.3 User Menu

In Control mode, the user may modify configuration settings of the exciter/translator. There are two levels of control, the User Menu and the Advanced Menu. To enter the User Menu, press ***both*** the "Left" and "Right" buttons ***at the same time*** while in query mode. The User Menu in control mode is shown below in Table 5. In the next section we will present the Advanced Menu.

Table 5 Main Menu

Welcome to setting interface!				
*SYSTEM	RF	FREQ	MODE	CONFIG

The Main User Menu consists of 5 sub-menus: SYSTEM, RF, FREQ, MODE and CONFIG.

Once at the main menu, press the "Left" or "Right" buttons to move the cursor and navigate to the desired sub-menu. Once the cursor is positioned just above the desired sub-menu, press the "OK" button to enter the target sub-menu. When in the corresponding sub-menu, press "Left" or "Right" button to move the cursor to the target parameter and then press the "Up" or "Down" buttons to select different options from the drop-down boxes. Once you have selected the desired option, ***press the "OK" button to apply and save, or press the "ESC" button to skip the changes and return to the upper menu.***

All the parameters of sub-menus are shown in Tables 6 through Table 10 respectively.

Table 6 System Menu

	CTL	ADPC	INPUT
Default	RMT	OFF	TS
Options	RMT	OFF	TS
	LCA	UPDATE	TUNER
		HOLD	

Note:

1) The "CTL" (Control) setting has two options, "RMT" (Remote) and "LCA" (Local). The exciter/translator can be switched between these two modes only via the front panel interface. When in "Local" mode, the exciter/translator can only be controlled by the front panel interface and all commands from serial port or WEB are ignored. When in "Remote" mode, settings from the front panel keyboard are ignored - with the exception of "RMT"/"LCA" setting, and only commands from the remote control interface, such as serial port or WEB, are processed. Notice that LED "SysErr" remains on all the time in "LCA" mode, and only indicates a SysErr when it is flashing.

2) The "ADPC" parameter in the "SYSTEM" sub-menu has options of "UPDATE", "HOLD" and "OFF". If option "OFF" is selected, the ADPC function will be turned off (no correction applied). If option "HOLD" is selected, the exciter will ***apply*** the last stored linear and non-linear correction coefficients. If both feedback signals are connected properly and option "UPDATE" is selected, this will cause the exciter to run the Adaptive Digital PreCorrection (ADPC) function, automatically computing coefficients for ***both the linear and non-linear*** pre-correction for the entire transmission system including the distortion of both transmitter and band-pass filter. This process takes about 8 to 10 minutes, after which the computed corrections are automatically store in nonvolatile memory. Please refer to Chapter 4 for detailed information.

3) The "INPUT" setting has two options, "TUNER" (Translator Mode) and "TS" (Exciter Mode). When "TUNER" is selected, the unit functions as a translator which receives an off-air RF signal with a tuner, and then performs the demodulation, followed by a modulation. When "TS" is selected, the unit functions as an exciter which receives an ASI TS signal directly and performs only the modulation.

Table 7 RF Menu

	RF	POWER	AGC	LVL	REF
Default	ON	+0.00	OFF	000	000
Options	ON	-25.00	OFF	000~255	000~255
	OFF	-24.95	ON		
		-24.90			
		...			
		...			
		...			
		+4.90			
		+4.95			
		+5.00			

Note:

1) The RF parameter in the “RF” sub-menu turns the RF output of the exciter/translator ON or OFF.
2) The POWER parameter specifies the RF output power level in dB (in the range of -25 to +5 dBM, note: typical exciter/translator output level is 0 dBm).
3) The "AGC" parameter in the "RF" sub-menu is used to engage or disengage the exciter/translator system-level automatic gain control. AGC has options "ON" and "OFF". "LVL" and "REF" are decimal numbers whose range is from 0 to 255. "LVL" is the reading of the DC voltage from Port [AGC_IN] which reflects the AGC feedback signal level, and "REF" is the reference value (or target) of the AGC function. When AGC is turned ON for the first time, the "LVL" will be saved automatically to "REF" as a reference. So if the AGC feedback signal level changes due to temperature differences or mismatch impedance, etc., the reading of "LVL" will be different from that of "REF", and the AGC function starts to slowly adjust the output level of the exciter/translator to approach to the pre-set reference level. The AGC adjustable range is from +1 dB to -10 dB.

Table 8 FREQ Menu

	RXFREQ	TXFREQ	Hz
Default	653M	653M	+00000
Options	473M	473M	-50000
	479M	479M	-49999
	485M	485M	-49998
	...	...	...
	...	...	...
	...	...	...
	875M	875M	+49998
	881M	881M	+49999
	887M	887M	+50000

Note:

1) The RXFREQ parameter in the “FREQ” sub-menu specifies the off-air receiver channel frequency for the internal tuner to receive the proper over-the-air UHF channel. This setting is used when the unit is configured to operate as a Translator (“INPUT” set to TUNER) and is ignored when the unit is configured to operate as an Exciter (“INPUT” set to TS).
2) The TXFREQ parameter in the “FREQ” sub-menu specifies the channel frequency for the modulated RF output signal of the exciter/translator.
3) The "Hz" parameter provides a direct adjustment (offset) of the frequency of the TXFREQ RF output signal. The range is -50,000 Hz to +50,000 Hz, with steps of 1 Hz. This feature is designed for up to 50 kHz spectrum shift as ATSC standard required, or adjustment of the output frequency for carrier accuracy.

Table 9 MODE Menu

8VSB

Note:

1) The MODE sub-menu provides settings for the modulation mode selected. The ACT-5X Exciter/Translator operates in ATSC Legacy (A/53) mode and as such always displays 8VSB under the MODE menu. There is an optional ACT-5X series platform that operates as an ATSC MH Translator, which presents additional parameters under this MODE sub-menu for MH (A/153) configuration.

Table 10 CONFIG Menu

	*ID	bps	IP	GATEWAY	MASK	UPGRADE
Default	ID: 80H	19200	192.168.001.143	192.168.001.001	255.255.255.000	NO
Options	ID: 00H	19200	***.***.***.***	***.***.***.***	***.***.***.***	NO
	ID: 01H	9600				YES
	...	38400				
	ID: FEH					
	ID: FFH					

Note:

1) "IP", "GATEWAY", and "MASK" are used to establish a valid Ethernet connection for remote control via the REMOTE RJ45 located on the rear panel. The exciter has a built-in WEB GUI which requires only a standard web browser run by a PC. Simply by entering specified IP address, which is setup in CONFIG sub-menu, in a browser's address bar, the login interface will pop up and give user prompts to input the user name and password. There are two tiers of web interface available. The first "guest" tier is limited in monitoring and control, allowing users to retrieve information such as SNR and shoulder measurements, user configuration, and alarms. The guest account is accessed with a user name and password of "guest" and "guest" (case sensitive). The second "admin" tier provides full status and control of the exciter/translator and is accessed with a username and password of "anywavecom" and "anywavecom" (case sensitive).
2) "UPGRADE" is a reserved mode to perform an upgrade of the code inside the exciter/translator unit.

3.4 Advanced Menu

To enter the Advanced Menu, first enter the User Menu by pressing the both ***"Left" and "Right"*** buttons at the same time to arrive at the menu shown below.

Table 11 User Menu

Welcome to setting interface!				
*SYSTEM	RF	NETWORK	MODE	CONFIG

Then, press both the ***"Up" and "Down"*** buttons at the same to enter Advanced Menu, as shown below.

Table 12 Advanced User Menu

Welcome to advanced interface!						
*AD1	MUTE	TX_EX	DPD	LATCH	SN	PAC

Table 13 through Table 19 show the corresponding sub-menus.

Table 13 AD1 Menu

	PCRL	Sw_Up	Sw_Down	SW_RT	NET
Default	1	OFF	OFF	03	AUTO
Options	0: Null packet deletion ON but NO PCR	ON	ON	03~FF	AUTO
	1: Null packet deletion ON and PCR ON	OFF	OFF		10M
	2: NO null packet deletion and NO PCR				100M
	3: NO null packet deletion but PCR ON				

Note:

1) "PCRL" in Advanced User Menu contains 3 bits. Its default value is 1 which means both PCR function and NULL packet deletion is turned on. It's only applicable in Legacy mode. In MH mode, all input streams remain untouched.

   a) Bit2 is the switch of Insert-NULL-Packet.

   It's not used now (reserved) because when TS rate is lower than desired rate and FIFO is Almost Empty (less than 2.5% of its capacity), if the system does not insert NULL packets into the stream automatically, the whole FIFO will be reset and lose more useful bytes.

   b) Bit1 is the switch of Delete-NULL-Packet.

   When value is "0":

   If FIFO is Half Full (higher than 50% of its capacity), then the system will DELETE all new coming NULL packets from the stream automatically, until FIFO is less than 50%.

   When value is "1":

   If FIFO is Half Full, the system will NOT DELETE any new coming packets.

   c) Bit0: The switch of Program Clock Reference Correction function

   "1" means PCR function is ON;

   "0" means PCR function is OFF

2) "Sw_Up" and "Sw_Down" are a pair of switches which control the "Slow Up / Down" function. If "Sw_Up" is "ON", when there is a power raise, it will go up gradually. Likewise if "Sw_Down" is "ON", when there is a power decrease, it will go down gradually too. This "Slow Up / Down" function is designed for safety consideration and to prevent the transmitter connected from any possible damage due to the dramatic change of power.

3) SW_RT establishes the RF ramp up time, with larger numbers producing a slower ramp to full output power.

4) NET allows the selection of 10M, 100M, or Auto to optimize networking connections with existing local networks.

Table 14 MUTE Menu

	M_TS
Default	0
Options	0
	1

Note:

1) "M_TS" is the selection of MUTE/PRBS on loss/failure of RF input reception.

   M_TS =1: RF Mute on loss/failure of RF input reception.

   M_TS =0: Output PRBS instead on loss/failure of RF input reception.

Table 15 TX_EX Menu

	RC_CMD	FWD_CAL	CW	RST
Default	Other	OK	OFF	NO
Options	Other	OK	OFF	NO
	IO	CAL	ON	YES

Note:

1) “RC_CMD” determines where the TX On/Off command comes from:
   “IO” means from Pin 1 of Dry Loop;
   “Other” means from either Serial or Web interface.
2) "FWD_CAL": Default value is "OK". "FWD_CAL" is used to calibrate the 100% FWD power level.

Table 16 DPD Menu

	PDT	CFR	ADPC	FSSI
Default	5	F	OFF	0%~100%
Options	0~F	0~F	HOLD	
			UPDATE1	
			UPDATE2	
			UPDATE3	

Note:

1) "PDT" is the pre-set time for ADPC function which ranges from 0x0 to 0xF, and recommended value is 0x5 which means about 7 minutes in "UPDATE3" part and about 10 minutes for the entire ADPC process (all 4 steps together).
2) "CFR" is the pre-set crest factor reduction level which ranges from 0x0 to 0xF. The lower the parameter's value is, the harder the reduction of crest factor will be. And 0xF means bypass the whole CFR function (No reduction at all).
   Note: If ADPC (Pre-correction) is ongoing, the system will disable automatically the CFR function (clipping) and will only resume the function after ADPC is finished.
3) "ADPC" here has the same function as that in control mode (default user menu) but separates into 3 steps. And the control here and there (default user menu) sync up to each other. All 3 steps still have to be run in strict sequence to get a complete compensation done. However going step by step gives it a chance to monitor each step's performance more closely. Among all 3 steps, "UPDATE1" is to compensate the linear distortion before band-pass filter, and "UPDATE2" is for the linear distortion after band-pass filter. "UPDATE3" is for both linear and non-linear distortion in the whole transmitting system (include both the power amplifier and the band-pass filter).

4) "FSSI" is indicator of feedback signal strength and its range is from 0% to 100%.
At +5 dB level, FSSI=100%.
At -5 dB level, FSSI=75%
At -15 dB level, FSSI=50%
At -20 dB level, FSSI= 25%
*The readings listed above are typical values. There may be variations on different frequencies or different units. Overall the recommended level of feedback signal is -15 dBm to -5 dBm.
When FSSI is less than 20% or higher than 75%, the reading will keep flashing, indicating the feedback level may need to be adjusted.

Table 17 Latch Menu

	RESET	U1	U2	RF	GPS	TS	SYS	1PPS	SFN
Default	OK	0	0	0	0	0	0	0	0
Options	OK	0	0	0	0	0	0	0	0
	CLR	1	1	1	1	1	1	1	1

Table 18 SN Menu

	SN	GUI_KEY
Default	0000000000000	00000000
Options		

Table 19 PAC Menu

	Vol_9	Vol_50	Cur_50	PA_FWD	PA_REF	881_GV	VSWR	PA_TEMP	PA__LVL	CUR2_50
Value										
Content	Voltage of 9V DC supply	Voltage of 50V DC supply	Current of 50V DC supply	Forward power of PA	Reflected power of PA	Grid Voltage	Voltage standing wave ratio	Temperature of PA	PA rated power	Current 2 of 50V DC supply

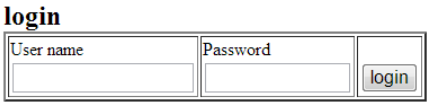
Note:

1) CUR2_50 is only applicable when rated power is 200W or higher.

3.4 Web Interface

The ACT-5X exciter/translator has a built-in web interface accessible via the rear port REMOTE RJ-45 connection, Once networked to your PC, the built-in web interface may be accessed via a web browser (such as Internet Explorer or Firefox, etc.) by entering the IPaddress of the exciter (default 192.168.1.143, see Table 10 in section 3 for changing the default IPaddress).

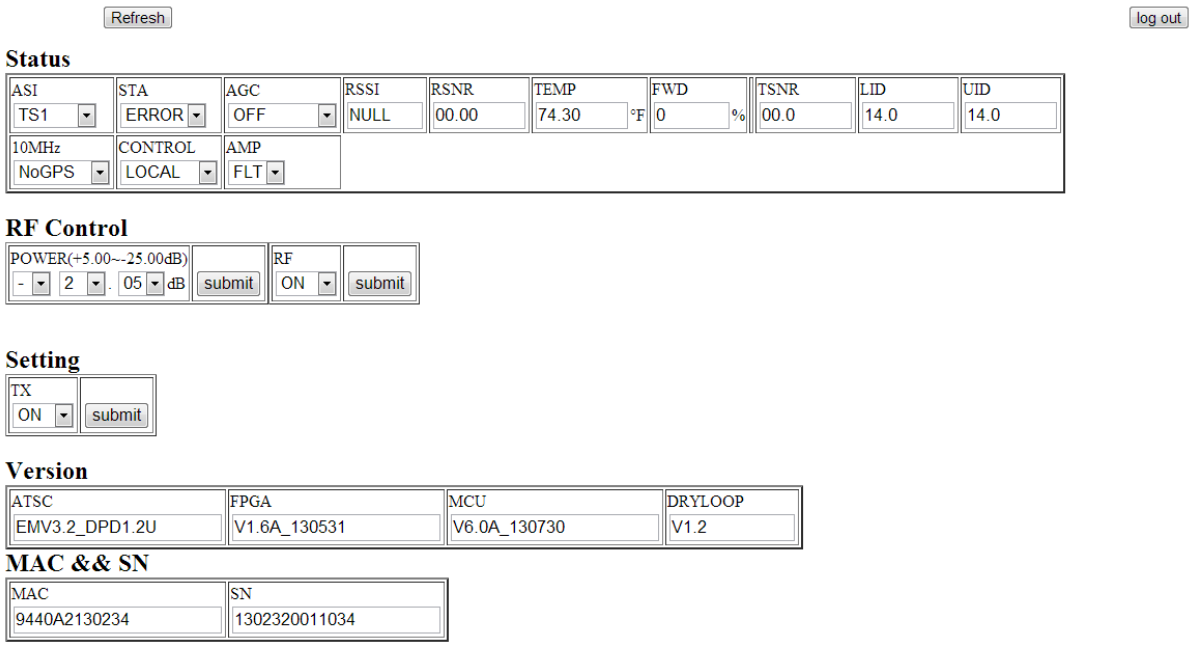
Launching a web browser and entering the exciter/translator IPaddress (192.168.1.143) will bring up the following login window.



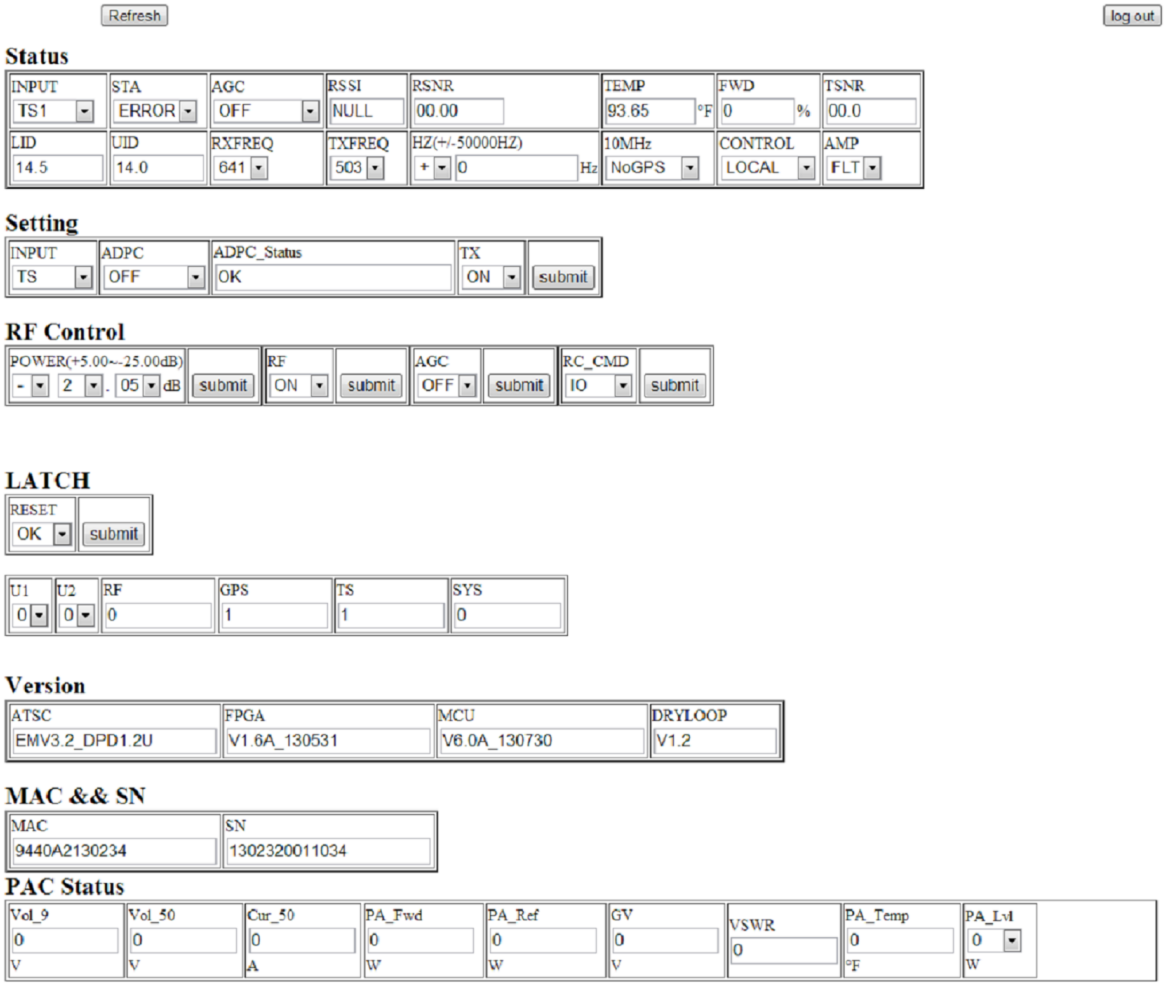
There are two tiers of web interface available. The first “guest” tier is limited in monitoring and control, allowing users to retrieve information such as SNR and shoulder measurements, user configuration, and alarms. The guest account is accessed with a user name and password of "guest" and "guest" (case sensitive). The second “admin” tier provides full status and control of the exciter/translator and is accessed with a username and password of "anywavecom" and "anywavecom" (case sensitive).

The screenshots below highlight the status and control available via the guest and admin web interfaces.

guest web interface



admin web interface



4 Connection

4.1 Connect the Transmitter

- Don’t turn on or off the exciter/translator when the transmitter is running. The correct order is:
  - First, turn on the exciter/translator and put it in Exciter Mode. Or if Translator Mode is preferred, ensure there is valid RF input connected to the translator, or the function of Muting RF output on loss of missing or invalid input signal is turned off. Otherwise there may be no RF signal output.
  - Measure the RF output level of the exciter/translator to make sure it meets the requirement of the transmitter input level. If the output level is out of range, change the parameter "POWER" in "RF" sub-menu in control mode to make the adjustments. Refer to Table 7, Chapter 3 for details. If the output signal level is within range, connect the exciter/translator's output (port [RF_OUT] on back panel) to the transmitter's input.
  - After the exciter/translator is stable, turn on the transmitter.
  - Likewise, turn off the transmitter first before making any change to the exciter/translator's settings. Restart the transmitter after the exciter/translator is stable again.

4.2 Start ADPC function

1) After the exciter/translator is connected to a transmitter, first of all measure the level of the transmitter's output (both ***before and after*** band-pass filter). Make sure it meets the requirement of exciter/translator's feedback level (-30 dBm ~ 0 dBm and recommended range is -15 dBm to -5 dBm).
   1) If the signal level is out of range, use extra devices, e.g. attenuator, to make adjustments.
   2) If the signal level is within the range, connect the transmitter's output which is ***before the*** band-pass filter to port [RF_IN_B] and another output which is ***after*** band-pass filter to port [RF_IN_A] respectively. Figure 1 below demonstrates the correct connection.

- Start ADPC function
  - With AGC turned OFF, Select option "UPDATE" under "ADPC" of the “SYSTEM” sub-menu. Press the OK button to start the correction process, which will in sequence run Linear and Non-linear correction showing the status ("Wait a moment...") and readings of "TSNR", "LID" and "UID" on the front panel LCD. Usually this takes about 10 minutes to finish the total compensation of both ***the linear and non-linear*** distortion in the whole transmission system including both power amplifier and band-pass filter. Once the new correction coefficients have been computed and applied, there is an automatic "Saving" process which stores the ADPC data into the on-board memory.
  - Readings of "TSNR", "LID" and "UID" provide a continuous measurement and display of quality of feedback signal during the ADPC process. Compare these readings before and after the ADPC process as the reference of correction performance.
  - There is a "Loading" process that takes roughly 10-15 seconds when the exciter/translator is first turned on again with the ADPC "HOLD" option selected. This ***restores*** the ADPC data saved the last time an entire ADPC process was successfully completed.

Note:

1) Do not change the connection status during the ADPC process otherwise it may affect the performance.
2) If any abnormal situation occurs during the ADPC process, the system will bypass all the pre-correction data immediately and leave the corresponding status on the front panel LCD. Press any key to cancel the ADPC function manually and restart the ADPC function again after the problems are resolved. Refer to Chapter 5 for further information.

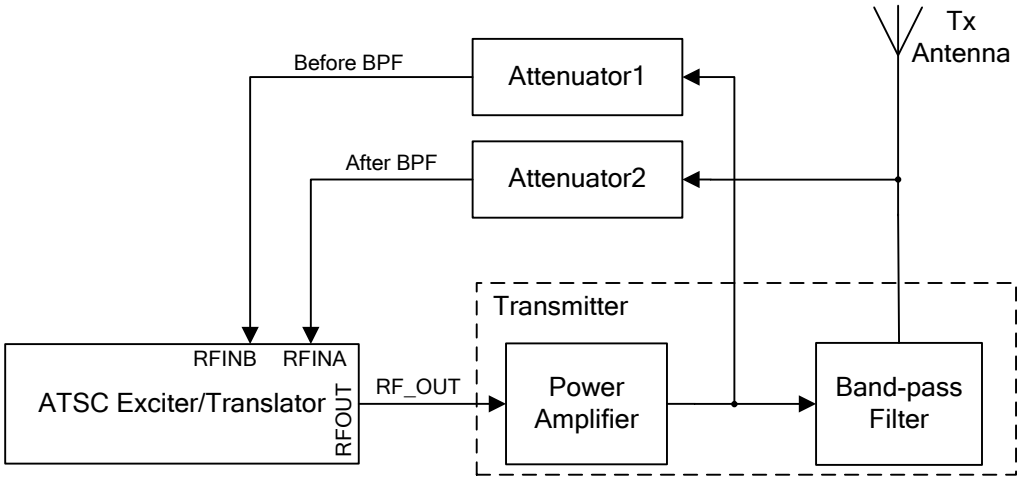


Figure 1 Connection with Transmitter of UPDATE Function

5 Troubleshooting

5.1 TS Input (Exciter Mode)

- TS1 ERROR
  - Alarm message
    - LCD: TS1 ERR
    - LED_ TS1: Off
    - LED_ TSErr: On
    - Dry Loop: 0 V (TS Fault)
  - Cause: Input signal from port [TS_IN_1] is lost or has invalid format.
  - Solution: Check connection of port [TS_IN_1], and make sure input signal has valid format.
- TS2 ERROR
  - Alarm message
    - LCD: TS2 ERROR
    - LED_ TS2: Off
    - LED_ TSErr: On
    - Dry Loop: 0 V (TS Fault)
  - Cause: Input signal from port [TS_IN_2] is lost or has invalid format.
  - Solution: Check connection of port [TS_IN_2], and make sure input signal has valid format.
- Transport Stream Rate Overflow or Underflow
  - Alarm message
    - LCD: TS_RATE Overflow
  - Cause: The input TS bit rate is higher than the bit rate required.
  - Solution: Adjust the TS input bit rate. Or connect all devices with the same reference clock (GPS).

  Note:

  When in Exciter Mode, it has bit rate auto-adaptation function to deal with the bit rate mismatch. It will automatically delete null packets or insert null packets when necessary to achieve the accurate acquired bit rate. The function is able to be turned off in advanced settings.

5.2 Tuner Input (Translator Mode)

- Synchronization error
  - Alarm message
    - LCD: None
    - LED_ TS1: Off
    - LED_ TSErr: Flashing
    - Dry Loop: 0 V (SysErr Fault)
  - Cause: The input RF signal from port [TUNER_IN] will first go through the synchronization and could not pass this step probably due to a week signal or a wrong received channel setup.
  - Solution: Make sure the received channel setting (RXFREQ) is correct and the input level of port [TUNER_IN] is stable and within acceptable range (-80 dBm ~ -15 dBm, with recommended range -60 dBm ~ -40 dBm).

- Equalization error
  - Alarm message
    - LCD: None
    - LED_ TS2: Off
    - LED_ TSErr: Flashing
    - Dry Loop: 0 V (SysErr Fault)
  - Cause: If LED_ TS1 is also off, it means the input RF signal could not pass the prior synchronization step so the equalization step is not started yet. If LED_TS1 is on but still LED_TS2 is off, then it means the input signal has poor signal quality so that it could not pass the equalization and therefore could not be demodulated successfully.
  - Solution: If the synchronization is OK (LED_TS1 remains ON), adjust the Rx antenna for a better reception. If the problem still exists, restart the translator.

5.3 GPS

- No GPS
  - Alarm message
    - LCD: GPS NoGPS
    - LED_ GPS: Off
  - Cause: This warning displays when no external GPS is connected.
  - Solution: Check the connection with external GPS device.
- GPS Unlocked
  - Alarm message
    - LCD: GPS UNLOCK
    - LED_ GPS: Off
  - Cause: The selected reference clock is unlocked or unstable.
  - Solution: Check the status of external GPS device.

5.4 ADPC

- Feedback Signal Level
  - Alarm message
    - LCD: "FEEDBACK TOO BIG! Press Any key to Esc"
      Or "FEEDBACK TOO SMALL! Press Any key to Esc"
    - LED_ SysErr: Flashing (during the ADPC process)
    - Dry Loop: 0 V (SysErr Fault)
  - Cause: Feedback signal level is too high or too low from the very beginning of each part of ADPC function.
  - Solution: Cancel the ADPC function manually and then adjust the input level of the feedback signal according to the messages on the LCD. Start the ADPC function again after the problem is resolved.

Note:

The acceptable range of feedback signal from port [RF_IN_A] or [RF_IN_B] is -30 dBm to 0 dBm, and the recommended range is from -15 dBm to -5 dBm.

- Feedback Signal Connection Error
  - Alarm message
    - LCD: "FEEDBACK LINK ERROR! Press Any key to Esc"
    - LED_ SysErr: Flashing (during the ADPC process)
    - Dry Loop: 0 V (SysErr Fault)
  - Cause: Feedback signal connection is interrupted, or signal level changes dramatically during the ADPC process.
  - Solution: Cancel the ADPC function manually and then check the connection and the level of the feedback signal. Start the ADPC function again after the problem is resolved.
- ADPC Error
  - Alarm message
    - LCD: "ADPC ERROR! Press Any key to Esc"
    - LED_ SysErr: ON (during ADPC process)
    - Dry Loop: 0 V (SysErr Fault)
  - Cause: The measured IMD or SNR during ADPC process does not pass the pre-set threshold.
  - Solution: Cancel the ADPC function manually and then check the status of connection and entire transmitting system. Start the ADPC function again after the problem is resolved.

5.5 Other Problems

- Temperature
  - Alarm message
    - LCD: TEMP HIGH
    - LED_ SysErr: ON
    - Dry Loop: 0 V (SysErr Fault)
  - Cause: The Temperature of the exciter/translator is too high.
  - Solution: Cool the exciter/translator.
- No RF output
  - Alarm message
    - LCD: None
    - LED_ RFON: Off
    - Dry Loop: 0 V (RF not Present)
  - Cause: When in Translator Mode, the translator could MUTE its RF output on loss of input RF signal from port [TUNER_IN] or an unsuccessful demodulation by configuration. It's designed so to protect the broadcasting signal purity when one translator has a bad received signal or a breakdown. And also RF output may have been turned off by front panel setting or via serial port or WEB interface. Or if the exciter/translator itself has a breakdown, there would be no RF output too.

- Solution: First of all, check the mute settings in the advanced menu. If the mute is ON for Translator Mode, then check the signal and connection of port [TUNER_IN] to see if there is a failed reception. The LED lights on the front panel could provide some indications in these situations. Or check the setting of "RF" via front panel, serial port or WEB interface and ensure it’s turned ON. Restart the exciter/translator if necessary. If the problem still exists, contact the manufacturer for further solution.

Note:

If "Slow ON/OFF" function is turned on (user configurable in advanced settings), during power changing process, LED_RFON may be flashing.