

SSC-XL Deluxe Station Controller



Congratulations on your purchase of the SSC-XL Deluxe Station Controller from 403A. The SSC-XL is the most complete, easy-to-use, amateur radio station controller available. It is designed for high performance, with future expansion capability.

The SSC-XL can work as a stand-alone controller. It is programmable by a PC application. You can control it with an optional external keyboard, or it may be connected to a PC via a USB cable for desktop control of virtually any device in your station.

We hope that you will enjoy your new SSC-XL!

SSC XL is a very flexible platform with an almost infinite number of possible uses / interconnections:

de show New folder

Output settings

AUX OUTPUTS 1

AUX OUTPUTS 2

MASTER DEVICE OUTPUTS

BAND M X Y MODE TX

IN 6 1 1 1 KYB 1 SO2R

10 2 2 2 PC 2 R1

15 3 3 3 3 R2

20 4 4 4 4

40 5 5 5 5

80 80 80 80 80

160 160 160 160 160

INH INT

NTW

403A Signature

USA

Smart station controller-interlock SSC XL

Save Cancel

USA

JA

VK-ZL

PY

< key not set >

D9

< key not set >

D6

< key not set >

D3

< key not set >

Decimal

Set outputs...

Delete

Set outputs...

Delete

Set outputs...

Delete

Set outputs...

Delete

Add

KINER

Rec Tab Back Space

Num Lock / * -

7 8 9 B 1

4 5 6

1 2 3 V

0 Ins F Enter

USA

Virtual

BUTTONS

Flexibility

403A Signature

SSC XL
403A Signature

Smart station controller-interlock **SSC XL**

SSC-XL Front Panel

(1) BAND

Indicates current band in use.

(2)(3)(4) M, X, Y

These LED indicators are programmable freely, in any way you desire. They come in groups of 5. For example:

M – Main Antennas

X – ReceivingAntennas

Y – 4Square,or stack, or whatever

The "**S**" LED indicates SPLIT operation, and it lights up when there are multiple antennas on one band.

(5) MODE LEDs

KYB/PC - These LEDs indicate whether Keyboard or PC control is engaged.

INT - Indicates that the Interlock mode is engaged.

INH - Indicates that the Inhibit function is engaged.

NTW – Marks the group of functions that require the network (INH, INT).

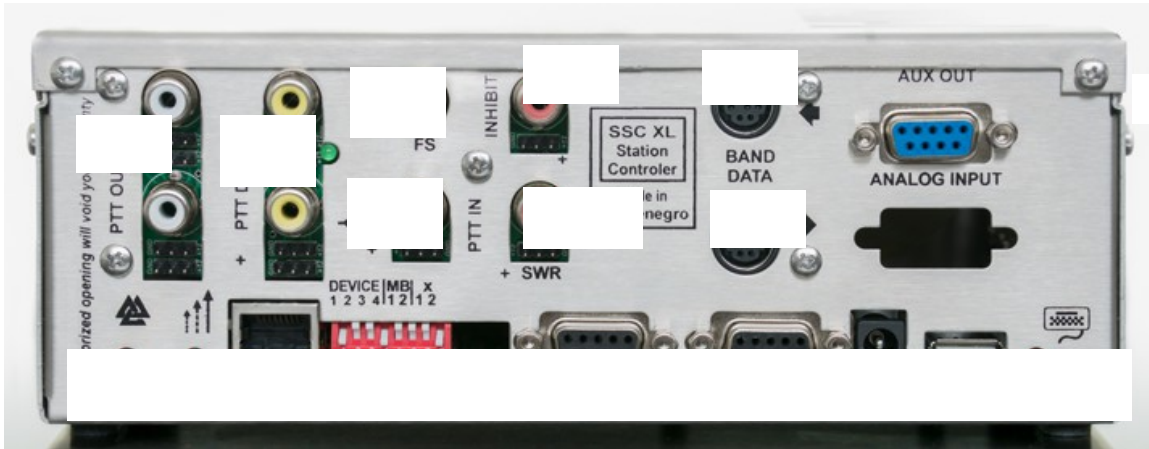
PTT - This indicates that a PTT signal has been detected.

TX - One or more LEDs will light up if a transmitter in the network is active, showing you its corresponding number.

SO2R/R1/R2 - These LEDs will light up, as appropriate, during SO2R (Single Operator,

2 Radio) operation. R1 is Radio 1, and R2 is Radio 2.

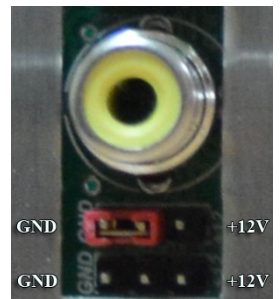
Rear panel overview



(1) PTT Outputs (With Delay)- yellow RCA connector

Jumpers to program the PTT Outputs are located below it's RCA connector socket. These outputs may include a programmable delay, for amplifier or preamplifier sequencing, etc. The RCA jack can be configured for either:

1. Closure to Ground (left position)
2. +12V DC on Transmit (right position)



The top position is for „normally open “ configuration.

The bottom position is for „normally closed “ configuration (shorted on RX).

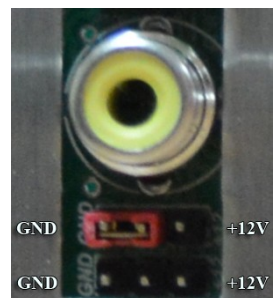
Delays can be programmed from the main configuration panel.

(2) PTT Outputs (No Delay) – white RCA connector

Jumpers to program the PTT Outputs are located below it's RCA connector socket. These outputs have no delay compared to the PTT Input.

The RCA jack can be configured for either:

1. Closure to Ground (left position)



BIJELA!!

2. +12V DC on Transmit (right position)

The top position is for „normally open “ configuration.

The bottom position is for „normally closed “ configuration (shorted on RX).

(3) FS (Foot Switch) – black RCA connector

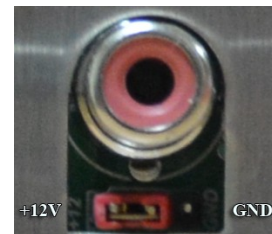
This RCA jack is a manual PTT input from a footswitch. This input always is looking for a closure to ground on transmit.

Foot switch line is isolated with opto-coupler

(4) PTT In (Generic)) – black RCA connector

This RCA jack accepts "PTT" input from any external device, such as a foot switch, a relay, or a line containing +5V or +12V DC from a USB keying device, or a PC interface.

PTT IN line is isolated with opto-coupler



BLACK!!

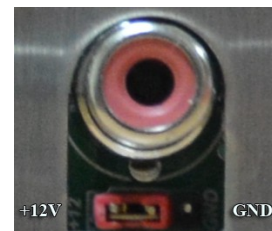
(5) Inhibit (Output) – red RCA connector

For blocking transmit capability of other transmitters, if the Inhibit Mode has been activated, use this output RCA jack. It's either +12V or GND. Jumpers to program this are located below it's RCA connector socket.



(6) SWR Alarm – red RCA connector

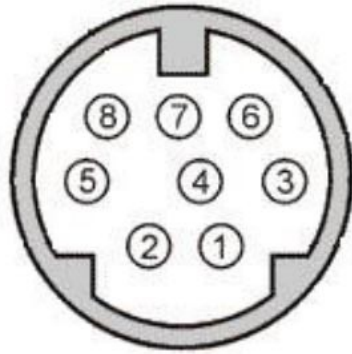
This input RCA jack can accept a "High SWR" alarm (or any other alarm state) from some external device (such as an antenna analyzer, amplifier, etc.) to block the transmitter from putting out any power. This input is expecting either +5V DC or a closure to ground (programmable via a jumper located below it's RCA connector socket).



SWR IN line is isolated with opto-coupler

(7) Band Data IN

This DIN connector accepts Band Data signals from a device capable of generating the appropriate BCD data. The connector is directly compatible with Yaesu Band Data jacks. Band data input lines are isolated with opto-coupler.



SAC XL connector Band Data Rear Panel

Pin 6 - GND

Pin 5 - A

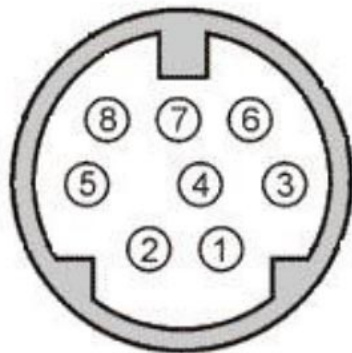
Pin 2 - B

Pin 1 - C

Pin 3 - D

(8) Band Data OUT

This DIN connector feeds Band Data out for use with linear amplifiers or other devices requiring the BCD data available on the Band Data control pins.



SAC XL connector Band Data Rear Panel

Pin 6 - GND

Pin 5 - A

Pin 2 - B

Pin 1 - C

Pin 3 - D

(9) AUX OUT

These DB9 female AUX sockets is used to connect the controller to the output module unit. It uses a pin to pin cable.

Cable has to has GND on DB9 metal CASE!

(10) Interlock

When you desire to have units under control of the SSC-XL interlocked, press this button . The blue "INT" LED on the front panel will now be interlocked.

(11) Prio (Priority)

Should you desire to define a priority level within your station (for example, to allow the "Multiplier" station to seize control), use this button. Three different Priority levels are available (1-3). Every time you click the button, priority is incremented. If the priority is 3, it will become 1 on the next click. Initial status is Priority 1!

(12) RJ-45

Use this jack to connect to a local switch/router in your station, and allow the SSC-XL to be a part of a local area network. TCP/IP is the main method of communication between SSC-XL controllers. All operate in the 10.0.0.0/24 subnet.

RJ-45 connector has galvanic isolation from uC circuit.

(13) ADR (DIP Switch)

DIP switch is used for configuring devices when working together in a network.

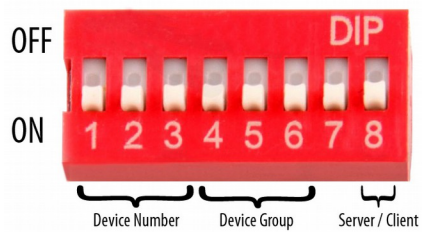
Down position indicates ON (logical 1).

DIP 1-3 define the device number.

DIP 4-6 define the group number.

DIP 7 does nothing in the default firmware.




DIP 8 defines if the device is in server or client mode.



Make sure you don't duplicate device numbers in the same group. (If you do, only the first device you turn on will work.)

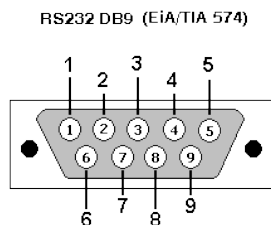
There can be 6 devices in a group, and a maximum of 6 groups.

Below is the table with all possible configurations.

DEVICE ADDRESS				GROUP ADDRESS				Server/ Client	
									
Device 1	1	0	0	Group 1	1	0	0	Client	0
Device 2	0	1	0	Group 2	0	1	0		1
Device 3	1	1	0	Group 3	1	1	0	Server	
Device 4	0	0	1	Group 4	0	0	1		
Device 5	1	0	1	Group 5	1	0	1		
Device 6	0	1	1	Group 6	0	1	1		

(14)/(15) RS232

These two DB-9 connectors may be used for CAT control, or for any other control purpose.



Three pins are used:

- 2 – RX
- 3 – TX
- 5 – GND

(16) DC 16V-18V

This 16V-18V DC connector is used to power the SSC-XL. Connect only to a DC power source capable of 1000 mA of current. Polarity can be whatever! Same connector can be supplied with 14V AC. SSC XL has power supply and wrong polarity protection circuit built in.

(17) USB

This jack may be connected to the optional keypad. Selecting of the device type is made by pressing the KYB/PC button appropriately.

USB connector is protected with dedicated protection IC.

(18) ANALOG Inputs (Not in use)

Additional hardware

Programming Keypad (optional)

The optional programming keypad allows the SSC-XL to operate as a stand-alone controller, without the need for a personal computer.

The optional programming keypad connects to the USB connector on the rear panel of the SSC-XL.

You will get 4 colour stickers, with numbering from 1 to 5, to create keyboard layout to fit your personal needs.

Any standard ASCII keyboard should work, but it is not guaranteed. Some keyboards are recognized as hubs by Windows. These will not work.



OUTPUT MODULE UNIT

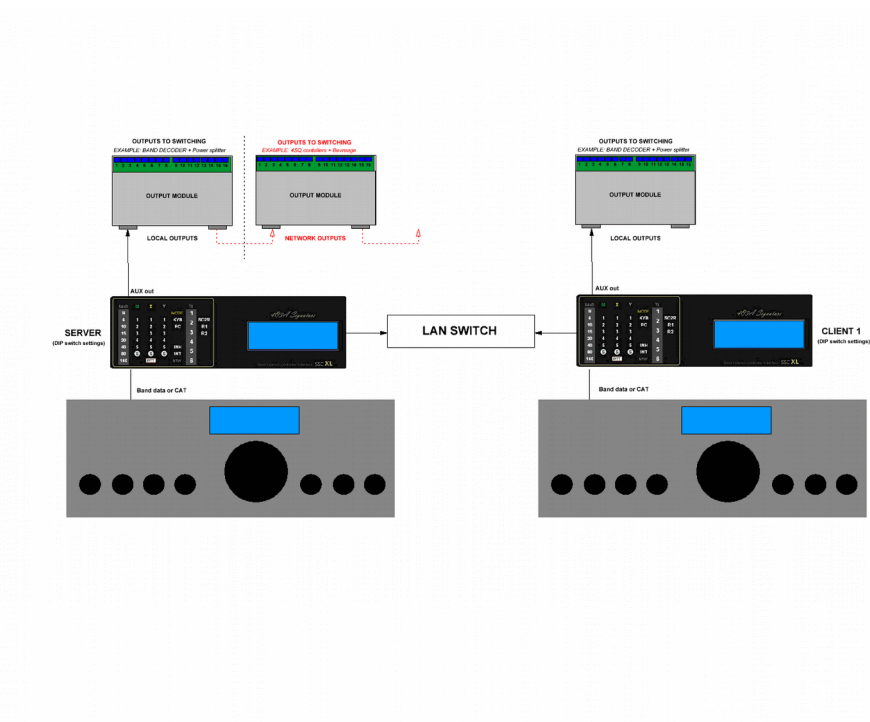
Relay output port
(2x8, GND, +12V or external)

Open collector GND port



Slika output module unit-a - Slika izlaznih potrova i jumpera na modulu

One output module unit comes with every device. Each has 16 outputs. Devices configured as „server “ can accept two more (three output module units total).



Each device directly controls it's output module.

Server device can accept two more (three total) output units.

As with a client device, the first module is controllable only from the master device directly.

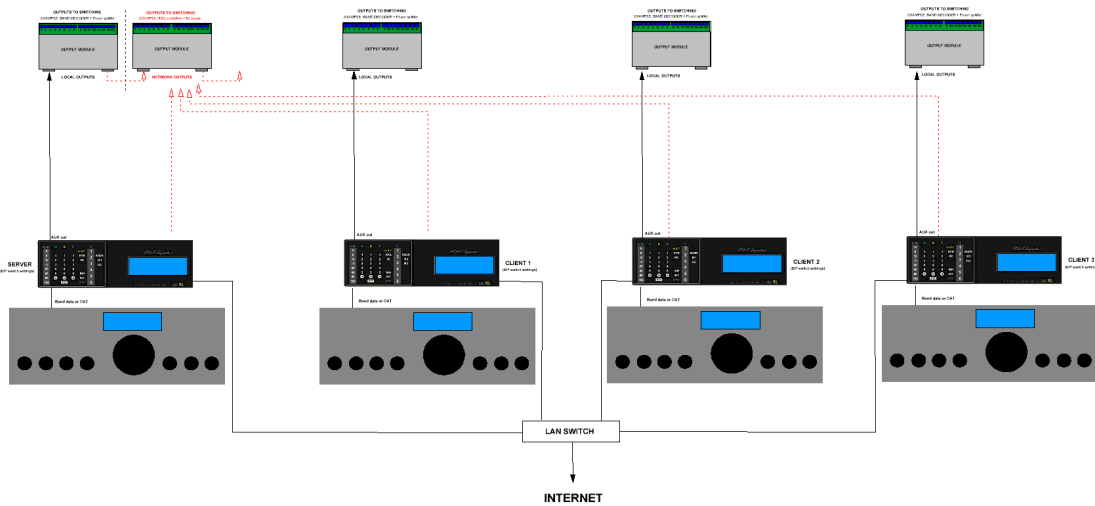
The two aditional units can be controlled via TCP/IP from any device on the network.

Getting started

Setup and Interconnections

A typical interconnection diagrtam is shown below, although there are almost infinite possibilities as to interconnectins, since the SSC-XL can control almost

anything in your station (including your coffee pot, if you like).



Four devices in network connected to output modules

A DC adapter is supplied with your SSC-XL. We recommend you always use it for powering the SSC-XL. We cannot guarantee full performance of the SSC-XL when using a different power source.

Should you elect to use an external DC power supply, it must provide 13.8 V DC at a minimum current of 1000 mA. The DC power cable's center pin is the +V line, and the outer ring is the negative line. Be absolutely certain not to reverse the DC supply voltage. Our limited warranty does not cover damage caused by improper supply voltage, or by reversed DC voltage, or from the application of AC voltage of any kind.

Setting up, your first configuration

1. Connect the supplied DC power cable (from the power adapter) to the rear panel of the SSC-XL.
2. Connect the SSC-XL to your PC with the USB cable.


SSC XL Configuration Panel

Download link:

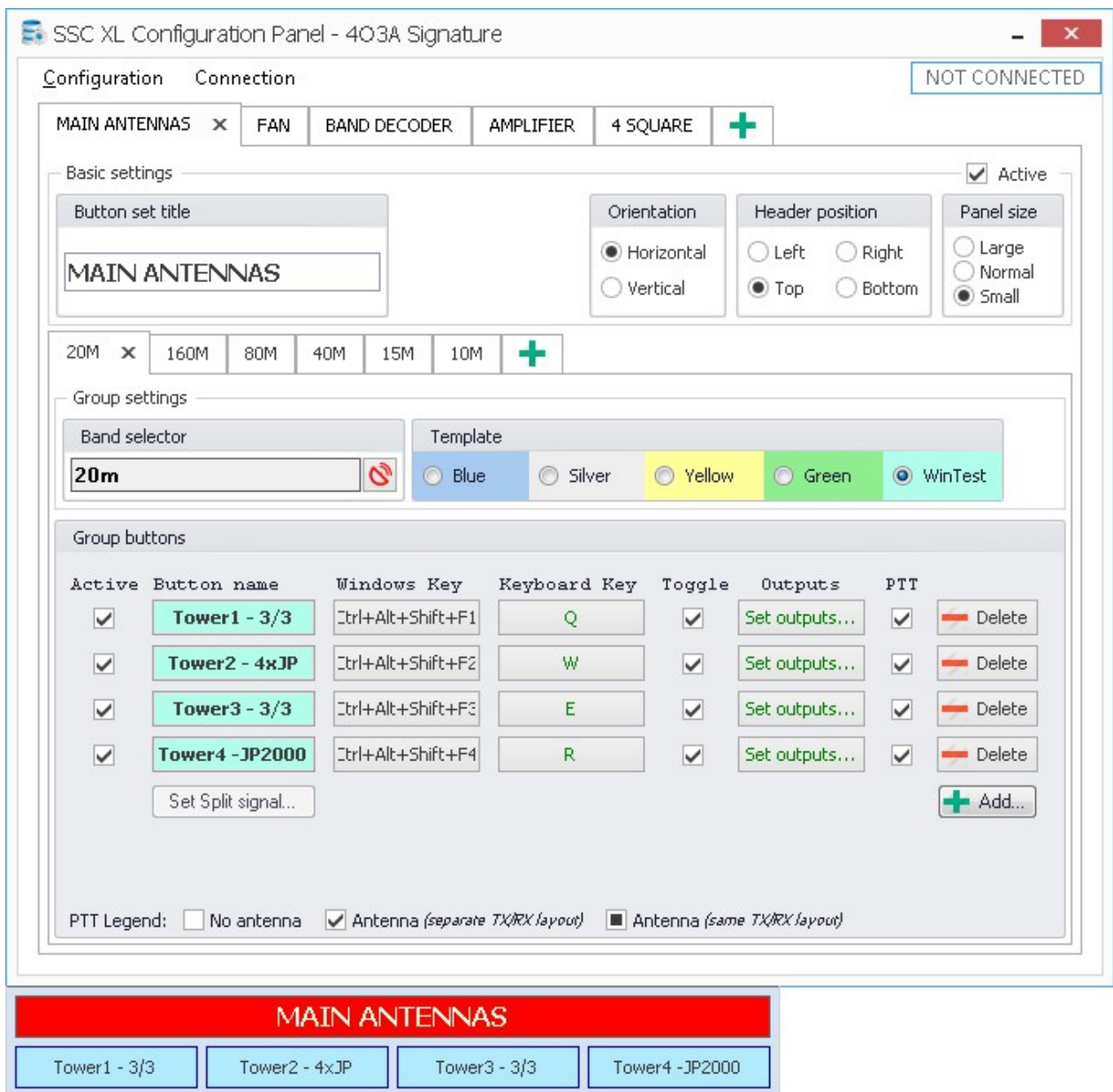
<http://4o3a.com/index.php/downloads>

Follow the simple installation instructions, there are no authentication mechanisms.

This is an overview of 4O3A SSC XL Configuration Panel software. It is the main documentation of its features. We will go over its features, using a sample configuration as an example

In case you accidentally hide your window, you can restore its visibility by double clicking the application icon, , in the lower right corner of your screen (sysTray).

This is an example of a Server configuration:

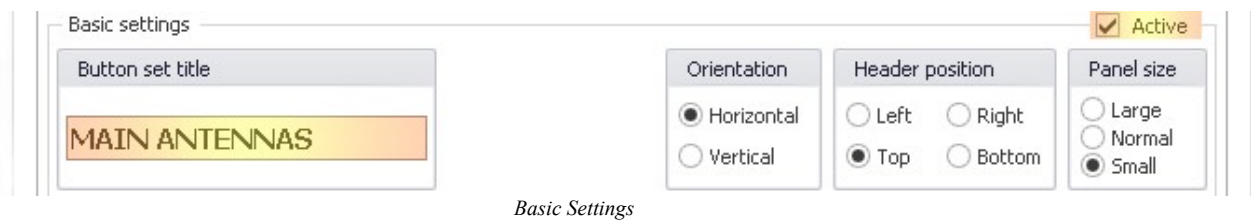


Example Server Configuration

You define groups of buttons for various switching. Multiple groups of buttons can be active at the same time. You add groups of buttons by clicking the + icon:



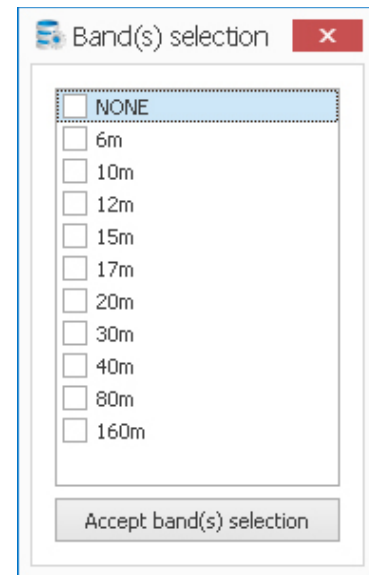
Set the name of your button group by entering it in the text box. Orientation, Header Position and Panel size define the visual appearance of the group. You can enable or disable your group at any time by using the Active checkbox. Once disabled, your group will disappear from screen:



Start adding buttons by clicking the next + icon:



You can have different button layouts for different bands. When connected (properly) to an SSC XL, the software will automatically recognize band changes on your station. You can have completely different button sets on each band. They can also overlap (selecting multiple bands for a button group). If no band is selected, the button group will be always visible regardless of the current band. See chapter “Home automation” for more details. While not connected to a station, you can manually change band by a menu, right clicking the 📶 icon. (for configuration purposes)



Start adding buttons by clicking the + Add icon:

Group buttons

Active	Button name	Windows Key	Keyboard Key	Toggle	Outputs	PTT	
<input checked="" type="checkbox"/>	Tower1 - 3/3	Ctrl+Alt+Shift+F1	Q	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete
<input checked="" type="checkbox"/>	Tower2 - 4xJP	Ctrl+Alt+Shift+F2	W	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete
<input checked="" type="checkbox"/>	Tower3 - 3/3	Ctrl+Alt+Shift+F3	E	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete
<input checked="" type="checkbox"/>	Tower4 - JP2000	Ctrl+Alt+Shift+F4	R	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete
<div>Set Split signal...</div> <div>Add...</div>							

PTT Legend: ☐ No antenna ☒ Antenna (separate TX/RX layout) ☐ Antenna (same TX/RX layout)

Add buttons

Active checkbox toggles if your button is currently enabled:

Active	Button name	Windows Key	Keyboard Key	Toggle	Outputs	PTT	
<input checked="" type="checkbox"/>	Tower1 - 3/3	Ctrl+Alt+Shift+F1	Q	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete

Active checkbox

Type the name of your button name into the button name text box:

Active	Button name	Windows Key	Keyboard Key	Toggle	Outputs	PTT	
<input checked="" type="checkbox"/>	Tower1 - 3/3	Ctrl+Alt+Shift+F1	Q	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete

Button name

Click on the windows key box to set a globally available shortcut for using this button:

Active	Button name	Windows Key	Keyboard Key	Toggle	Outputs	PTT	
<input checked="" type="checkbox"/>	Tower1 - 3/3	Ctrl+Alt+Shift+F1	Q	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete

Windows Key

Keyboard key is a single character from an external keyboard. It is a shortcut for the button use when a USB keyboard is attached to the device. You **have to define it** even if you do not intend to use an external USB keyboard:

Active	Button name	Windows Key	Keyboard Key	Toggle	Outputs	PTT	
<input checked="" type="checkbox"/>	Tower1 - 3/3	Ctrl+Alt+Shift+F1	Q	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete

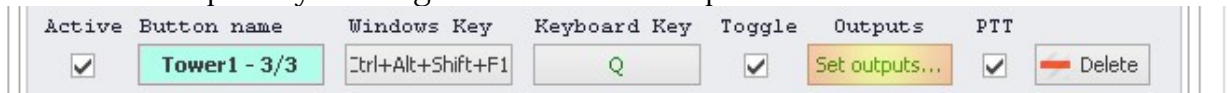
Keyboard Key

Uncheck toggle if you want to deactivate all other buttons in the group when using this one. If toggle is checked, then this button can be used at the same time with multiple other buttons from the group, configured in the same way:

Active	Button name	Windows Key	Keyboard Key	Toggle	Outputs	PTT	
<input checked="" type="checkbox"/>	Tower1 - 3/3	Ctrl+Alt+Shift+F1	Q	<input checked="" type="checkbox"/>	Set outputs...	<input checked="" type="checkbox"/>	Delete

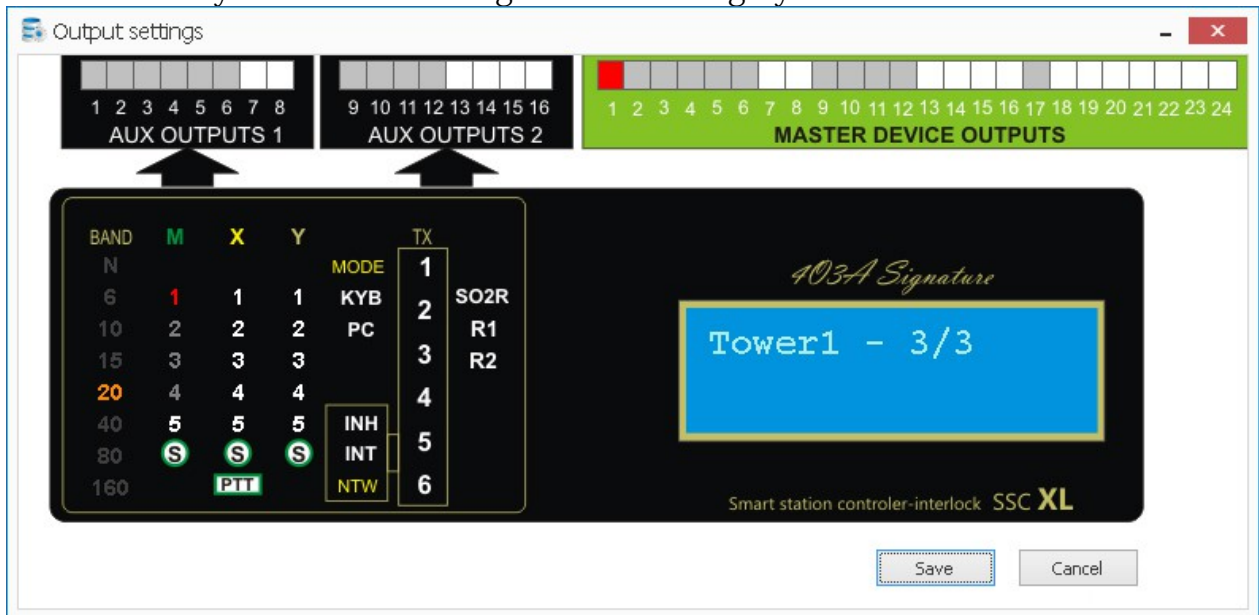
Toggle checkbox

You can set outputs by clicking the set desired outputs icon:



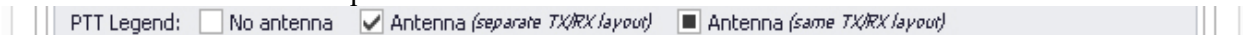
Set outputs

A menu will pop up, where you can select desired outputs. You use one or multiple relays per button on the connected board(s). You can select a single LED from M, X or Y group as an indication of pressed button. LEDs and relays that are already in use in the configuration will be grayed out:



Output settings window

PTT checkbox has three possible states:

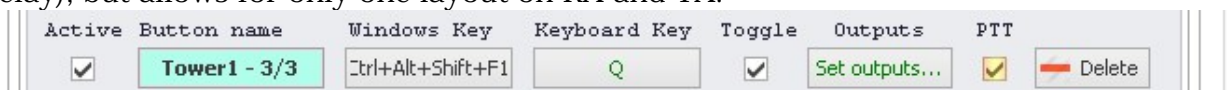


PTT legend

If unchecked, there will be no output on PTT ports, only the appropriate relay will be turned on.

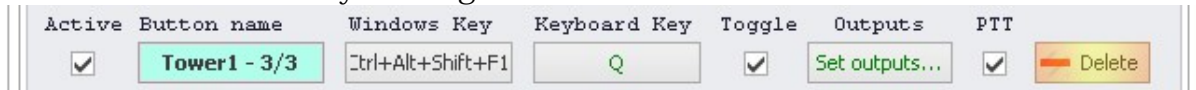
If checked, there will be normal output on PTT ports, as well as the appropriate LED. You can also toggle between two different layouts, one for receiving, one for transmitting. This allows use of different antenna layouts for receiving and transmitting.

If checked with a black square, it acts the same as regularly checked (PTT + relay), but allows for only one layout on RX and TX:



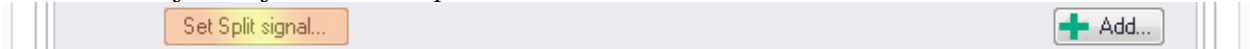
PTT checkbox

You can delete buttons by clicking delete:



Delete button

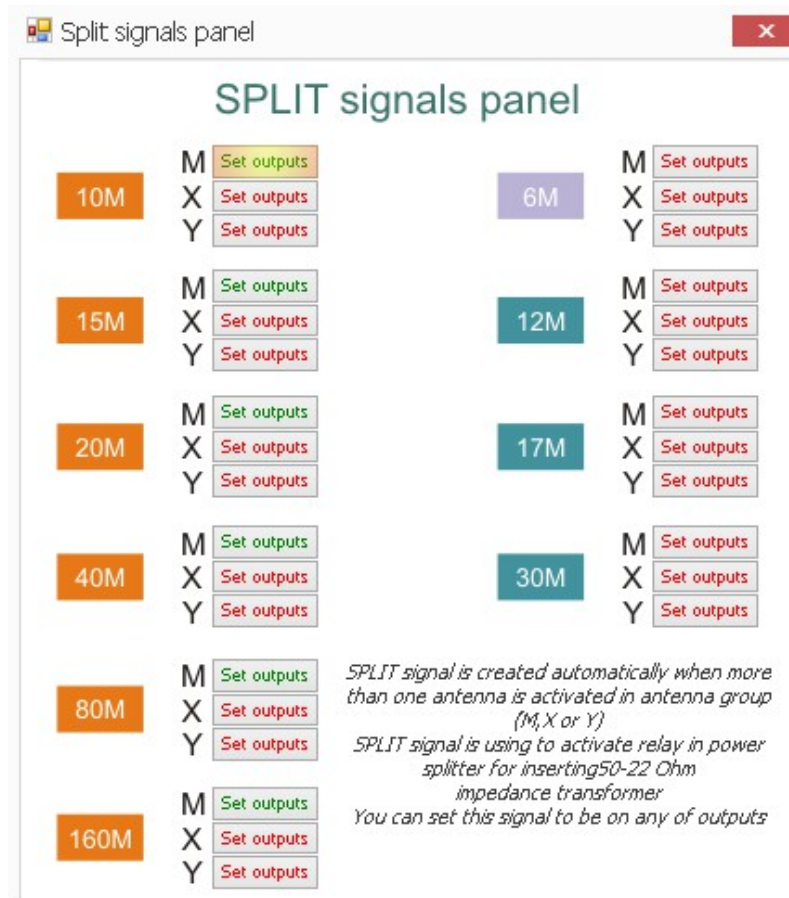
If you set split signal, your antenna splitter will activate impedance transformer automatically every time multiple antennas are active:



Set split signal

Alternatively, you can use Configuration -> Split Signals

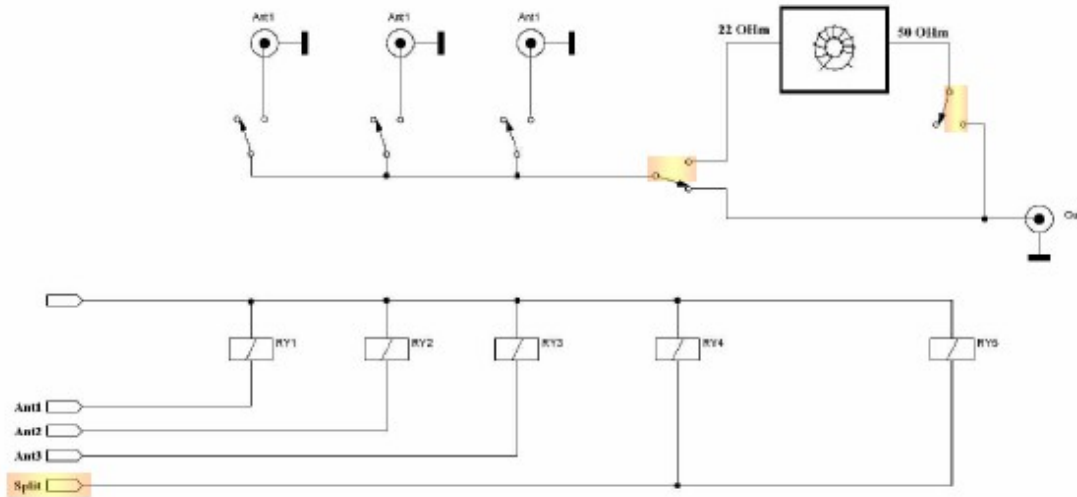
Choose the relay to what your splitter is connected. The S LED on the device will indicate that split signal is active. Up to three possible splitters per group (M, X, Y)



Split signal window

Below is the schematic of the power splitter, with the Split signal relay marked.
Split signal will activate relays marked with yellow:

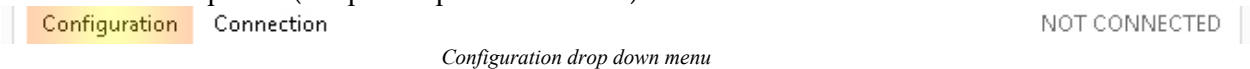
POWER SPLITTER /STACK MATCH FOR SAC-X



Power splitter schematic

CONFIGURATON MENU

From the configuration menu, you can create new configurations, save existing on the hard drive, or upload a configuration to the controller. You can also configure your device IP address, COM port settings, define split signals, and create band reports (output is pure text files):



Configuration drop down menu

Set up your IP / COM protocol parameters in  Device Settings

You can select your radio by name if supported in the current version, and the COM parameters will be automatically set. More models will be added with every new version, so make sure you update. If you know COM settings some unsupported devices might, but do not necessarily have to work, because the protocols below seem to vary.

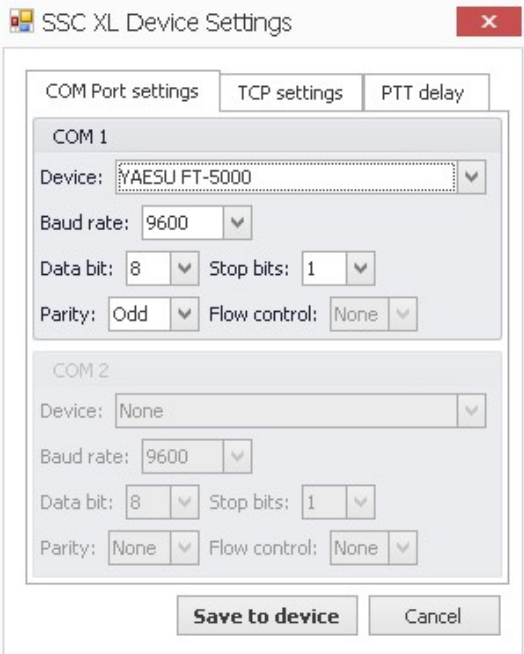
Please contact us for any specific requests via email: support@4o3a.com

Note that Automatic IP does not mean you can use DHCP to assign addresses.

Automatic IP means that the address will be defined based on DIP switches on the back, and that means it will be in the 10.0.0.0/8 IP range.

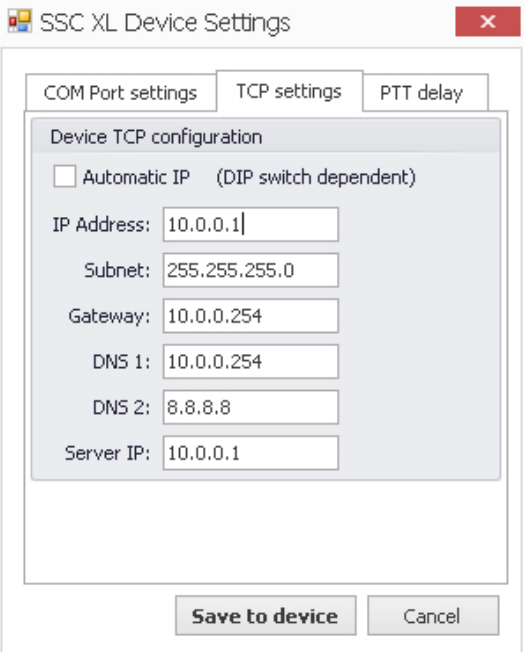
You can specify custom addresses if you like. In case of **server**, the **IP Address** and **Server IP** have to be the **same**.

If you are setting a client, you have to enter the correct server IP for each client device.



The screenshot shows the 'SSC XL Device Settings' window with the 'COM Port settings' tab selected. It contains two sections: 'COM 1' and 'COM 2'. 'COM 1' is configured with Device: 'YAESU FT-5000', Baud rate: '9600', Data bit: '8', Stop bits: '1', Parity: 'Odd', and Flow control: 'None'. 'COM 2' is configured with Device: 'None', Baud rate: '9600', Data bit: '8', Stop bits: '1', Parity: 'None', and Flow control: 'None'. At the bottom are 'Save to device' and 'Cancel' buttons.

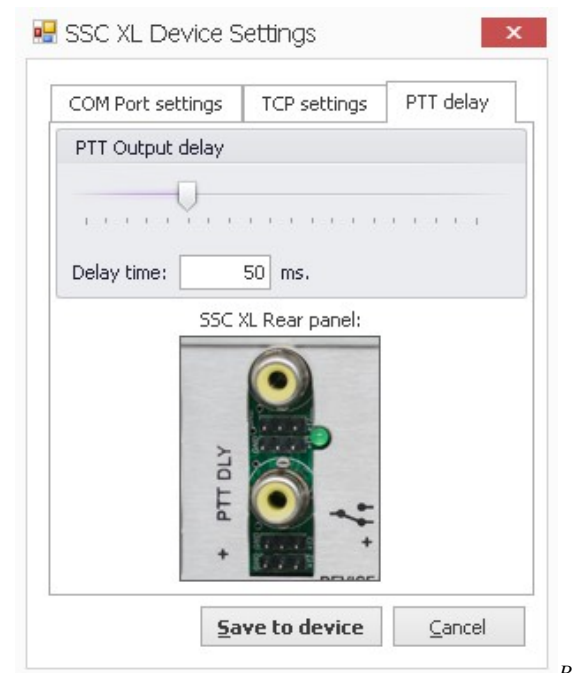
COM port settings



The screenshot shows the 'SSC XL Device Settings' window with the 'TCP settings' tab selected. It contains a 'Device TCP configuration' section with a checkbox for 'Automatic IP (DIP switch dependent)' which is unchecked. Below this are input fields for IP Address (10.0.0.1), Subnet (255.255.255.0), Gateway (10.0.0.254), DNS 1 (10.0.0.254), DNS 2 (8.8.8.8), and Server IP (10.0.0.1). At the bottom are 'Save to device' and 'Cancel' buttons.

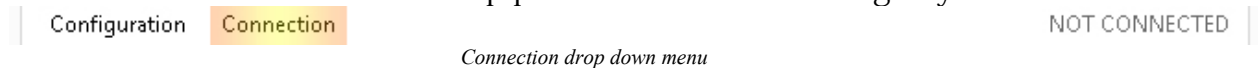
COM port settings

Set the desired PTT delay using the bar or by entering the value in the text box.
The value is in milliseconds.



PTT delay settings

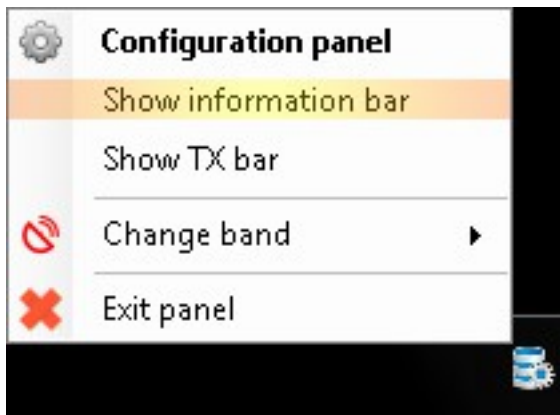
Use the connection menu to set up parameters for connecting to your controller:



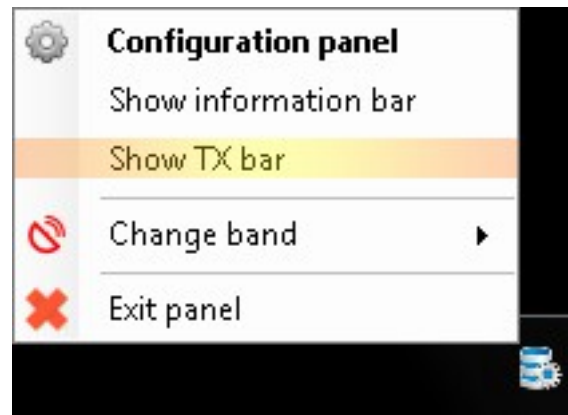
Connection drop down menu

You can choose to control your SSC XL via USB or TCP from this menu. TCP is used for remote control from anywhere, assuming you have internet access and have set up **port forwarding** on your local router.

There are two more windows you can show / hide at any moment by using the right click menu on the icon in the corner of the screen: 🖱️

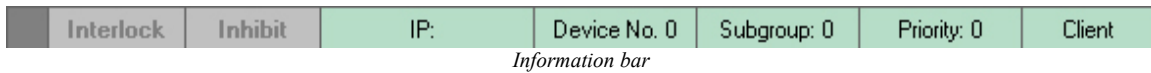


Show information bar



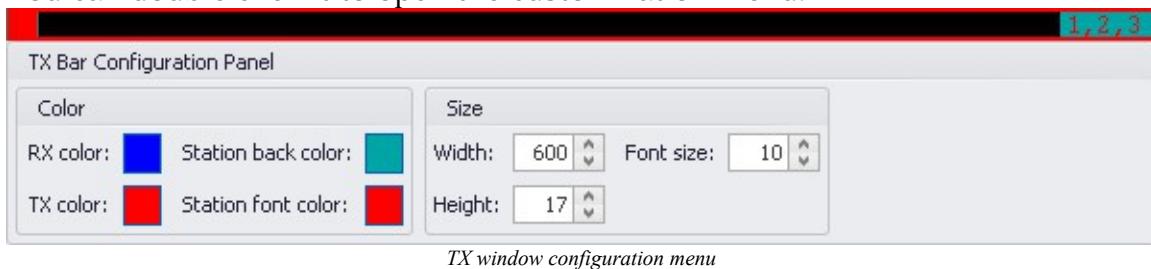
Show TX bar

Information bar shows you all relevant information in a window instead of looking at the SSC XL device. Left click and hold the first square on the left to move it around:

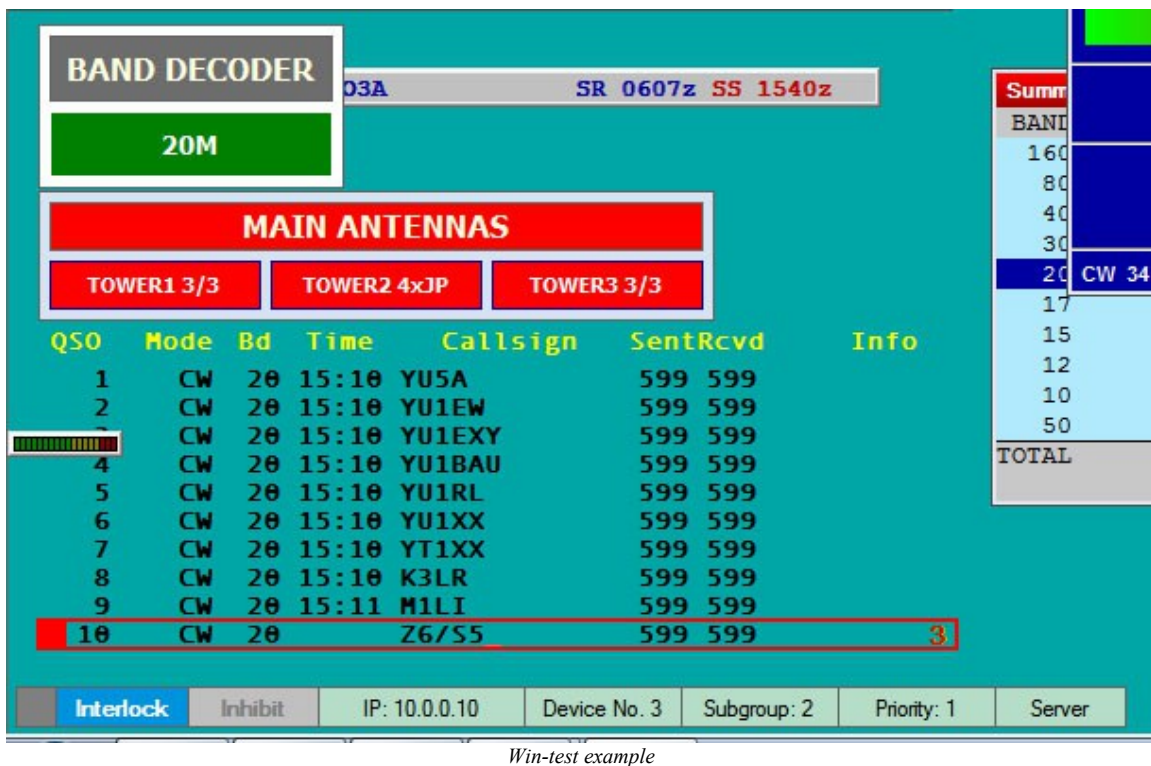


TX bar is a small square that lets you know if TX is active: 

You can double click it to open the customization menu:



These are designed for use with programs such as Win-test:



Firmware upgrade mode

In a few easy steps, you can enter firmware upgrade mode, and use it to install new functionality via software upgrades.

Download the firmware upgrade program and the latest firmware here:

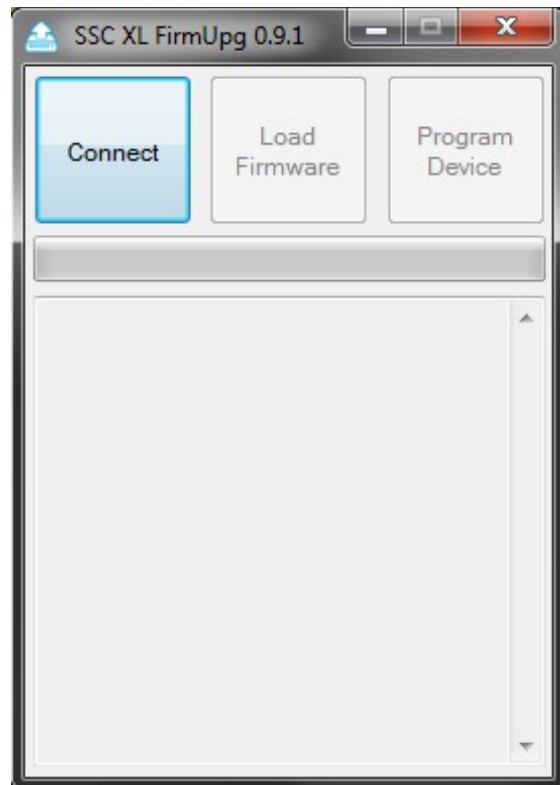
<http://4o3a.com/index.php/downloads>

You will need:

1. The SSC-XL Station Controller
2. The firmware upgrade application (link)
3. A USB cable (A->B)
4. A Windows PC, and the desired firmware (link)

The steps:

1. Connect your SSC-XL Controller to the PC with the USB cable
2. Turn the controller off, and unplug every cable, including the USB!
3. Hold the interlock (IL) button on the back of the device, and plug the AC and USB cables back in.
4. Open the firmware upgrade application
5. Press connect
6. Load the firmware file of your choice
7. Program the device



Home Automation

You can use SSC XL for controlling any piece of equipment, and not just radio, such as a sauna, lights, heating, doors etc. The creation process is the same, except you need to select no band.



Home automation example