Configuration and Operation manual

Kronback tracers X16

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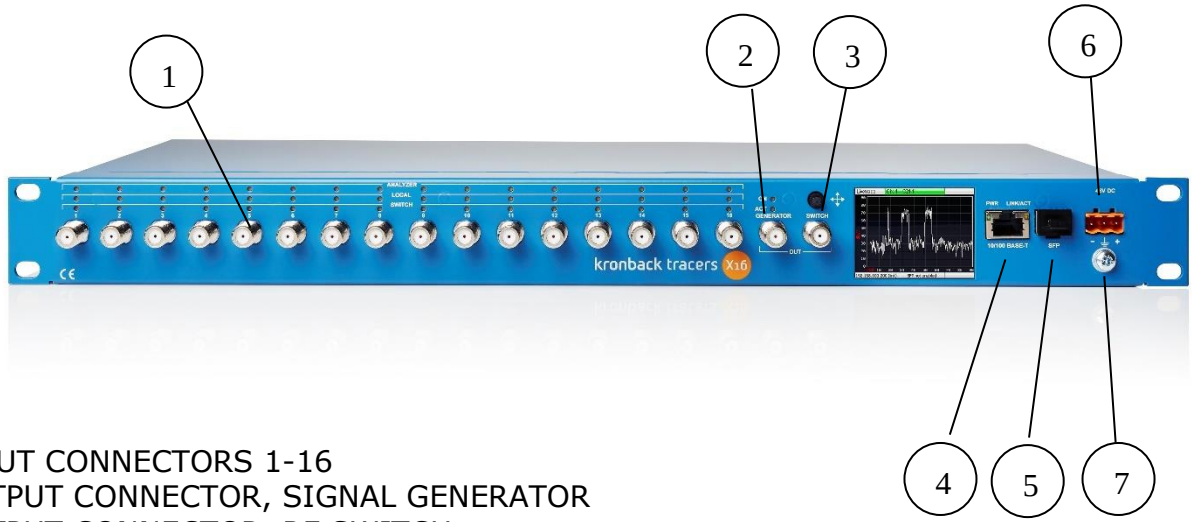
1. Physical connections



1 INPUT CONNECTORS 1-16
2 OUTPUT CONNECTOR, SIGNAL GENERATOR
3 OUTPUT CONNECTOR, RF SWITCH
4 10/100 NETWORK CONNECTOR
5 SFP GbE STREAMING OUTPUT
6 48V DC CONNECTOR
7 GROUND TERMINAL

1.1. Input connector and LED

The 16 F-type inputs connectors are mechanically fixed in the chassis front by a double D-cut hole.
The connectors can withstand torques > 4,5 Nm (40 lb*inch)

Maximum input level within the **X16** is 110dBuV.

Over each connector are three red LED that indicates the activity of each input. Each input can have 3 activities.

The **ANALYZER** LED is used to indicate that the input is being used for an internal measurement, such as LIVETRACE or quality monitoring.

The **LOCAL** LED is active if the input is being displayed on the LCD display.

The **SWITCH** LED is active if the input is switched to the RF SWITCH OUT connector

All input connectors are DC blocked up to 100V

All F-connectors are high quality CABLECON type.

1.2. OUTPUT CONNECTOR, SIGNAL GENERATOR

The GENERATOR output connector sends out a signal from the internal DAC circuit of the X16. The maximum level is 110 dBuV. A number of different types of signals can be generated by the X16.

1.2.1. Signal types

Various signal types can be generated:

Signal type	Frequency	Max Level		Used for
Single CW	3-1200 MHz	110 dBuV		Sweep
Dual CW	3-1200 MHz	100 dBuV		Network alignment
FSK	3-900 MHz	110 dBuV	Baud 9.6kHz to 38.4 kHz	P4i communication and HMS
GFSK	3-900 MHz	110 dBuV	50KHz	Proprietary HFC transponder communication

Note. The DAC inside X16 is a direct-DAC type covering the full CATV spectrum up to 1200 MHZ, and other types of signals could be generated on request.

The levels in the above table are maximum levels. An internal step attenuator can attenuate the signal up to 30dB in 0.5 dB steps. Furthermore, the DSP unit inside the X16 can also attenuate the signal further xx dB. It is necessary to attenuate using the DSP in the case that the dual CW needs to be tilted, or if 30 dB attenuation is not sufficient.

Over each connector are two red LED that indicates the activity of each input. Each input can have 3 activities.

The **ON** LED is used to indicate that the internal DAC circuitry is enabled and ready to transmit

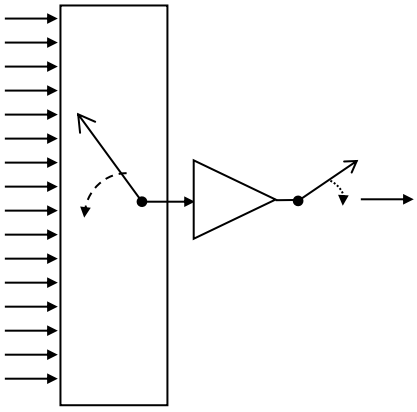
The **ACT** LED is active and that a signal is present on the output.

1.3. OUTPUT CONNECTOR, RF SWITCH

The RF SWITCH output connector transmits one of the input 1 to 16 signals.

Since the internal switch is a SP16T type, only 1 input can be selected at a time. The switch does not function as a switchable multi-combiner.

An ALL-OFF mode disconnects all inputs and ensures that none of the 16 inputs are transmitted.



To ensure unity gain between each inputs and the output, an internal wideband amplifier is buffering the signals. The frequency range of the switch is 3 to 1200 MHz.

The input that should be switched can be selected from the local LCD display using the joystick. The switch can also be remote controlled from the web interface of the **X16**, or by a proprietary protocol via a TCP/IP socket connection.

The socket protocol used for remote control is similar to the one used by the Kronback Tracers **S16** RF switch product.

There are no LED associated with the switch output, but one of the 16 **SWITCH** LED's will light if an input is connected. If no LED is lighting then the switch is in ALL-OFF mode.

1.4. Network Connector

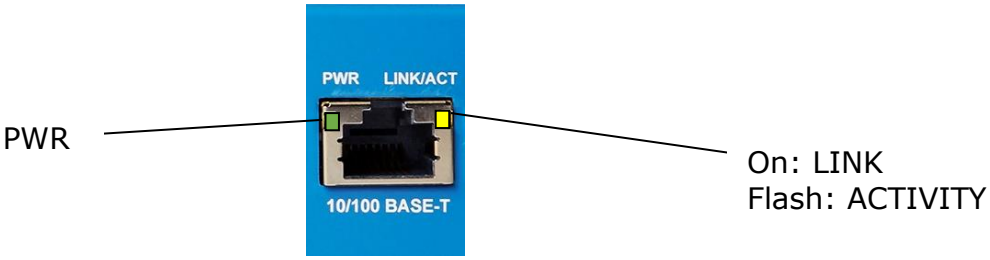
There are two network connectors at the front of the X16. One 10/100 BASE-T and one slot for a SFP module.

The 10/100 BASE-T is used for remote management and WEB access of the X16.
The SFP module is dedicated for data streaming of RTP-DVB private data.

The RJ45 Network connector is supporting 10 or 100 Mbit/s link speed, and half or full duplex.
MDIX is supported for both straight and crossed twisted-pair cables

1.4.1. LED indicators

The top left LED (green) indicates that the X16 is powered on.
The top right LED (orange) when lighting indicates that Link to the X16 is established.
The top right LED (orange) when flashing indicates that data is transmitted or received.



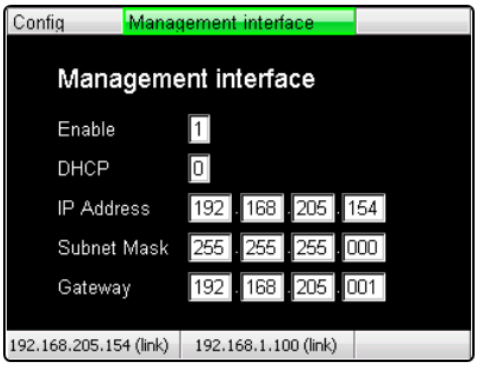
1.4.2. Setting the IP parameters

There are two ways to setup the IP parameters of the X16 10/100 BASE-T management port. Either by using the LCD display or from the WEB user interface.

1.4.2.1. IP setup using the LCD display.

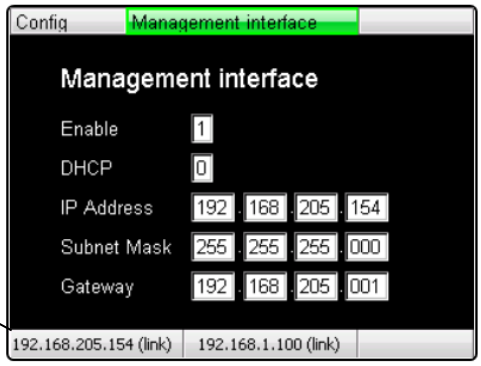
The IP address can be setup with the LCD display and its associated joystick

Navigate to the CONFIG→Management Interface menu.



Parameters to be set are:
Enable
DHCP on/off
IP-ADDRESS
SUBNET MASK
GATEWAY

IP ADDRESS and LINK status for 10/100 BASE-T



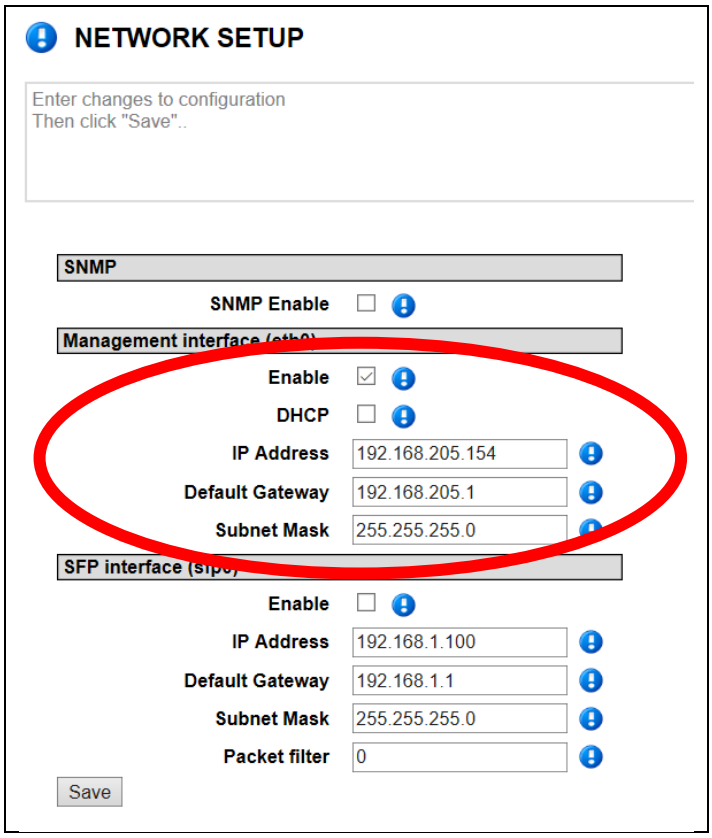
After setting up the parameters the X16 must be rebooted.
This is done from the main menu of the LCD display.

The actual IP address and LINK status are always present in the bottom of the LCD display.

1.4.2.1. IP setup using the WEB user interface.

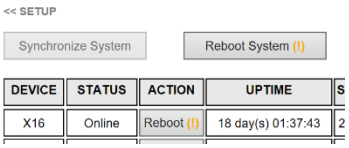
The IP address can be set from the WEB user interface

Navigate to the SETUP→NETWORK→10/100 BASE-T menu.



After the parameters has been entered, click the SAVE button.
The Device status window reports that the X16 needs to be rebooted:

To reboot the X16 go to the SETUP→HARDWARE menu and click Reboot



After the reboot has been performed, the X16 report OK in the system status.

Note. Since the IP address is changed, the browser window has to be reassigned with the new IP address before the system status can be verified.

1.5. SFP Connector

There are two network connectors at the front of the X16. One 10/100 BASE-T and one slot for a SFP module.

The 10/100 BASE-T is used for remote management and WEB access of the X16.
The SFP module is dedicated for data streaming of RTP-DVB private data.

1.5.1. Supported SFP modules

Both electrical and optical SFP modules are supported for GbE connectivity.

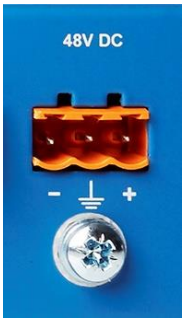
1.5.2. Enabling the SFP module

Before use the SFP module needs to be enabled. This can be done from the LED display or from the WEB user interface. In both cases, navigate to the same menu as for the IP settings.

1.5.3. Setting the IP parameters

There are two ways to setup the IP parameters of the SFP module. Either by using the LCD display or from the WEB user interface.

1.1. Power Inlet



The **X16** accepts a nominal 48V DC power source from 36V to 75V.

The + and – poles of the connector are galvanic isolated from the internal of the X16.

The center pole of the connector and the ground termination screw are connected to the and the chassis ground of the X16.

Note **Proper grounding is critical to avoid hazard and to avoid damaging equipment due to voltage differences.**

1.1.1. Fuse

The X16 is equipped with an internal auto Fuse of 0,6A

1.1.2. Power connector

The Power connector is a Weidmüller type 1510460000, PCB plug-in Male connector, Pitch: 5.08 mm, No. of poles: 3

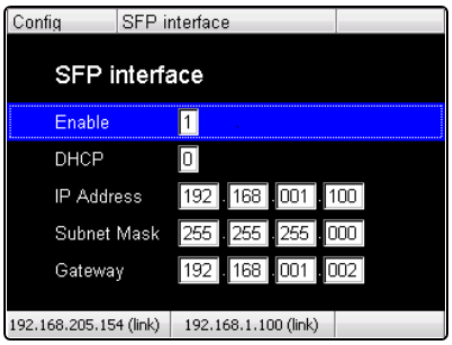
1.1.3. Mating connector

A suggested mating connector is: Weidmüller 1707700000 - Pluggable Terminal Block, 5.08 mm, 3 Ways, 2.5 mm², Clamp.
It can be purchased at www.farnell.com, item number 1866608

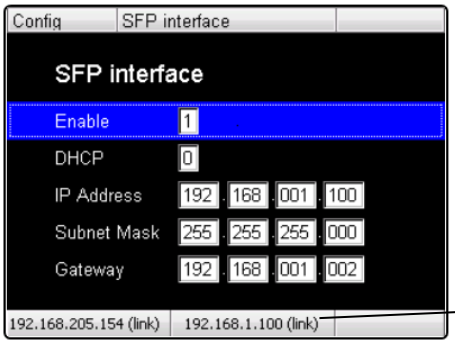
1.1.3.1. IP setup using the LCD display.

The IP address can be setup with the LCD display and its associated joystick

Navigate to the CONFIG→ETHERNET→SFP menu.



Parameters to be set are:
ENABLE on/off
DHCP on/off
IP-ADDRESS
SUBNET MASK
GATEWAY



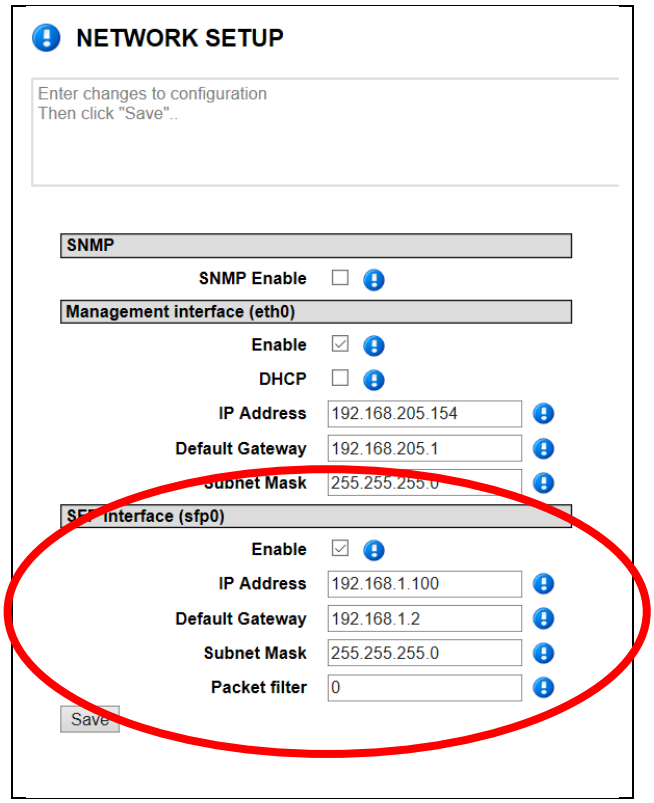
After setting up the parameters the X16 must be rebooted.
Rebooting is done from the main menu of the LCD display.

The actual IP address and LINK status are always present in the bottom of the LCD display.

1.1.3.2. IP setup using the WEB user interface.

The IP address can be set from the WEB user interface

Navigate to the SETUP→SFP menu.



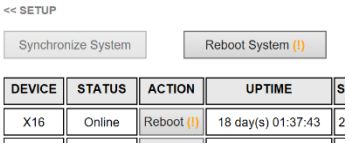
Enable
When selected the enable field activates all the hardware inside the X16 that involves the SDP module.

Packet Filter Mode
The SFP interface has a filtering function to ensure that inbound network traffic can be blocked.
The filter only accepts ARP and ICMP (ping) traffic.
Outbound traffic, such as DVB RTP streaming is always allowed.
This ensures that the X16 can always transmit its DVB RTP data to an EDGE QAM without being disturbed by inbound broadcast traffic.

Note. The IP address of the SFP module must be in a different IP subnet from the 10/100 BASE-T management interface.

After the parameters has been entered, click the SAVE button.
The Device status window reports that the X16 needs to be rebooted:

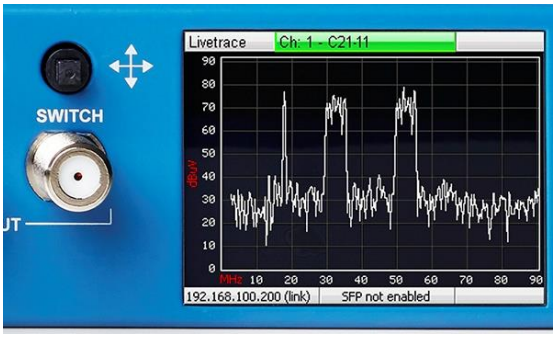
To reboot the X16 go to the SETUP→HARDWARE menu and click Reboot



After the reboot has been performed, the X16 report OK in the system status.

Note. Since the IP address is changed, the browser window has to be reassigned with the new IP address before the system status can be verified.

1.1. LCD display



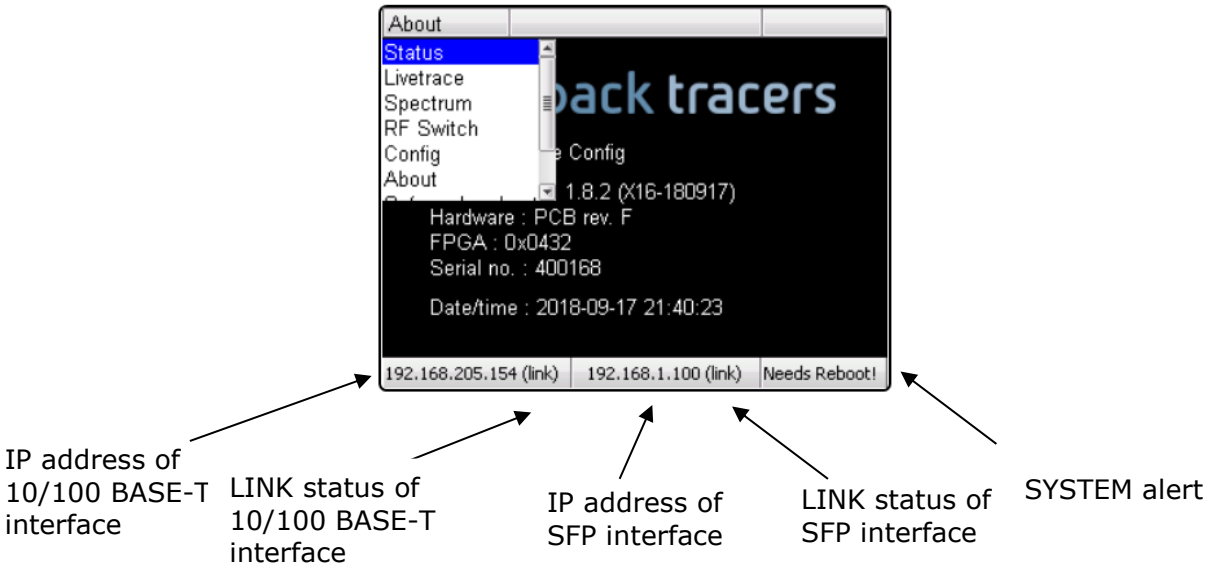
The LCD display and its associated joystick is used for configuration and monitoring.

The joystick is used to

- navigate through the menus
- set values.

With the joystick 5 selections can be made: UP, DOWN, LEFT, RIGHT and PUSH.

From the starting point in the top left part of the screen a fold out menu will appear when selecting the DOWN key.

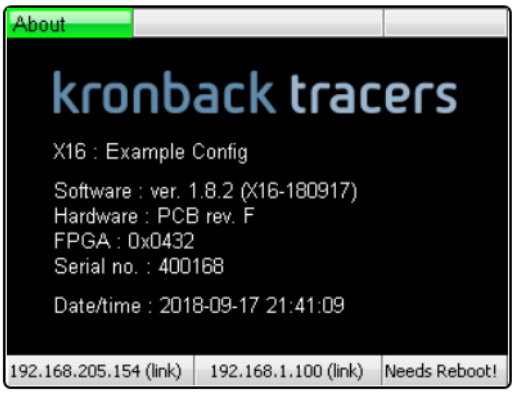


Selecting a sub menu is done by pushing the joystick or selecting the RIGHT key.

1.1.1. Menu tree structure

1) About
2) Livetrace
   (a) Channel select
3) Spectrum
   (a) Channel select
   (b) settings
4) RF Switch
5) Config
   (a) Management Interface
   (b) SFP Interface
   (c) Show web passwords
6) About
7) Reboot
8) Safemode Reboot

1.1.2. About



The About screen shows main hardware and software revision information.

X16: The system name of the X16.
This can be set from the SETUP→SYSTEM web menu.

Software: version of the embedded software version in the ARM processor

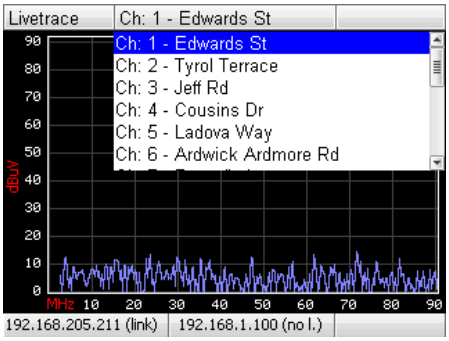
Hardware: The hardware version of the X16 PCB

FPGA: Version of the FPGA image

Serial: Serial number of the X16 unit

Date/time the current time setting of the X16

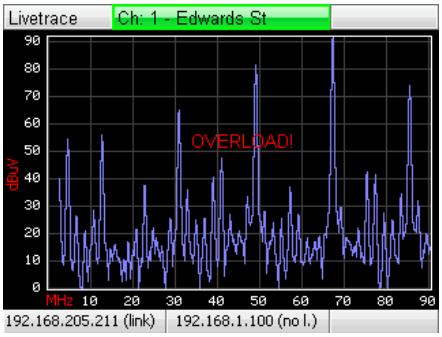
1.1.3. Livetrace



The livetrace display will show the current spectrum of one of the selected inputs.

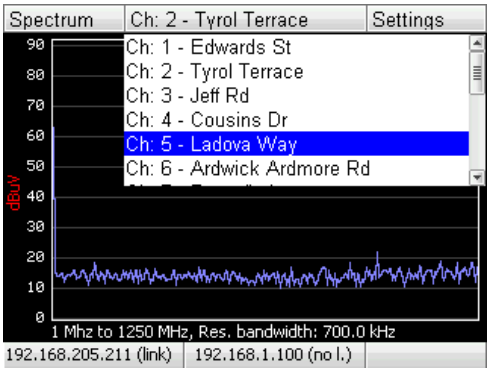
The span of the Livetrace view is fixed 5 MHz to 85 MHz and is primarily used to display return path signals.

Overload
An overload text will be displayed if the input signal is exceeding the accepted range of the ADC converter inside the X16.



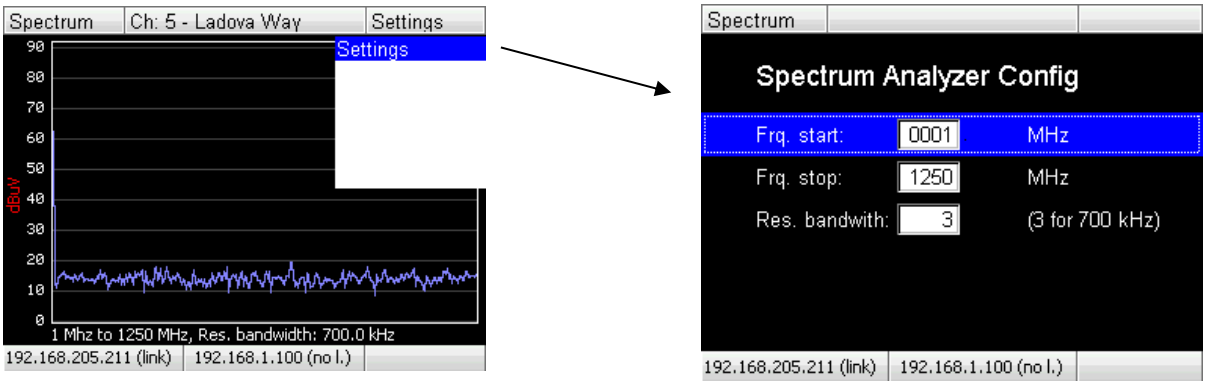
1.1.4. Spectrum

The spectrum view is a full bandwidth range spectrum analyser with variable span between 1 and 1250 MHz



The current start and stop frequency and Resolution bandwidth is displayed under the spectrum graph.

Enter the settings menu change the start, stop frequency and resolution bandwidth



The frequency start field specifies the start frequency of the spectrum graph can be set from 1 to 1250 and must be an integer value.

The frequency stop field specifies the stop frequency of the spectrum graph can be set from 1 to 1250.and must be an integer value.

The start frequency must always be lower than the stop frequency.
The start and stop frequency must not be identical. Zero span is not a valid functionality of this spectrum analyser.

1.1.4.1. Resolution bandwidth

The resolution bandwidth can be set in 7 steps:

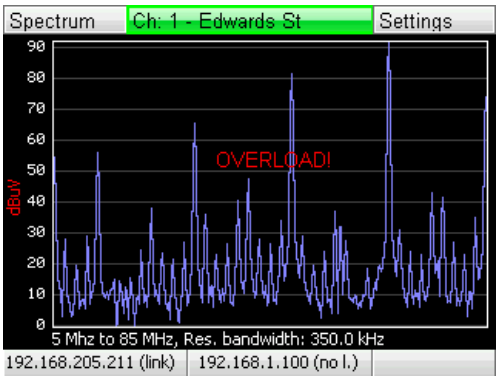
RBV value	RBW
0	5.6 MHz
1	2.8 MHz
2	1.4 MHz
3	700 kHz
4	350 kHz
5	175 kHz
6	67,5kHz

1.1.4.2. Maximum level.

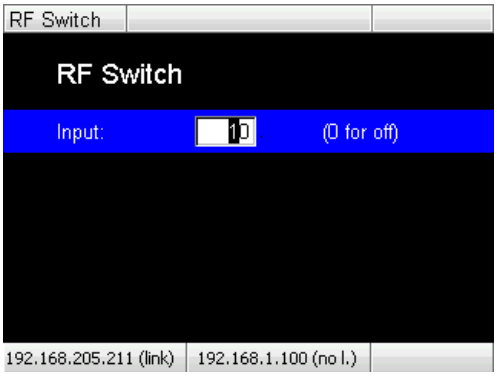
Setting the maximum signal level that the spectrum analyser can accept before overload is not a part of the settings menu in the LCD display. The maximum level must be set from the SETUP→CHANNEL menu of the X16 web site. The maximum value can be set to between 90 and 120 dBuV

1.1.4.3. Overload

An Overload text will be displayed if the input signal is exceeding the accepted range of the ADC converter inside the X16.



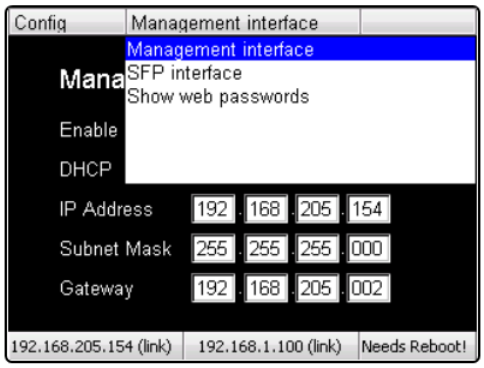
1.1.5. RF switch



The Input field selects which input that is sent to the RF switch output connector on the front panel of the X16. The value is between 01 and 16.
Enter a 00 to disable the RF switch.

For more details of the CW generator, please refer to the section 1.3 of this manual.

1.1.6. Config



1.1.6.1. Management Interface

For instructions on changing the Ethernet configuration using the LCD display please refer to section 1.5 of this manual

1.1.6.2. SFP interface

For instructions on changing the SFP network interface configuration using the LCD display please refer to section 1.6 of this manual

1.1.6.3. Show web passwords.

Using this menu, passwords to enter the web interface can be retrieved:

2. Specifications

2.1. RF specifications

2.1.1. Input 1 – 16

- Connector: F-type 75 ohm, AC coupled, 100V DC isolation
- Frequency response: 3-1218 MHz
- Return loss return path: >18dB
- Return loss downstream: 18dB@40 MHz, - 1.5 dB/oct
- Isolation: >60 dB

2.1.2. OUTPUTS - GENERATOR AND SWITCH

- Frequency range: 3-1218 MHz
- Frequency steps: 10 kHz
- Frequency error: <5 kHz
- Level range: 30 dBuV - 100 dBuV
- Level steps: 1 dB
- Level error: <0.5 dB
- Return loss: >18 dB

2.2. Connectors

- F-type 75 ohm, AC coupled

2.3. Indicators

- 16 LEDs indicating analyzer status
- 16 LEDs indicating LCD status
- 16 LEDs indicating switch position
- 2 LEDs indicating RF output activity
- 2 LEDs indicating power and network status

2.4. Physical Specifications

- Height 43.8 mm (1 unit)
- Width 482 mm (standard 19” dimensions)
- Depth 225 mm
- Weight 2.7 Kg

2.5. Electrical

- 48V DC Connector Reverse polarity protection
- Power consumption <25 Watt

2.6. Environmental

- Operating Temperature: 5°C ~ 45°C
- Storage Temperature: -20°C ~ 55°C
- Operating Humidity: 10% ~ 90%, non-condensing
- Fanless device

2.7. Network

- Fast Ethernet, control and management
• IEEE 802.3 10Base-T Ethernet
• IEEE 802.3u 100Base-Tx Ethernet
• Fixed IP address and DHCP support

- Giga Bit Ethernet, RTP streaming
• IEEE 802.3ab 1000BASE-TX

2.8. Management

- Remote
• Web
• SNMP
• SYSLOG
• USB
• TELNET
• FTP

- Local control
• Joystick

3. USER INTERFACE

3.1. CHANNEL SELECTION

All the tools that are available from the X16 web interface uses the same channel selection fields.

3.1.1. Channel selection toggle button:

Press the CH ‹› to toggle the display of the physical channel number

Physical channel number **off:**

The UP DOWN buttons and the PC keyboard ↑ ↓ keys walks through the channel list sorted by channel names alphabetically.

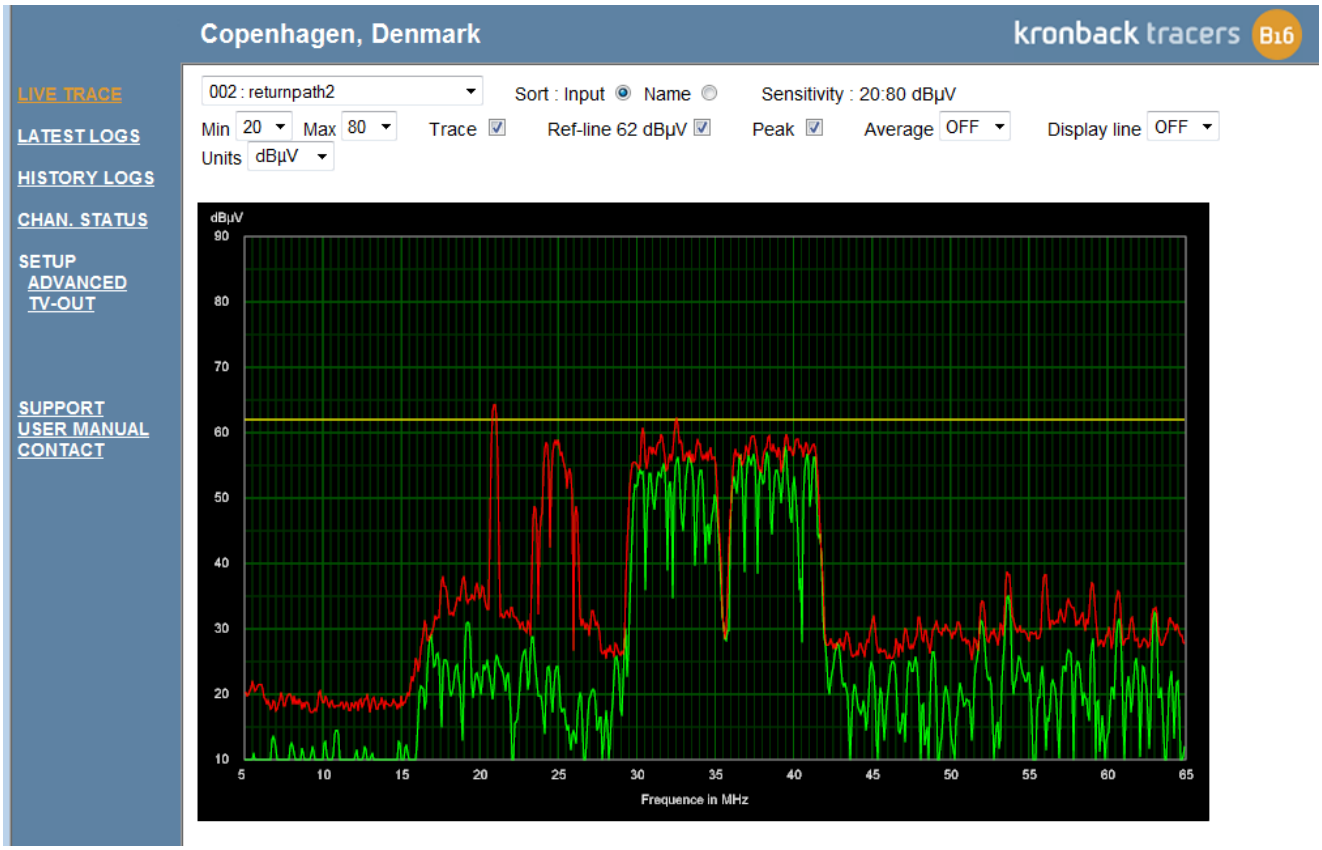
Physical channel number **on:**

The UP DOWN buttons and the PC keyboard ↑ ↓ keys walks through the channel list sorted by physical channel number

3.1.2. Text search

Make a text search in the selection box:

3.2. LIVE TRACE



All settings in the **LIVE TRACE** window are active only in the local browser and will not affect other users that are concurrently using the X16.

3.2.1. Channel selection field

The channel selection field selects which input that is presented in the **LIVE TRACE** window. Multiple users can monitor any input simultaneously.

3.2.2. Sort

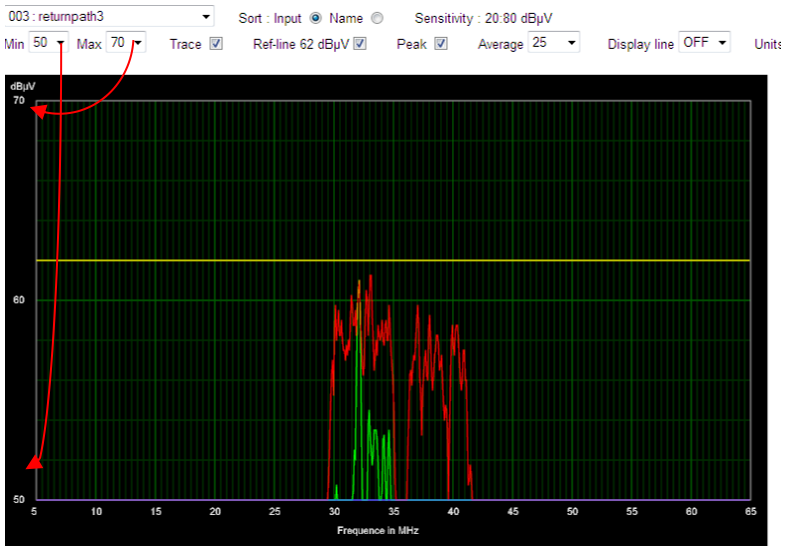
The channel selection field can be sorted by name or input number.

3.2.3. Sensitivity

The X16 has 4 attenuation ranges that can be assigned to each input channel.

Attenuation	X16 noisefloor is below	Max signal level(1CW)
0 dB	10 dBuV	70dBuV
10 dB	20 dBuV	80dBuV
20 dB	30 dBuV	90dBuV
30 dB	40 dBuV	100dBuV

3.2.4. Min / Max fields



A zoom function on the Y-axis is possible by selecting the **Min** and **Max** fields. The selection is in steps of 10 dB.

The zoom values are reset when a new channel is selected.

3.2.5. Trace

Selecting this field enables the green trace (**LIVE TRACE**) in the trace window.
The trace is updated approximately 2 times per second.

3.2.6. Ref line

Selecting this field enables the yellow line in the trace window. The reference level is configured individually for each channel in the **SETUP→INPUT** menu. The reference value should be set to the cable modems peak level and is used as reference for all carrier/noise (C/N) calculations within the X16.

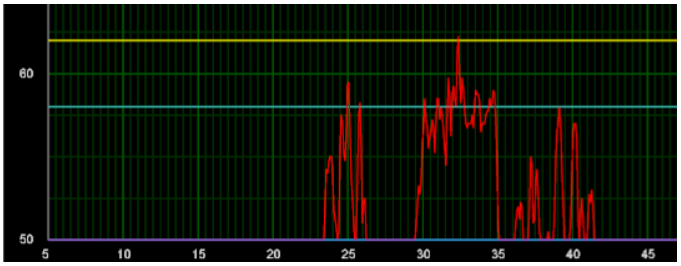
3.2.7. Peak

Selecting this field enables the red trace (peak hold) in the trace window.

3.2.8. Average

Selecting this field to anyting else than OFF, will enable a blue average trace.
The average line is based on a number of consecutive green traces. The maximum number of green traces averaged is 25.

3.2.9. Display line



A general purpose display line can be activated. The selection list either in dBuV or dBmv according to the **units** selection field.

3.2.10. Units

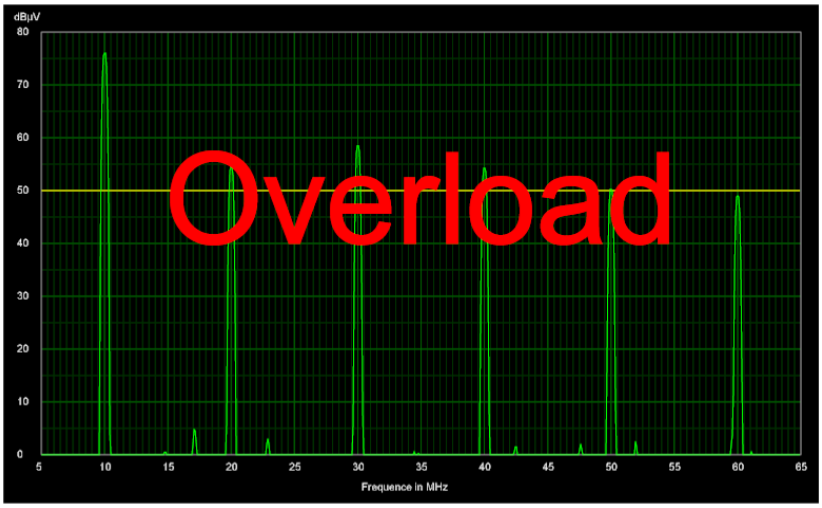
The X16 can display both dBmV and dBuV units. The setting is individual for each browser that connects to the X16, and the selection changes all absolute read-out in the X16 web user interface.

3.2.11. Cookie

All settings in the LIVE TRACE window are stored in a COOKIE to ensure that the window resumes in the same mode after closing the browser.

3.2.12. Overload

An Overload text is displayed in the **LIVE TRACE** window 1-2 dB before overload state is reached.



3.3. TIME LINE

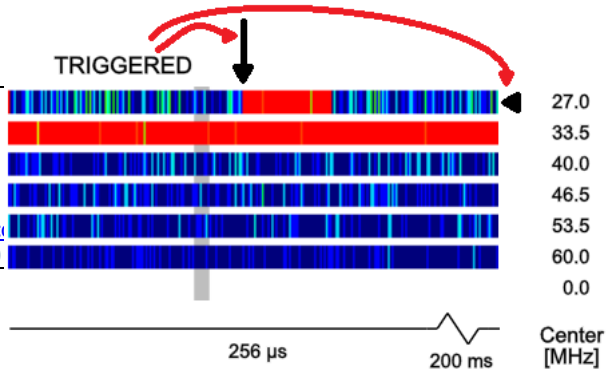
The Timeline function waits up to 3000 micro seconds for a cable modem to communicate.

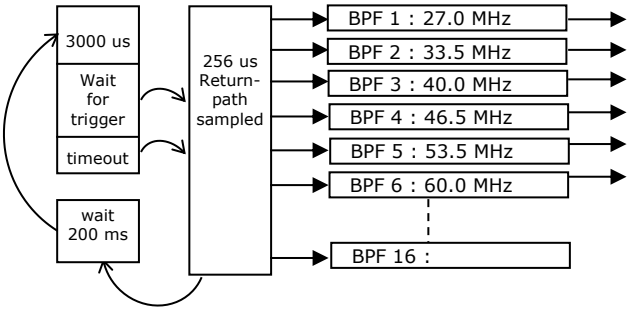
If a modem is detected, then the X16 samples 256 micro seconds of the full return path signal and then passes this data through up to 16 bandpass filters. The output of each bandpass filter is then presented on separate lines.

If no cable modems are detected within the 3000 microseconds timeout period then the trigger process is timing out and performs the sampling anyway, but without showing the "TRIGGERED" message.

After 200 milliseconds (1/5 of a second) the process is repeated. This results in 5 timeline measurements per second.

To preserve the graphical overview only 3 of the measurements are presented.





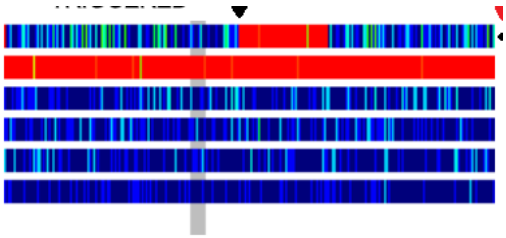
The timeline view is based on the raster definitions in the X16 SETUP→RASTERS menu

3.3.1. Timeline Controls

Pause: stops the timeline page from updating

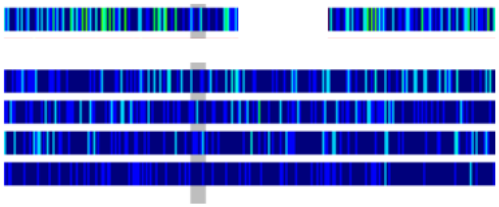
Sum: defines the number of timeline graphs that is used for the pulse counting. It can be set from 3 to 25

Grey bar:



3.3.2. Counting the pulses.

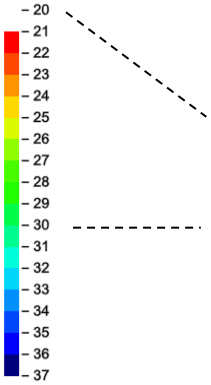
All the cablemodems data (the red parts) are removed from the picture above.



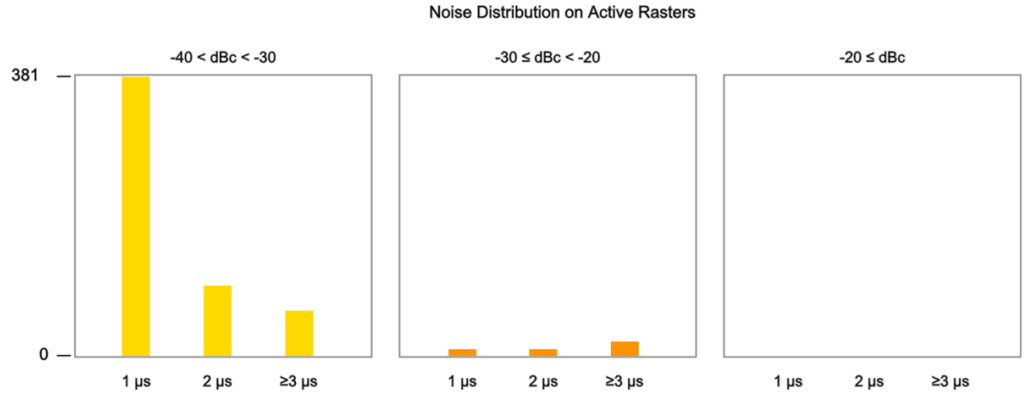
A simple counting of pulses is performed based on

- pulse width
- pulse strength

Note: Every pixel of the timeline graph corresponds to 1 microsecond (us)



Pulse strength Below reference line	Pulse width	count	example
< 20 dBc	1 us	0	
	2 us	0	
	3 us or more	0	
20-30 dBc	1 us	3	
	2 us	4	
	3 us or more	8	
> 30 dBc	1 us	381	
	2 us	82	
	3 us or more	62	



Count: 381 82 62 8 4 3 0 0 0

3.4. LATEST LOG

The **LATEST LOG** page displays the channels that are currently being logged. The channel number and names are presented. The timestamp shows the time of the latest logged file.

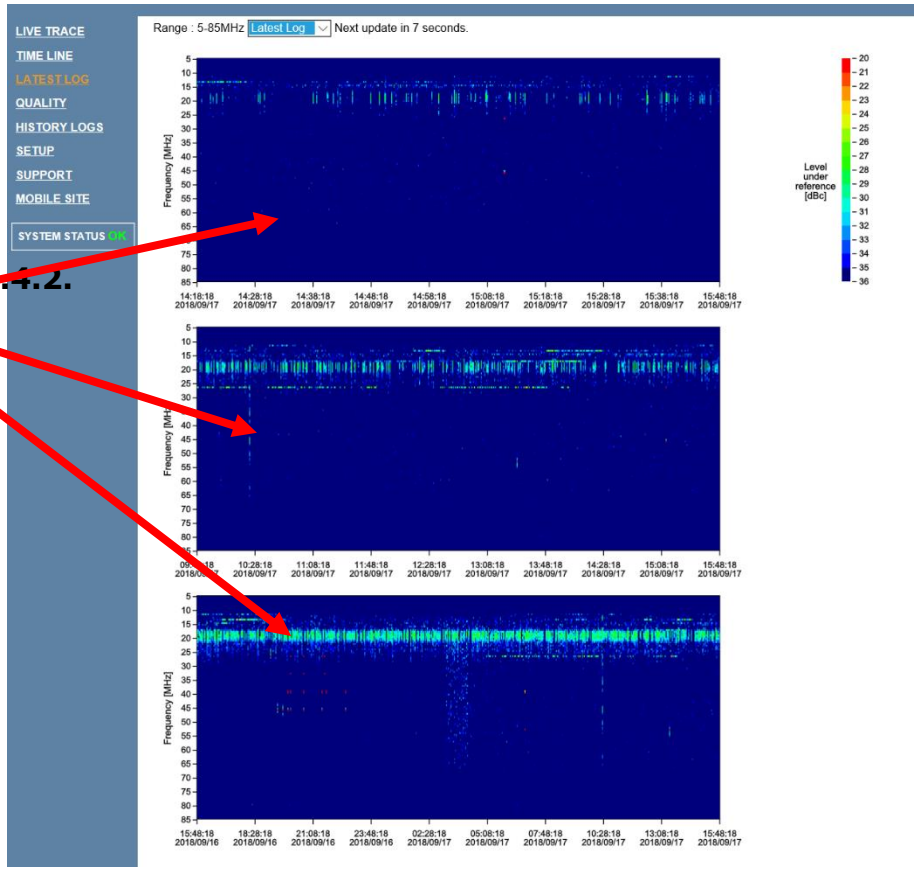
3.4.1. LATEST LOG graph

This graph is divided in 3 subgraphs. The top graph (1,5hours) is consolidated into the middle graph (6 hours) which is again consolidated in the button graph (24hours).

The 1,5 hours graph is based on 600 samples. Each dot on the x axis represents a sample. Since X16 stores a sample each 9th second the width is

600 samples x 9 sec/sample = 5400 sec = 90 min = 1,5h

Graph	Time
Top	1,5 hour
Middle	6 hours
Bottom	24 hours

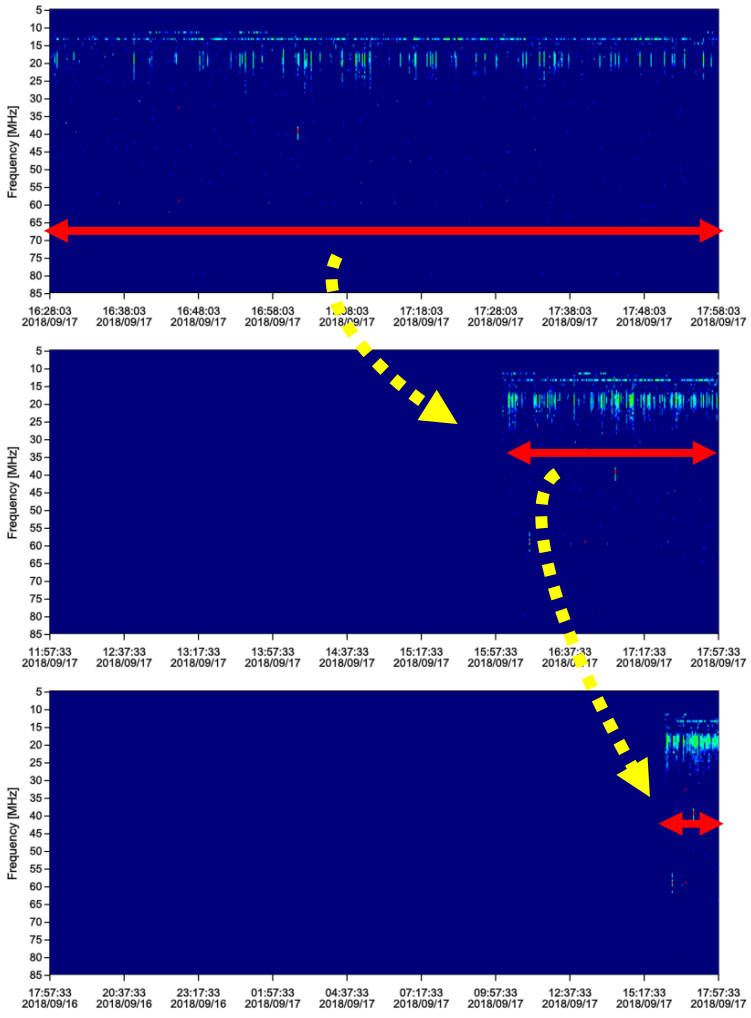


3.4.2.

3.4.3. Consolidation

Consolidating is done by merging a slice with a width of 6 dots into a slice of 1 dot.

The consolidation is performed by following a "worst case" approach, so that the most red of the 6 values is chosen in a "highest takes precedence" principal.
As a consequence the 24 hours graph will look worse (more red) than the 6 hours graph and the 6 hours graph will look worse (more red) than the 1,5 hours graph.
Each 24 hours the bottom graph (24 hours graph) is saved in the history storage. This storage is accessible in the main menu of **X16** under **HISTORY LOGS**

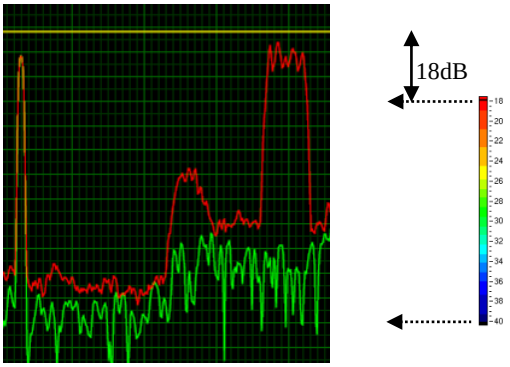


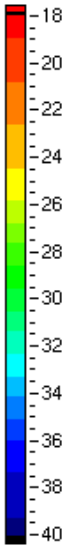
3.4.4. Color Coding

The log graphs are color-coded. The color represents the difference between the yellow line and the actual trace.

Differences less than 18 dB are pure red and differences over 40 dB are pure blue.

Example: Green color in the **LATEST LOG** graph represents a difference between the yellow line and the signal off approximately 30 dB.
So the green parts of the graph represent a C/N of 30 dB

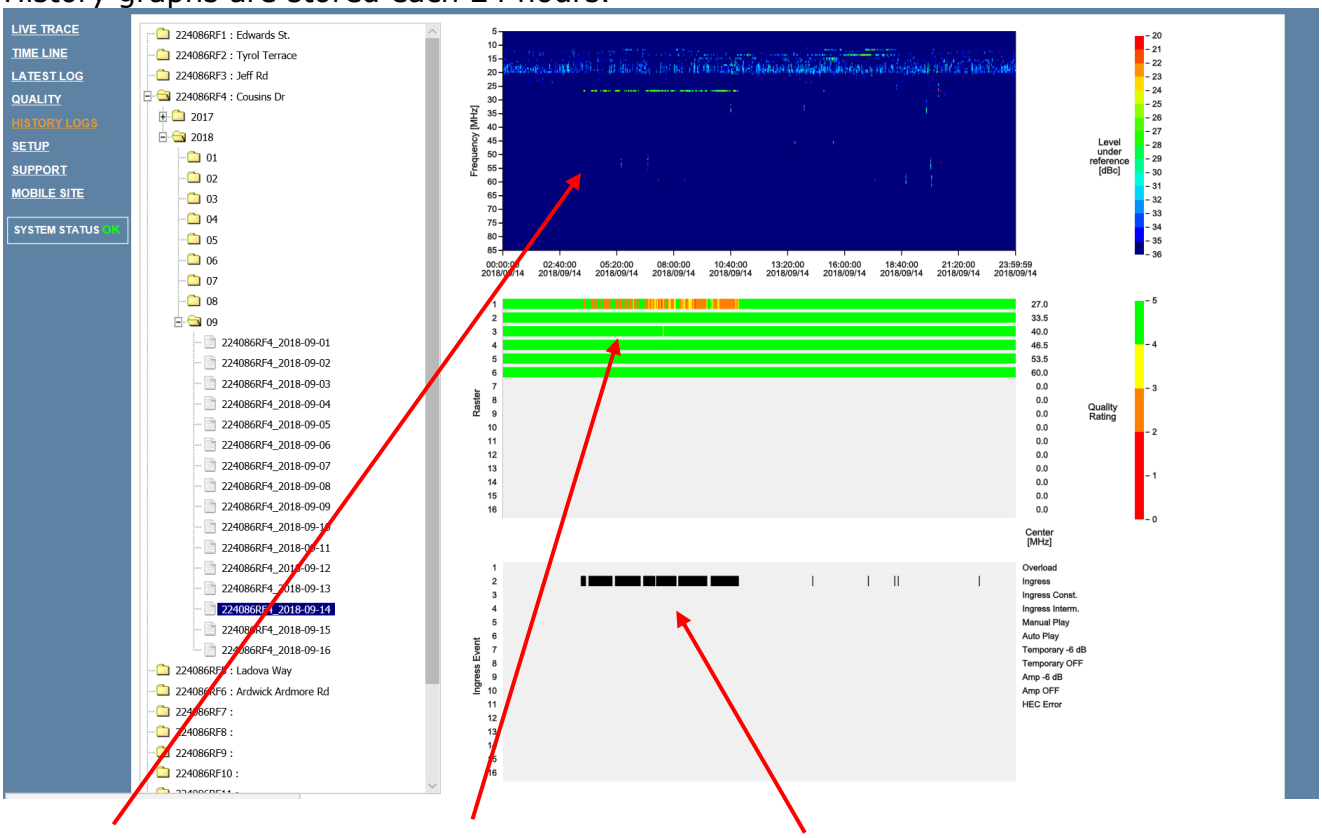




3.5. HISTORY LOG

3.5.1. 24 hours storage

History graphs are stored each 24 hours.



24 Hours graph Quality per raster FLAGS (Ingress detected)

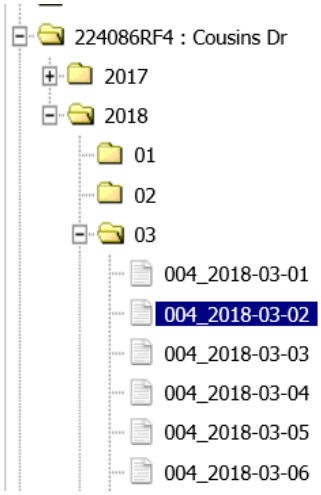
3.5.2. Color coding

The history graph uses same color coding as the **LATEST LOG** graph

3.5.3. Log storage

The history data are stored in a non-volatile memory of the X16.
History graphs are accessed by entering the tree structure in the **HISTORY LOG** menu.
This structure is organized in

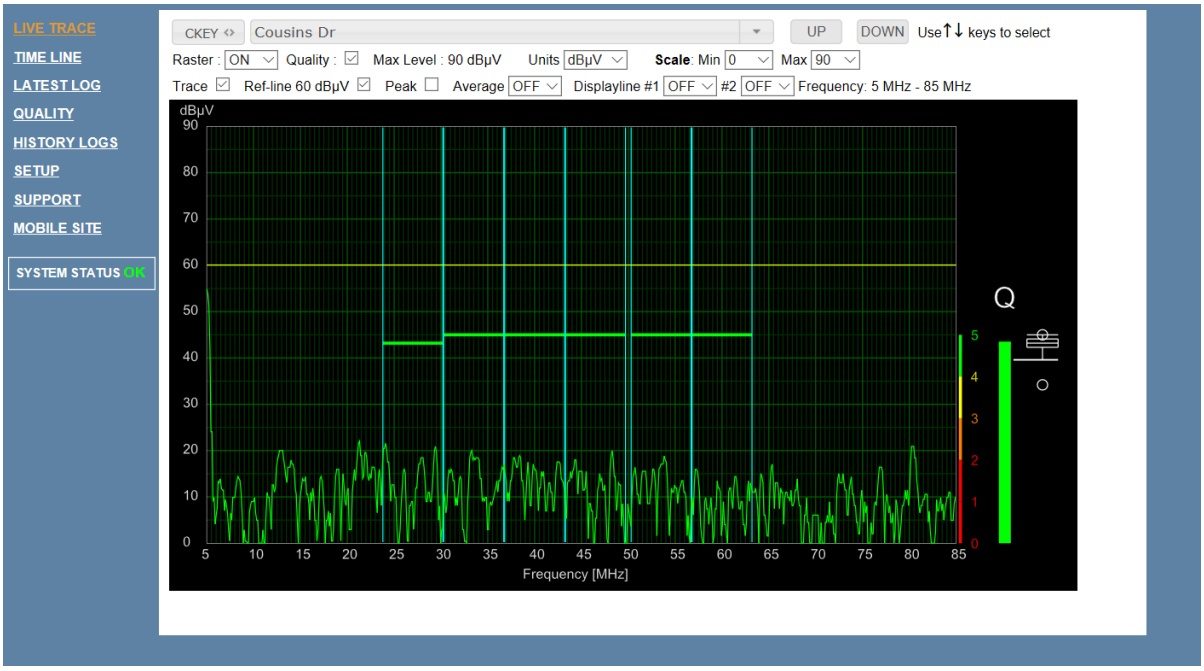
Channel → year→ month→ day



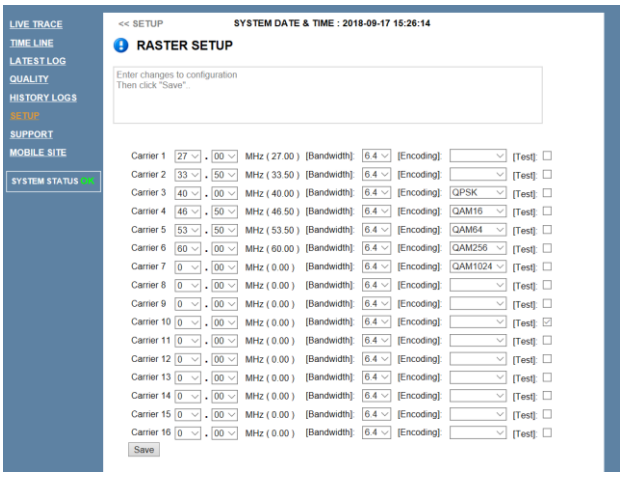
3.5.4. Log capacity

The internal storage capacity of X16 is 1 GByte. The X16 firmware occupies 250 Mbyte, 100 Mbyte are reserved for latest log storage, leaving 650 MByte for the history log. When this storage is filled the X16 will throw away the oldest data.

3.6. RASTER



Rasters are set in the **SETUP→RASTER** menu

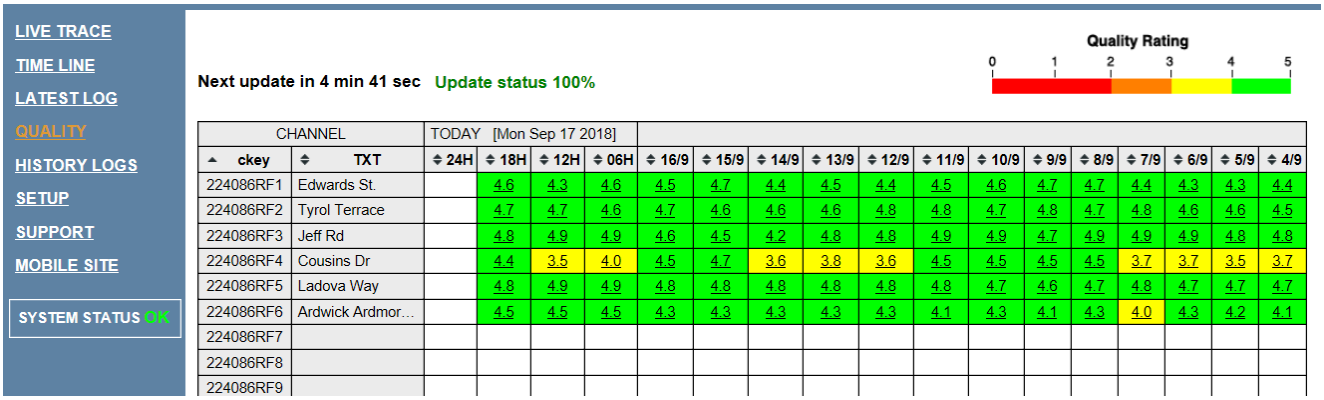


3.6.1. aster parameters

The spectrum in X16 can be divided into 16 rasters. The rasters are defined as a center frequency and a bandwidth. The center frequency can be selected with 2 decimals, and the bandwidth can be selected in steps of 800kHz, 1,6MHz, 3,2 MHZ and 6,4 MHz.

The rasters are used for calculation of the channel quality.

3.7. QUALITY

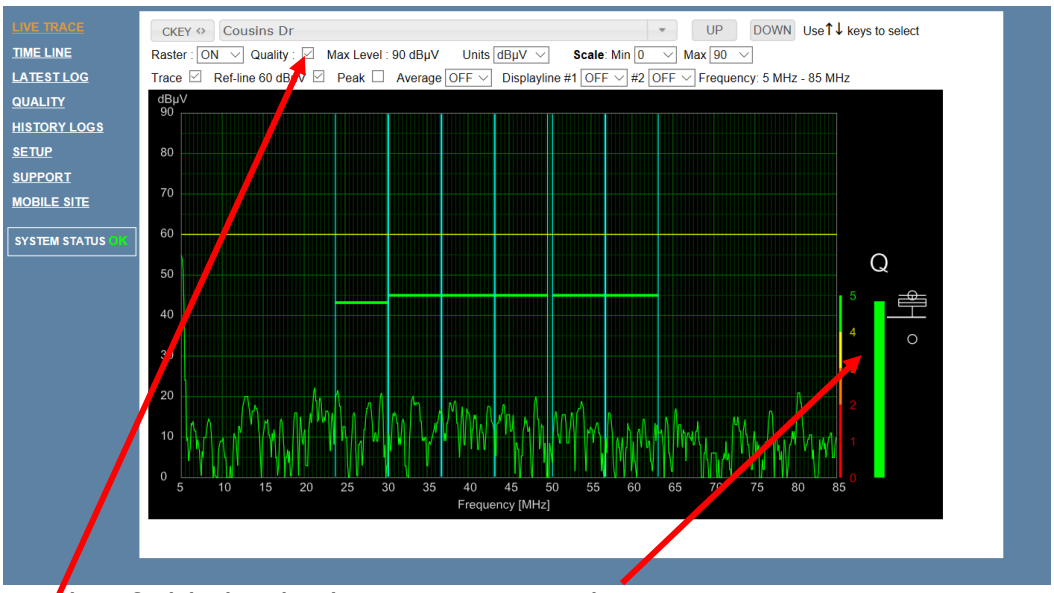


CHANNEL		TODAY [Mon Sep 17 2018]																
ckey	TXT	24H	18H	12H	06H	16/9	15/9	14/9	13/9	12/9	11/9	10/9	9/9	8/9	7/9	6/9	5/9	4/9
224086RF1	Edwards St.		4.6	4.3	4.6	4.5	4.7	4.4	4.5	4.4	4.5	4.6	4.7	4.7	4.4	4.3	4.3	4.4
224086RF2	Tyrol Terrace		4.7	4.7	4.6	4.7	4.6	4.6	4.6	4.8	4.8	4.7	4.8	4.7	4.8	4.6	4.6	4.5
224086RF3	Jeff Rd		4.8	4.9	4.9	4.6	4.5	4.2	4.8	4.8	4.9	4.9	4.7	4.9	4.9	4.9	4.8	4.8
224086RF4	Cousins Dr		4.4	3.5	4.0	4.5	4.7	3.6	3.8	3.6	4.5	4.5	4.5	4.5	3.7	3.7	3.5	3.7
224086RF5	Ladova Way		4.8	4.9	4.9	4.8	4.8	4.8	4.8	4.8	4.8	4.7	4.6	4.7	4.8	4.7	4.7	4.7
224086RF6	Ardwick Ardmor...		4.5	4.5	4.5	4.3	4.3	4.3	4.3	4.3	4.1	4.3	4.1	4.3	4.0	4.3	4.2	4.1
224086RF7																		
224086RF8																		
224086RF9																		

The X16 constantly evaluates the quality of each channel and presents the result in the Quality overview page. The overview has a depth of 14 days. The current day is divided in its four quarters, (night, before noon, afternoon and evening)

The quality rating is between 0 and 5 where 5 is the best quality.

The real-time Quality calculation can be observed in the livetrace graph, when the quality field is checked



Quality field checked

Quality BOX-PLOT view

3.7.1. Quality BOX PLOT view

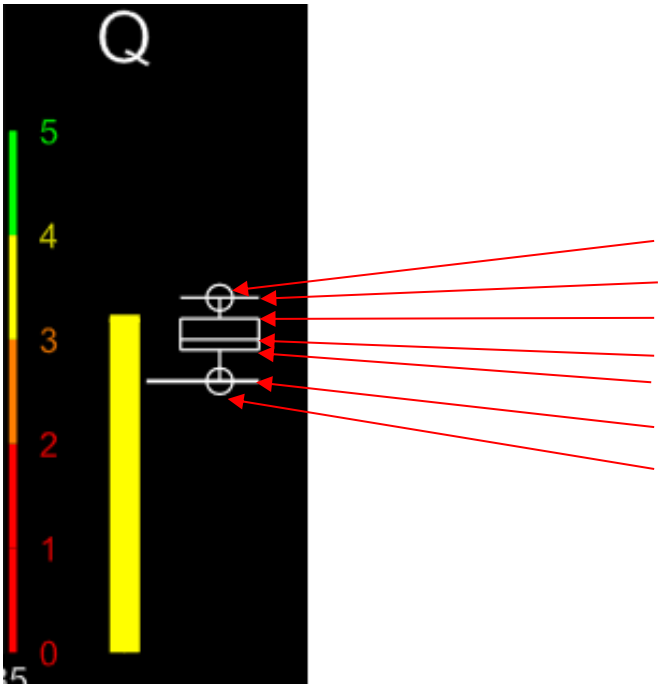
The BOX PLOT view is a running evaluation of the quality of each channel. The view is presenting the quality in a depth of 9 seconds.

Since the X16 is measuring the quality 5 times per second, a 9 second period equals 9*5=45 measurements. During this period the worst and best quality figure is presented (the top and bottom circle). The middle box is showing the quartiles and median.

The lines between the box and the circle represents the 5 and 95 percentile.

One interesting feature of the BOX PLOT is that 50% of all data is always contained inside the box

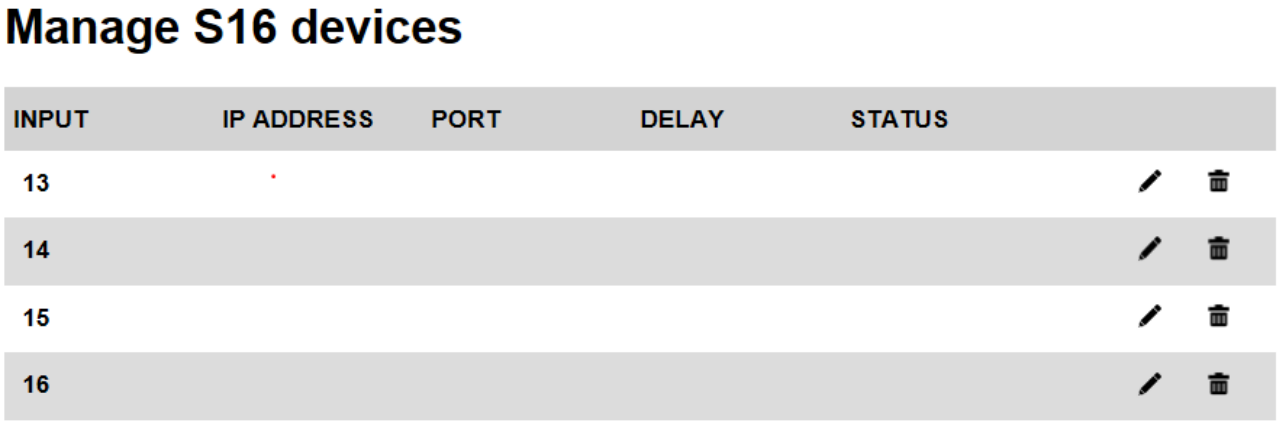
For more info about how a BOX PLOT is presents its data, see https://en.wikipedia.org/wiki/Box_plot



During the last 9 seconds
MAX
95 percentile
High quartile
Median
Low quartile
5 percentile
MIN

4. Setup

4.1. S16 Setup



The **SETUP→S16 Setup** menu is used to define the topology when multiple external **S16** switches are connected to **X16** for input expansion.

4.1.1. Switch topology

Up to 4 external switches can be entered, providing a 76 input **X16** system. If no external switches are used, the setting **X16** nothing should be entered in this setup menu.
The number of inputs that is set via the S16 setup configuration menu is globally changing all pages and menus in the **X16** related to inputs.

4.1.2. Input steps

Each additional input switch provides 16 inputs, but occupies 1 input for the cascade connection to **X16**, so the input increments are in steps of 15.

Number of switches	Number of inputs
X16 only	16
1	31
2	46
3	61
4	76

4.1.3. IP address

IP address of the connected switches. These must be formatted as IP-addresses (e.g. 192.168.100.81) DNS names are not allowed.

4.1.4. Port

The port number used for the IP socket connection to the external switches. It is factory preset to 1000 in the S16 switches but can be changed from the console interface of the S16.

4.1.5. Delay

The timeout parameter decides how long time [ms] the X16 switch routine will try to re-connect to the S16 in case of missing network connectivity. For most networks 60 ms are recommended.

4.1.6. Insertion loss compensation

An internal routine in the **X16** ensures that the measurements on the cascaded input 1 to 48 are compensated for the extra insertion loss caused by the **S16**.

4.1.7. State check

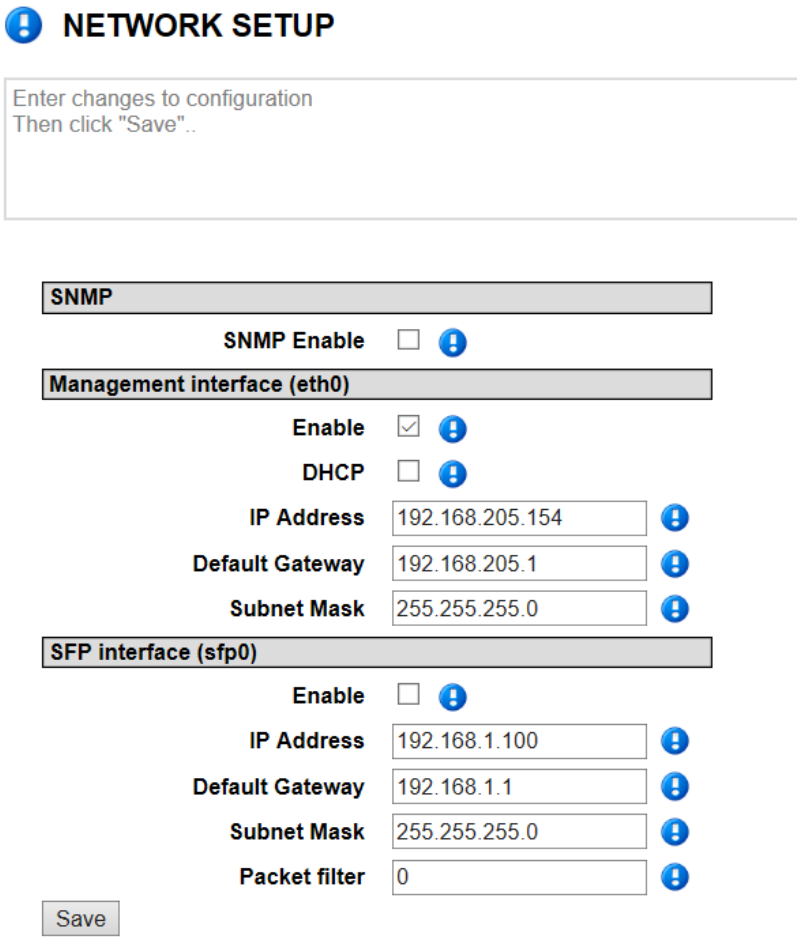
The state of each **S16** and **X16** setting can be verified by viewing the LED´s over each f-connector.

To verify correct configuration, simply run through all inputs from the livetrace menu. Check that the correct LED´s on the **X16** and **S16** fronts are lighting.

For further assurance, a signal generator could be connected to each input for verification of correct signal paths and levels.

4.2. Network Setup

4.2.1. Dynamic or static IP address.



4.2.2. SNMP Enable

The X16 will respond to SNMP GET commands. The MIB file is available from the www.kronback.com website.
SNMP SET and SNMP Trap are not supported.
The SNMP community string is fixed set to **PUBLIC**

4.2.3. Enable (eth0)

The management network interface can be disabled for debug purposes. To re-enable the management interface use the LCD panel of the X16

4.2.4. DHCP (eth0)

The management interface of X16 can work in static mode or in DCHP.
The dynamic address assigned by a DHCP server can be verified on the LCD display on the front of the X16 unit.

4.2.5. IP address, Default gateway and Subnet Mask (eth0)

These are the IP address setting of the management interface.
This address must not fall within the dame subnet range as the SFP network

4.2.6. Enable (sfp0)

The management network interface can be disabled for debug purposes. To re-enable the management interface use the LCD panel of the X16

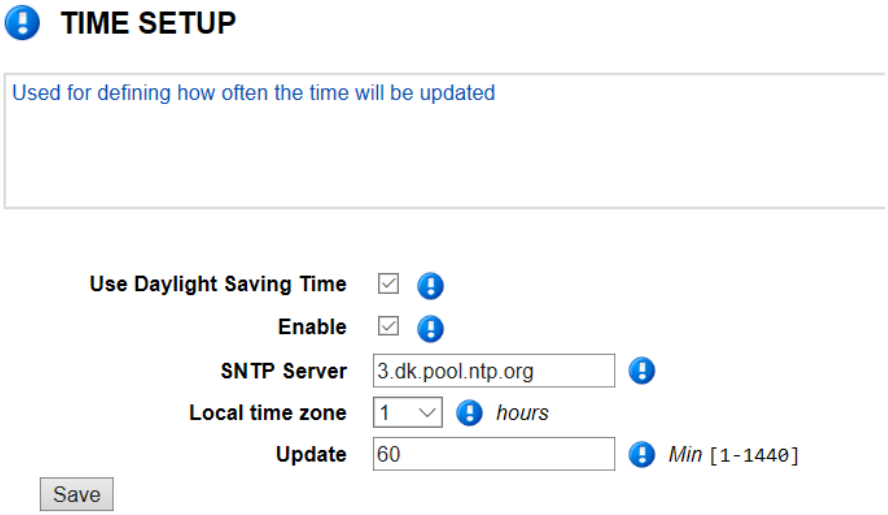
4.2.7. IP address, Default gateway and Subnet Mask (sfp)

These are the IP address setting of the management
The address must not be in the management interface subnet range

4.2.8. Packet filter

Enter 0 for default packet filtering setup. Don't enter other values value unless instructed by support.
The value 0 means that all incoming multicast packages will be discarded.

4.3. Date & Time



4.3.1. Use Daylight Saving Time

Used for enabling the use of Daylight Saving, when updating time

4.3.2. Enable

Used for defining if SNTP time update is enabled

4.3.3. SNTP Server

Used for defining the IP address of domain of the SNTP-server

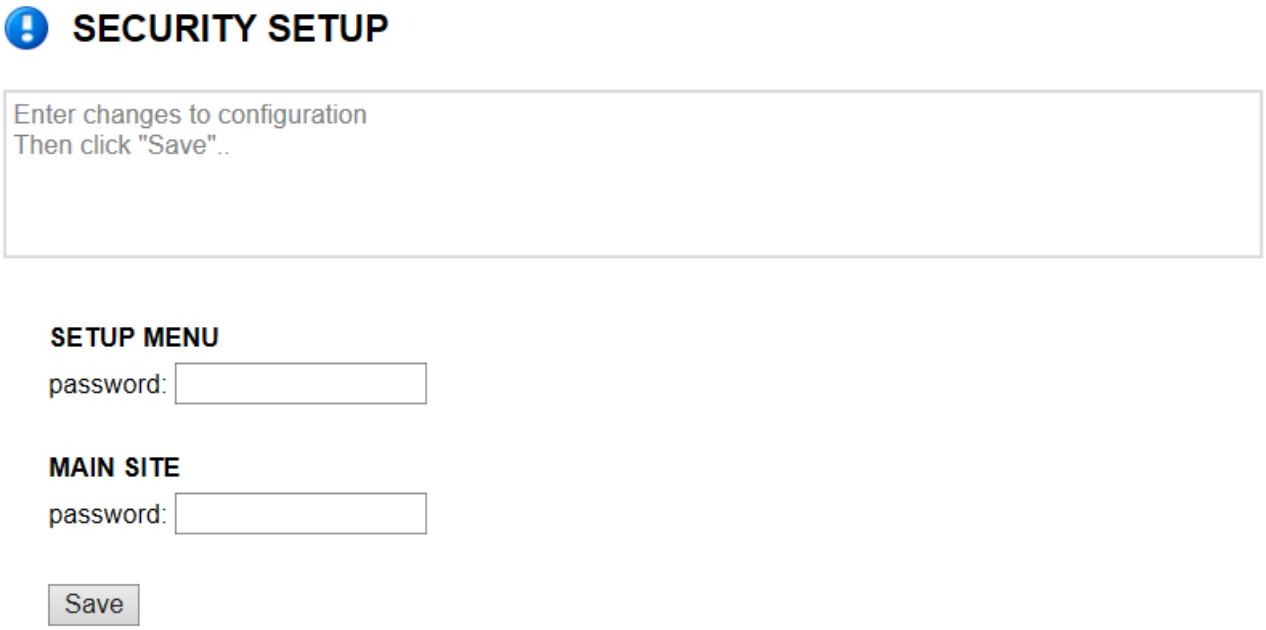
4.3.4. Local Time zone

Enter local time zone in hours, for example: 2 for GMT+2

4.3.5. Update

This value is defined as minutes between SNTP updates.

4.4. Security setup



From the security page user credentials and License Key can be entered.

4.4.1. SETUP MENU

The X16 has only a single user profile. This profile is used to ensure that only approved users can enter the **SETUP** menu. The username and password is sent unencrypted over the IP network.

4.4.2. MAIN SITE

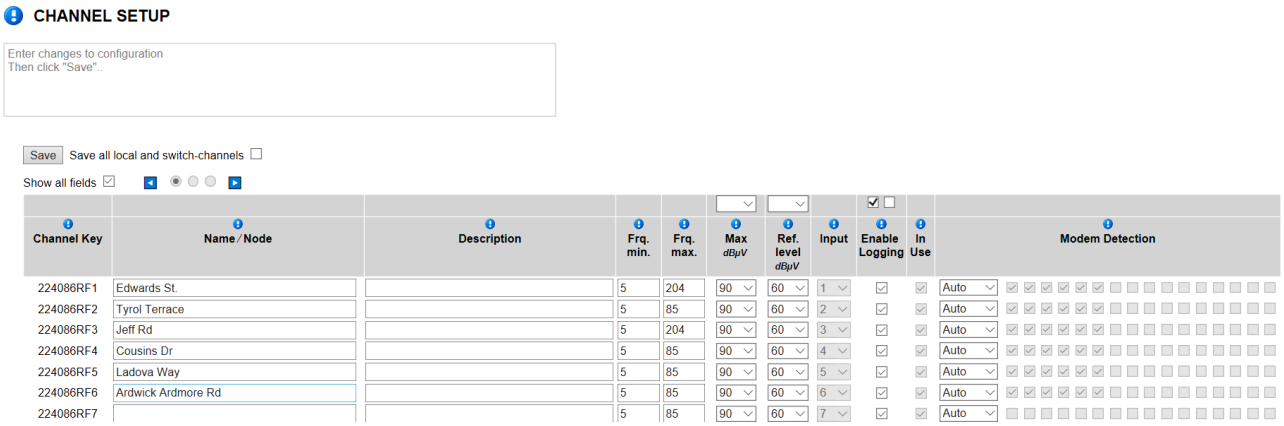
The main site password prompts all users who wants to access the X16 user interface. Enter this password. The SETUP password from the setting above will work as well for as a global password for the X16 website.

4.4.3. LOST Password

Both the SETUP and MAIN passwords can be verified in the X16 front LED display under CONFIG→SHOW WEB PASSWORDS

4.5. Channel

Please refer to the chapter ”**Raster and channel status”**nput setup



Channel Key	Name / Node	Description	Frq. min.	Frq. max.	Max dBµV	Ref. level dBµV	Input	Enable Logging	In Use	Modem Detection
224086RF1	Edwards St.		5	204	90	60	1	☑	☑	Auto
224086RF2	Tyrol Terrace		5	85	90	60	2	☑	☑	Auto
224086RF3	Jeff Rd		5	204	90	60	3	☑	☑	Auto
224086RF4	Cousins Dr		5	85	90	60	4	☑	☑	Auto
224086RF5	Ladova Way		5	85	90	60	5	☑	☑	Auto
224086RF6	Ardwick Ardmore Rd		5	85	90	60	6	☑	☑	Auto
224086RF7			5	85	90	60	7	☑	☑	Auto

4.5.1. Channel Key

Global Channel number when the X16 is in master/slave mode. When multiple X16 are grouped together in a master/slave setup, each input has a global channel number.
The Global channel number is used to identify each channel.

4.5.2. Name / Node

The name of each input is entered in the Name/Node field to describe the node number.
In some cases, this name will also be used as a database reference for such as external GIS system.
The name will be used throughout the X16 GUI to identify the input. This field should always be filled out

4.5.3. Description

The description field can be used for supplementary information to the name/node field.
The field is not used as look up reference for external systems and could be left blank.

4.5.4. Frq. Min

Low frequency setting of the upstream frequency range.

4.5.5. Frq. Max

High frequency of the upstream frequency range

4.5.6. Max dBuV

The Max dBuV level defines the maximum level that can be present on the channel before overload appears.
The value is equivalent to 1 CW present on the channels input.
Typical modem reference level should be 20dB under this maximum level to avoid overload if multiple modems are simultaneously communicating.

4.5.7. Ref. level dBuV

The Ref Level defines the modem level of the DOCSIS modem bursts. It is used globally in the X16 to define the C/N level of each channel and raster. The Ref. Level is visualized in the livetrace view's yellow line.

4.5.8. Input

This number displays the physical input of each X16 and will always be between 1 and 16.

4.5.9. Enable Logging

To activate the cyclic logging of each channel, enabled it with a checkmark

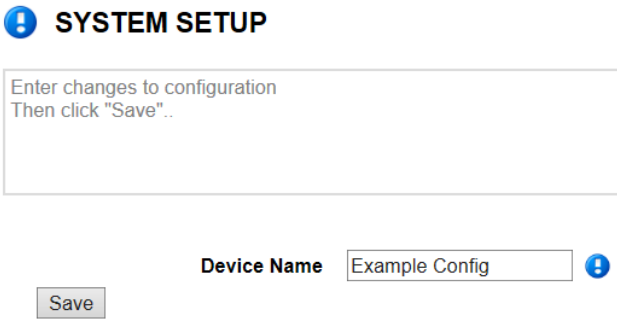
4.5.10. In use

This field displays the status of each channel.
It must always be on to display that the channel is active and in use.

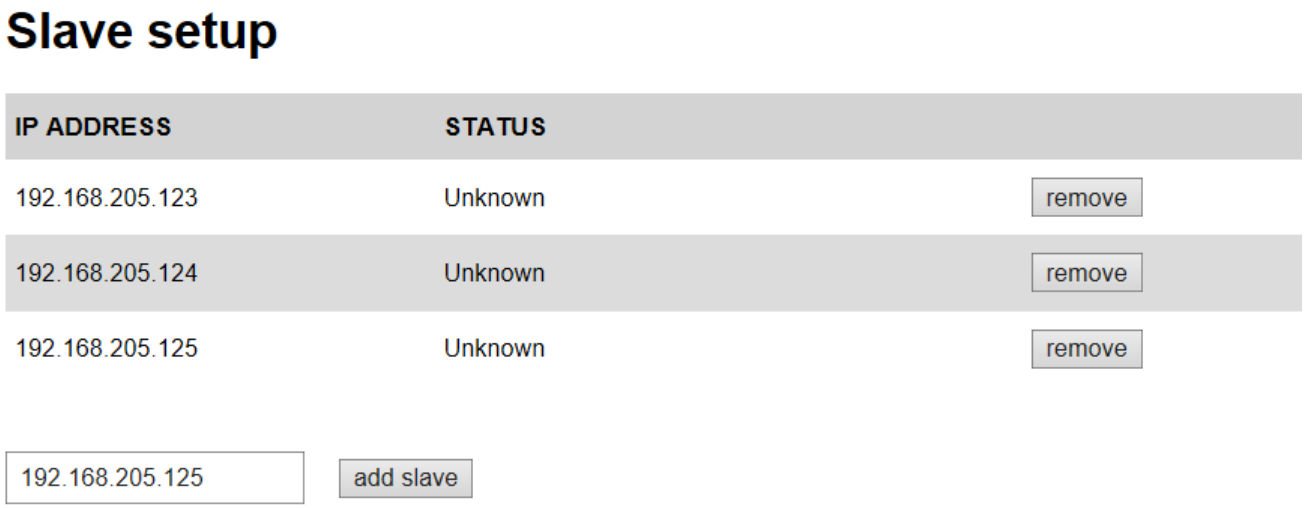
4.5.11. Modem Detection

In Auto mode this each of the 16 check boxes will show on which rasters the X16 has identified DOCSIS modem traffic.
In Manual mode this autodetection can be forced to on or off by the operator.
Only active rasters will be used for quality detection and presentation in the raster-based GUI views throughout the X16.
Refer to the SETUP→RASTERS men to see the 16 raster definitions.

4.6. System

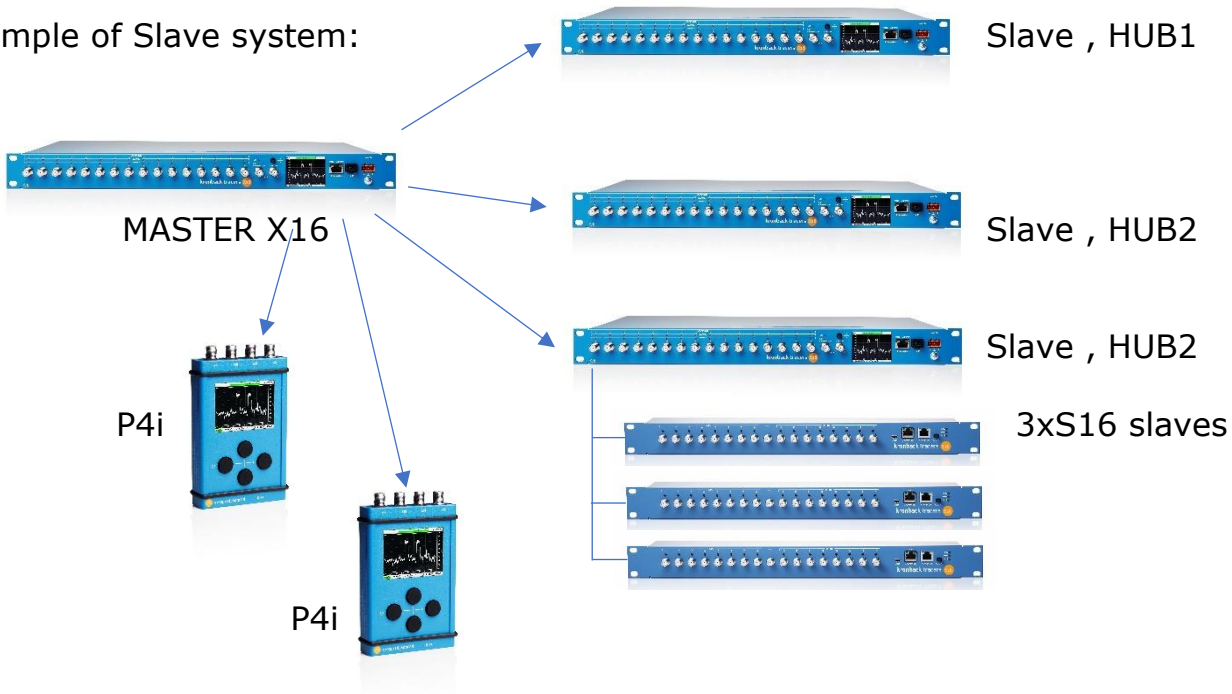

SYSTEM SETUP
Enter changes to configuration
Then click "Save"..
Device Name
Example Config
Save

4.7. Slaves



An unlimited number of X16 and P4i units can be added to the slave table.
The slaves can then be accessed from tbe MASTER X16 web intercace.
Slaves can be added and removed on the fly.

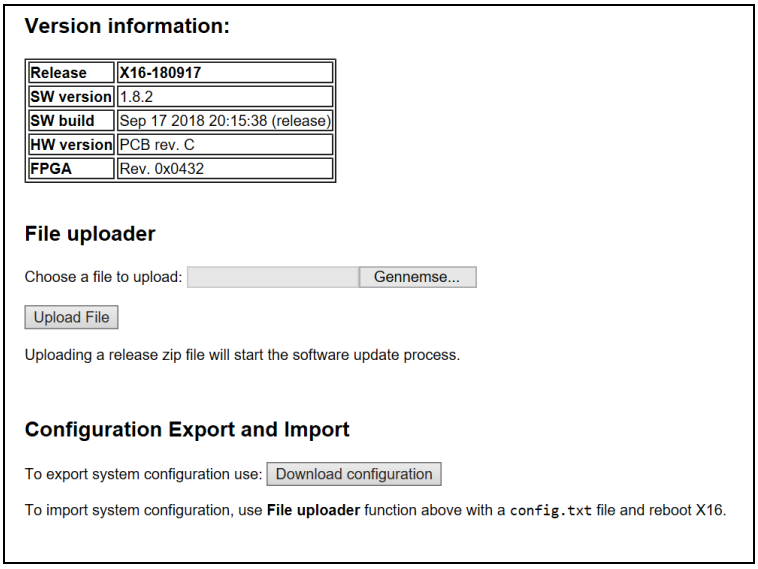
Example of Slave system:



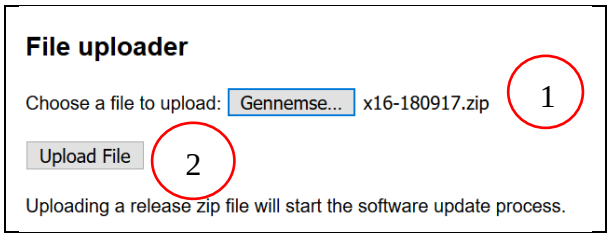
4.8. SYSLOG

X16 can report alarms and warnings in the SYSLOG format.
Up to 2 SYSLOG destinations can be defined. These 2 addresses can be both in the IP format or as a DNS name.
To disable syslog messages, leave the fields blank.

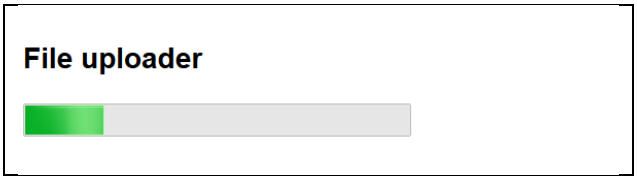
4.9. Software Update



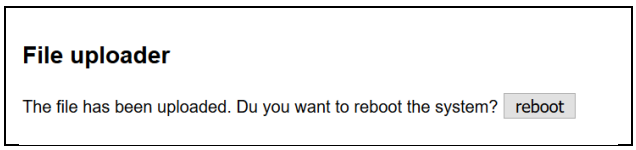
The file uploader section of the software update page can be used to place any file in the X16 root directory. For software upgrades the zip file contains a full upgrade package and will upgrade all files inside the X16.
After choosing the upgrade file select upload file.



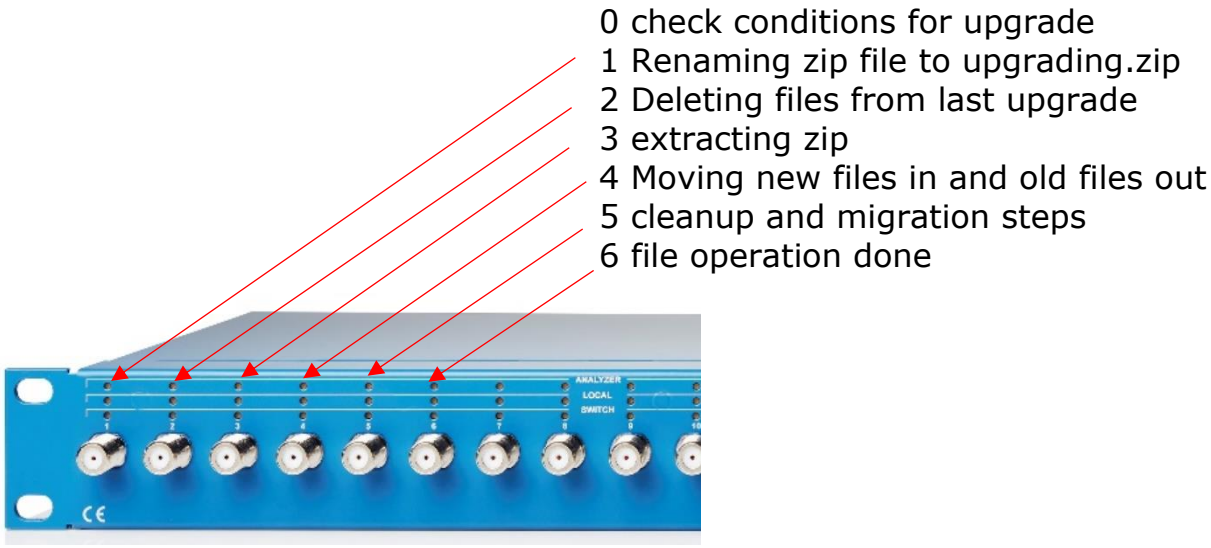
This will upload the zip file in to the root directory of the X16. The progress of the upload can be observerd by the green progress bar.



To activate the upgrade it is necessary to reboot the X16.



After reebooting the X16 there will be approximately 2 minutes without access to the unit, but during the upgrade process its status can be verified on the front LED´s of the Input 1-6 F connectors.



Note: For the upgrade procedure to work the X16 must **not** be placed behind a firewall using NAT, Network Address Translation.