IQDBT105
DVB-T2 and DVB-T Monitoring receiver

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Hawkeye IQDBT105 DVB-T2 and DVB-T monitoring receiver

The IQDBT105 Hawkeye module monitors input RF modulation parameters and signal performance metrics including Modulation Error Ratio (MER) and Low Density Parity Check (LDPC). It is fully integrated into the Snell IQ Modular range enabling use with existing IQ Modular infrastructure, other products from the IQ Modular range and the RollCall Control and Monitoring system.

Off-air monitoring and acquisition
Hawkeye IQDBT105 can be used as an off-air monitoring device to receive, demodulate and monitor key RF Quality of Service (QoS) metrics on the RF signal with essential Transport Stream checks. DVB-ASI output is available for additional transport stream diagnostics and decoding.

Transmitter site monitoring
At transmitter sites the signal at the RF monitor port can be monitored for correct configuration of DVB-T2 signal parameters and as a check on signal quality. Essential transport stream content checks can be made within the module.
A DVB-ASI output is available for additional transport stream diagnostics or for video/audio decoding.

DVB-T2 and DVB-T support
Hawkeye IQDBT105 is able to receive, demodulate and monitor RF signal quality for both DVB-T2 and DVB-T broadcast signals. DVB-T2 single PLP (mode A) and multi PLP (mode B) modes are supported in accordance with the DVB-T2 standards.

Hawkeye IQDBT105 can be deployed in DVB-T networks, providing a future proof solution for those considering the possibility of DVB-T2 networks in the future.

Templates
The structure of a DVB-T2 signal is complex and requires detailed monitoring to ensure that the correct format is transmitted. Templates are a powerful tool to simplify the verification of such complex signals.

Hawkeye IQDBT105 allows a template to be generated, which is used to compare the received DVB-T2 signal against the expected modulation parameters.

Each parameter of the template can be programmed to verify that the DVB-T2 signal is broadcast as expected by the transmitter operator.

Error correction monitoring
Monitoring Mean Low Density Parity Check codes (LDPC) is useful to determine how hard the error corrector is working.

Hawkeye IQDBT105 provides the capability to monitor LDPC performance enabling operators to determine when a broadcast signal is close to becoming un-correctable.

Signal quality monitoring
The higher modulation indexes used in DVB-T2 can result in loss of signal margin, compensated by improved error detection and correction.

Monitoring the Modulation Error Ratio (MER) provides an early indication of any degradation in quality of service enabling operators to be proactive in resolving network issues.

Adjacent channel performance
A transmitter site is typically a difficult RF environment. Low power reception signals are received in the presence of high power transmissions on the transmitter side. A key requirement for transmitter site monitoring is the ability to operate successfully in the presence of higher power adjacent channels (better than +10dB). A highly specified receiver is of little use if the adjacent channel performance is marginal.

Hawkeye IQDBT105 comfortably exceeds adjacent channel performance requirements for use at transmitter sites.

Transport Stream Monitoring
The most common source of payload/content problems is incorrect Mux configuration. Transport Stream Monitoring is available to monitor PAT conformance and PID presence against a user defined list of expected PIDs.

Alarms and event log
Hawkeye IQDBT105 can provide the following alarms in the event that a signal condition is out of specification and a log is provided which records all alarms and timestamp information.

- If the received DVB-T2 signal parameters are different to the current template, an alarm can be generated.
- RF input level is monitored against upper and lower limits.
- MER is measured on a continuous basis and an alarm is generated if it falls below a programmable level.
- Alarm limits can be set for LDPC and an alarm generated if error correction exceeds the threshold set by the user.
- Alarms can be set for frequency error to ensure that the transmitter is on frequency.
- Upper and lower TS bit rate alarms can be set.
- Pre LDPC and Pre BCH BER alarms can also be set.
- An alarm can be triggered if the basic transport stream content and structure is not as expected.

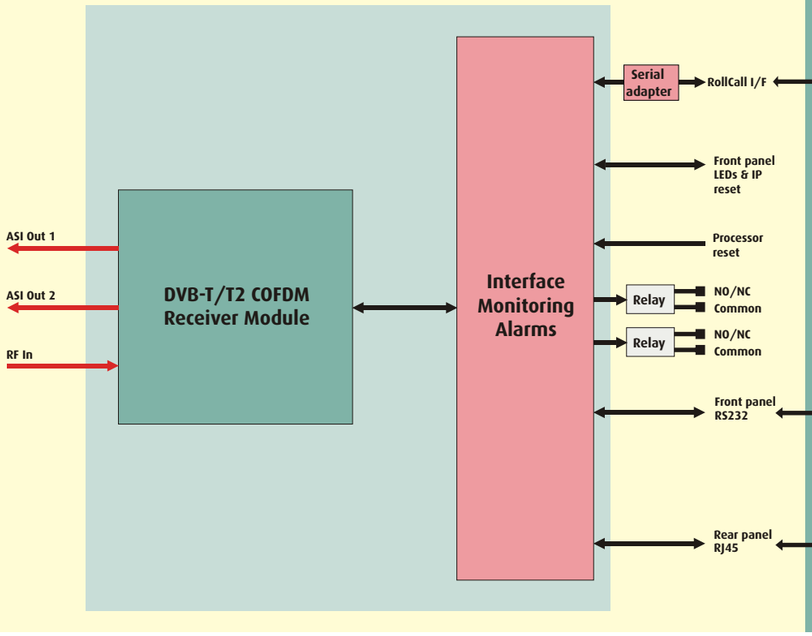
A pair of closing contacts is available for monitoring of alarms and a reset in pin is included as not all remote sites have Ethernet access. Alarms are configured by either the web page or by SNMP.

Design for high reliability
All measurements, tests and logs are performed and maintained in the IQDBT105 module itself so it will continue to function in the event of control network problems.

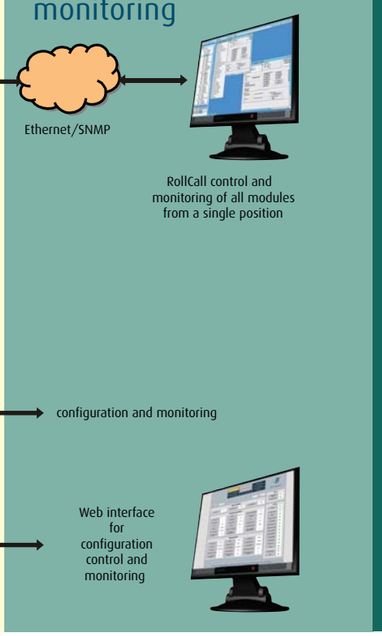
RollCall control
Multiple modules can be controlled and monitored from a single Ethernet port using the RollCall control and monitoring software from Snell.
The RollCall system provides basic control and monitoring for the IQDBT105 with the additional capability of monitoring third party equipment via SNMP, serial or GPI interfaces.

Web page interface
The web page is contained within the IQDBT105 module, enabling a suitable device full monitoring and control of the unit. All pages may be viewed and configuration pages are password protected before changes can be made.

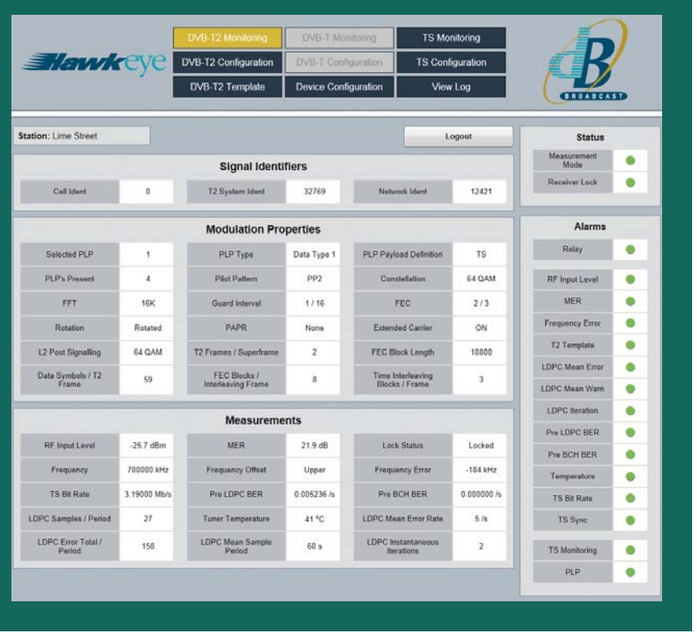
The IQDBT105 DVB-T2 and DVB-T monitoring receiver module



External control and monitoring



Hawkeye IQDBT105 web user interface



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The Hawkeye IQDBT105 module has been designed for continuous off air demodulation and monitoring of DVB-T2 and DVB-T signals. It supports the latest DVB-T2 standard and eight modules can be fitted in a 3RU rack space or two in the 1RU frame.

Technical specifications:

RF input

Input connector:	F type
Return loss:	6dB typical
Tuning range:	178MHz to 858MHz
Input level:	-20dBm to -80dBm
Tuning step:	125kHz 7MHz channel, 166.7kHz 8MHz channel

ASI output

Output connectors:	2 off BNC type, 75Ω typical, DVB-ASI compliant
ASI format:	Byte mode

Physical

Dimensions:	2 slots of a 3RU or 1RU frame
IQH1A Frame:	1RU, 4 slots, single or dual PSU
IQH3B Frame:	3RU, 16 slots, single or dual PSU

Environment

Operating temperature:	0 - 40ºC

Graphical User Interface

PC requirements:	Microsoft Internet Explorer 9

	DVB-T2	DVB-T
DVB standard	Single PLP (mode A) and multi PLP (mode B) as defined within EN 302 755	DVB-T in accordance with specification EN 300 744
Modulation		
Guard interval:	1/4, 19/128, 1/8, 1/32, 1/128, 19/256, 1/16	1/4, 1/8, 1/16, 1/32
Code rate:	1/2, 2/3, 3/4, 5/6, 7/8, 3/5, 4/5	1/2, 2/3, 3/4, 5/6, 7/8
Modulation:	QPSK, 16QAM, 64QAM, 256QAM	QPSK, 16QAM, 64QAM
FFT:	1k, 2k, 4k, 8k, 16k, 32k	2k, 8k
Modulation status		
[T] denotes parameter tested with template	Selected PLP [T], Pilot pattern [T], Constellation [T], FFT [T], Guard interval [T], FEC [T], Rotation [T], PAPR [T], Extended carrier [T], L1 post signalling [T], No of T2 frames/superframe [T], Time interleaving blocks/frame [T], No of data symbols/ T2 frame [T], FEC blocks/interleaving frame [T], FEC block length [T]	Constellation COFDM mode Guard interval HP FEC LP FEC
Modulation ident	Cell ident, T2 system ident, network ident	
Measurements and alarms		
Measured parameters:	Input level (dBm) MER (dB) Lock status Frequency (kHz) Offset Frequency error (kHz) TS bit rate Pre LDPC BER Pre BCH BER LDPC error ratio, LDPC instantaneous iterations LDPC error total/period, samples/period, mean error rate Tuner temperature (°C)	Input level (dBm) MER (dB) Lock status Frequency (kHz) Offset Frequency error (kHz) TS bit rate BER pre viterbi BER post viterbi UCE UCE total Tuner temperature (°C)
Alarm parameters:	TS sync loss PAT repetition PID presence against user defined list (up to 6 PIDs checked) Tuned Alarm relay (summary) RF input level (upper and lower) MER (lower) Frequency error (upper and lower) T2 template error LDPC mean error (upper) LDPC warning (upper) LDPC interation (upper) Pre LDPC BER (lower), Pre BCH BER (lower) TS bit rate (upper and lower) Receiver lock Tuner temperature (upper and lower)	TS sync loss PAT repetition PID presence against user defined list (up to 6 PIDs checked) Tuned Alarm relay (summary) RF input level MER (lower) Frequency error (upper and lower) TS bit rate (upper and lower) BER pre viterbi BER post viterbi Receiver lock Tuner temperature (upper and lower)

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