



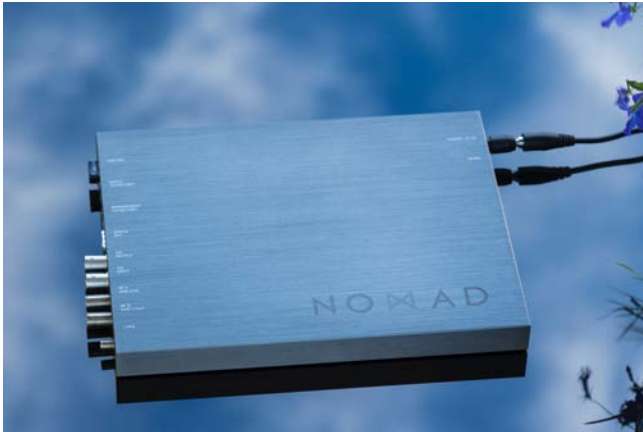
# Technical Specifications

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Version: 1

## ABOUT NOMAD



**NOMAD covers all the monitoring needs encountered in hybrid IP multicast, OTT and RF networks. It is the ultimate all-in-one monitoring and analysis solution for the technician on the move.**

NOMAD is a breakthrough design with almost every conceivable interface for media signal monitoring and analysis. Featuring optical/electrical Gigabit Ethernet, ASI in/out, DVB-C QAM cable, DVB-T/T2 COFDM terrestrial, DVB-S/S2 satellite and external 1PPS GPS time-reference, NOMAD can analyse all RF transmitted DVB signals as well as OTT and multicast/unicast IP transmissions.

With comprehensive IP packet analysis tools, NOMAD is ideal for IP transport understanding regardless of media transported. NOMAD also is shipped with the ultimate in user friendly setup. The unit contains a Wi-Fi zone, and by pointing a laptop towards this, NOMAD is ready for use without further configuration.

As technologies become more and more complex, using Nomad will give invaluable insight into modern media signal behaviours without the need for deep operator knowledge of the media technology used. Cut from a single brick of aluminium, NOMAD sets a new standard for both finish and ruggedness. It is also of very light weight and is the perfect companion to a laptop.

NOMAD ships with extensive functionality for superior digital media understanding right out of the box. Additionally NOMAD has a substantial additional set of extended analysis options, enabling it to outperform the most comprehensive systems on the market in functionality. This also allows NOMAD to be an ideal laboratory tool for desktop analysis in the most demanding environments. NOMAD also sets a new benchmark of affordability in the industry.

Designed to replace old-school PCI cards, USB-based dongles and other laptop-dependent devices, NOMAD is a complete free-standing unit with its own CPU and can be left to monitor signals by itself without the need for a host system.

**“In-depth analytics for IP, OTT and DVB signal behaviorisms”**

## INCLUDED FACTORY FEATURES

## DEFAULT FEATURES OFFERED BY NOMAD

- ▶ 10/100/1000-T RJ45 Management port with Link and Activity LED indicators
- ▶ 10/100/1000-T RJ45 video port with Link and Activity LED indicators
- ▶ SFP gigE video port Optical networks
- ▶ 75 ohm BNC linespeed ASI input
- ▶ 75 ohm BNC ASI output port for loopthrough monitoring purposes
- ▶ 50 ohm SMA female 1PPS input port for GPS synchronisation
- ▶ USB Type-A connector for initial setup (back of unit)
- ▶ USB Type-A connector for WiFi dongle (dongle included at front of unit)
- ▶ Thumbnail decoding of uni/multicast IP transport streams with audio bars and metadata
- ▶ Framework called RDP for relaying any IP multicast monitored to a different IP destination for further analysis. Two independent relay engines are available (part of RDP framework)
- ▶ Functionality for recording 500MB of the whole or parts of any transport stream monitored (RDP framework). There are two independent RDP record engines
- ▶ Automatic record trigger based on up to 3 configured alarm criteria with pre fill in order to catch fault, ideal for autonomous fault capture. There are two independent record engines available (part of RDP framework). Recorded clips are automatically stored in 32GB SD card flash
- ▶ Flexible template based alarming system to allow custom configuration of what parameters result in an alarm being generated on a per-TS level
- ▶ NTP client time synchronization support according to RFC2030
- ▶ DHCP client support on management and video ports according to RFC2131
- ▶ Easy web-based software and license upgrade
- ▶ TR 101 290 monitoring and analysis on ASI, RF and IP inputs
- ▶ Full DVB and ATSC table support
- ▶ PSI/SI/PSIP table display - high and low level including hex dump and table download
- ▶ Analysis of EIT p/f and EIT Schedule
- ▶ MIP table analysis according to TR 101 190 and TR 101 191
- ▶ Unique tests designed by BRIDGE Technologies relevant to Conditional Access system

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## NOMAD - MEDIA PROFESSIONALS´ MOST VERSATILE COMPANION

### DEFAULT FEATURES CONT.

- ▶ TS 101 290 analysis functionality on all IP multicasts in either round-robin fashion across all monitored IP multicasts or continuously on all monitored IP multicasts
  - All Priority 1 tests (TS sync, Sync byte, PAT, CC, PMT, Missing PID)
  - All Priority 2 tests except Buffer Fill (Transport, CRC, PCR, PCR acc., PTS, CAT)
  - All Priority 3 tests (NIT, SI rep rate, Unref PID, SDT, EIT, RST, TDT)
  - Custom tests (CA system, PID bitrates, Service bitrates, MIP, Content)
- ▶ Framework for monitoring and alarming on max/min service bandwidth
- ▶ Framework for monitoring and alarming on max/min PID bandwidth
- ▶ Visual tree representation of all PSI/SI tables with drill-down functionality
- ▶ PID overview
- ▶ Service overview
- ▶ PCR Accuracy (PCR-AC) jitter histogram for selectable PIDs on IP/ASI/RF inputs
- ▶ PCR Overall Jitter (PCR-OJ) jitter histogram for selectable PIDs on ASI/RF inputs
- ▶ Intuitive bitrate overview - service and PID based
- ▶ Comparison framework where a visual comparison between two transport streams or two services is possible in terms of TR 101 290 parameters and table set
- ▶ Transport stream service status view with visual colour coded indication of problem areas
- ▶ TR 101 290 alarm trending graph over last 24 hours
- ▶ Condensed mosaic thumbnail view of all services monitored

## ADDITIONAL NOMAD OPTIONS

**EII-OPT** allowing the NOMAD to communicate with a Northbound interface to a central monitoring and analysis system

**STRM-OPT** for additional concurrent monitoring of IP multicasts (up to 4 additional STRM-OPT can be fitted for a total of 50 IP multicasts)

**ETR290-OPT** for additional individual concurrent TR 101 290 analysis on the IP input (up to 7 additional individual ETR290-OPT can be fitted)

**BULK-ETR290-OPT** for 25 concurrent TR 101 290 monitoring engines for IP multicasts

**EXTRACT-OPT** objective QoE content analysis and alarming

**OTT-ENG-OPT** for 4 additional OTT engines up to a total of 5. One is included by default. Each OTT engine allows 10 services with unlimited profiles to be analyzed

**VB1G2-OPT** to activate the second Gigabit Ethernet port on the unit allowing two independent Gigabit Ethernet IP ports to analyze OTT and/or IP uni/multicasts

## ADDITIONAL IP and STREAM OPTIONS

**IP-OPT** adds IP monitoring capabilities for up to 10 IP multicasts in parallel (included in NOMAD)

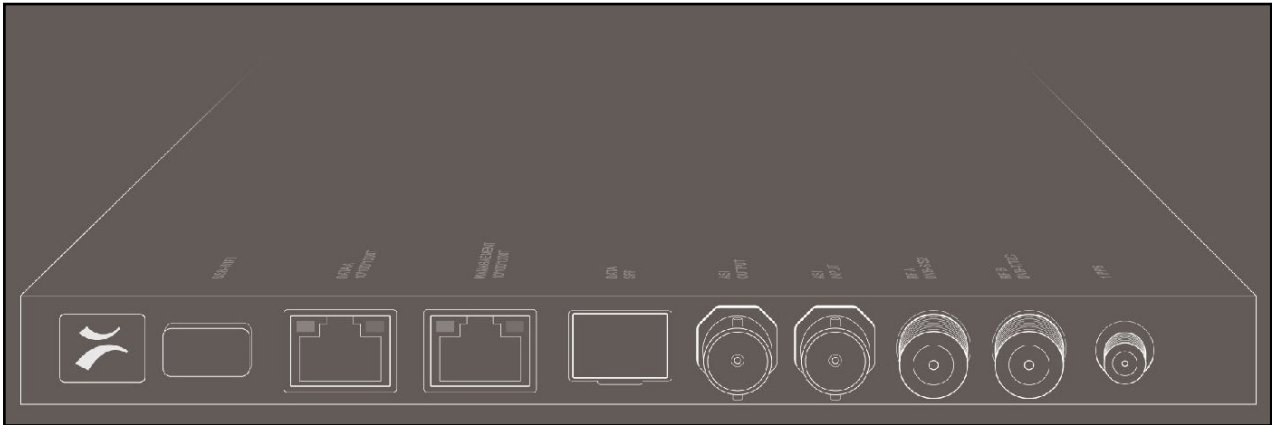
**STRM-OPTx1** adds 10 further multicasts to those 10 already present through IP-OPT for 20 in total (optional)

**STRM-OPTx2** adds 20 further multicasts to those 10 already present through IP-OPT for 30 in total (optional)

**STRM-OPTx3** adds 30 further multicasts to those 10 already present through IP-OPT for 40 in total (optional)

**STRM-OPTx4** adds 40 further multicasts to those 10 already present through IP-OPT for 50 in total (optional)

- ▶ Parallel and continuous monitoring of up to 50 IP unicasts/multicasts according to ETSI TS 102 034 (requires 1 IP-OPT and 4xSTRM-OPT):
  - Monitor current/min/max UDP payload bitrate
  - Monitor current/min/max TS payload not counting NULL TS packets
  - Count number of IP packets
  - Source/destination IP address
  - Type-of-Service field (TOS/DSCP)
  - Time-to-Live field (TTL)
  - VLAN ID, if appropriate
  - Max/min/average IP packet Inter-Arrival time (IAT) for jitter analysis
  - TS Continuity Counter errors
  - TS Sync errors
  - Media Loss Rate - number of TS packets lost
  - Delay Factor - time between IP frames
  - Source/destination MAC address
  - RTP dropped packets, duplicate packets, out-of-order packets
  - RTP max/min hole size, hole separation
  - Forward Error Correction analysis according to MPTE 2022 1-7 / COP3
- ▶ MEDIAWINDOW™ visualisation technology for trending packet loss, bandwidth and jitter over up to 4 days across all active uni/multicasts
- ▶ History graphs from last 4 days of NoSignal, CC-errors, RTP-drops, RTP-duplicates, RTP-Out-of-order, Total interface bitrate, Monitored bitrate, Ethernet CRC frame errors
- ▶ Framework for automatic detection of present multicast/unicast streams
- ▶ Flexible template based alarming system to allow custom configuration of what parameters result in an alarm being generated on a per-TS level
- ▶ Microsoft mediaRoom X-bit RTP header extension support
- ▶ Alarm on changes to TOS/DSCP and TTL for detection of changes in network prioritization
- ▶ Time loss distance measurements according to RFC3357
- ▶ IEEE 802.1Q VLAN tagging support for up to 20 individual VLANs with active IGMPv2/3
- ▶ Framework for automatic detection of present multicast/unicast streams



### INTERFACES

- USB-WiFi
- Data A 10/100/1000T
- Management 10/100/1000T
- Data B SFP
- ASI Output
- ASI Input
- RF A DVB-S/S2 Satellite
- RF B DVB-T/T2/C Terrestrial & Cable
- 1PPS
- Power 12V / Serial

### PHYSICAL

- Dimensions: width x length x height (mm): 180x230x20
- Weight: 0.9 kg
- Power usage (max): 22 Watts
- Power supply: External power unit +12V, 1.8A (included)
- Operating temperature: -20 up to +45 degrees C
- Operating humidity: 5% up to 95% non-condensing
- Initial setup by Wi-Fi, Ethernet or separate USB Type-A cable (included)