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**Cable Networks  
Product Selection Guide**



Wavetek Wandel & Goltermann's (WWG) CATV test and measurement equipment is designed for heavy duty field use, with "Find and Fix" features that help you solve network problems and minimize labor and training costs. All WWG products provide a full range of features packed in rugged, water resistant, lightweight packages. All CATV measurement and analysis tools are simple to use, with easy-to-read displays. With WWG's full range of CATV measurement equipment, installers, technicians and system engineers have all the tools needed for testing and monitoring system performance.

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MicroStealth Family

## MicroStealth Signal Level Meters

MicroStealth (MS) Signal Level Meters combine field durability, measurement precision, and affordability. From field maintenance to installation, to troubleshooting today's more advanced networks, there's an MS meter designed for every skill level of the cable TV installer or service technician.

All models offer multi-channel display, an icon-based user interface and a one-button Go/No-Go level check. From the MS1400, with digiCheck™ function and standard 5-850 MHz range and international language options, to the lower-end MS1000, the MicroStealth family offers a meter with the functions - and the budget - designed to meet your needs.

### MicroStealth Specifications

#### Frequency

**Range:** 45 to 550 MHz;  
5 to 890 MHz optional (standard on MS1400)  
**Accuracy:** 20 ppm  
Tuning Resolution: 25 kHz

#### Level Measurement

**Range:** -20 to +50 dBmV; 40 dBμV to 110 dBμV  
**Resolution:** 0.1 dB  
**Accuracy:** +/-0.75 dB Flatness; +/- 75 dB Linearity @ 25° C (77° F)

### MS1000 Specs

#### Six Channel Mode

**Number of Channels:** 6  
**Scan Rate:** <1 second

### MS1200/1300/1400 Specs

#### Scan Mode

**Number of Channels:** 120  
**Scan Rate:** Approximately 6 carriers/second

### MS1400 Specs

**Digital Average Power Level Measurement:** ±2 dB in digiCheck™ operation mode

## MS Family Features Comparison Chart

Features	MS1000	MS1200	MS1300	MS1400
6 Channel Scan	●	●	●	●
1-Key Installation Check	●	●	●	●
Tuning by Ch. or Freq.	●	●	●	●
Channel V/A Level & Delta	●	●	●	●
FCC Limit Check	●	●	●	●
Tilt Mode	■	●	●	●
Cloning	■	●	●	●
Prints Current Data	■	●	●	●
All Channel Scan	■	●	●	●
Customized Channel Plan	■	■	●	●
Stores Measurement Results	■	■	●	●
Prints Stored Results	■	■	●	●
Downloads to StealthWare	■	■	●	●
5 - 80 MHz Ingress Scan	■	■	●	■
5 - 890 MHz Ingress Scan	■	■	■	●
Digital Measurement	■	■	■	●
Leakage Upgrade	■	■	■	●
Multi-Lingual LCD Screen	■	■	■	●

System bandwidth expansion and digital service deployment have placed more stringent quality demands on the installer technician to protect video and data signal integrity to the paying customer. To ensure signal quality, the cable technician should be equipped with a signal level meter that provides advanced measurement capability while withstanding rigorous everyday field use. The MicroStealth family offers a complete line of tough, rugged meters designed to meet your testing needs.



MicroStealth 1400



CLI-1450

## CLI Leakage Meters

With the growing implementation of digital carrier transmission, guarding against ingress is vital. Most cable systems now require installers to certify installations by checking for leaks to help prevent ingress. Wavetek's CLI-1450 and 1750 leakage and combination meters offer the sensitivity and accuracy required for finding and measuring cable leaks, while providing a range of other features designed to meet your specific testing needs.

Users tune the CLI to a video carrier in the 115 to 140 MHz frequency range. An alarm can be configured to trip when it detects the presence of an RF signal at the tuned frequency. All CLI meters monitor and measure video carriers; therefore it's not necessary to inject an additional RF signal in precious spectrum to make accurate leakage measurements.

Along with the powerful leakage detection and measurement modes, the CLI-1450 provides all the standard features of WWG's Scanning Signal Level Meters, giving technicians the versatility needed for today's advanced networks. The CLI-1450 also offers the ingress scan function, which allows users to see interfering ingress signals in the forward or reverse band.

### CLI-1450 Specifications

#### Leakage Tuning Range

**Carrier Frequency Range:** 115 to 140 MHz (video)  
**Accuracy:** 10 ppm @ 25°C (77°F);  
 20 ppm over temp.  
**Resolution:** 25 kHz

#### Digital Average Power Level

**Measurement:** ±2 dB in digiCheck™ operation mode

#### Available Language Options

French, German, Dutch, Portuguese, Spanish, Italian

## CLI-1750/LST1700 Home Wiring Test Kit

The Home Wiring Test Kit (HWTK), comprised of the CLI-1750 and LST-1700 Signal Transmitter, performs a comprehensive set of tests to verify the quality of an installation: signal level, frequency response, frequency domain reflectometry (FDR), ingress scan, and leakage.

The Home Wiring Test Kit's frequency response measurement, or mini-sweep, identifies the presence of unterminated splitter ports or nonconforming components within home wiring. An FDR test reveals precise locations of reflection sources, degree of severity, and enables replacement of faulty cable or components.

Finally, the CLI-1750 can be used with the LST-1700 to locate leaks due to poor connections or faulty components, and assure users that no alarm conditions are being created by RF signals outside the network being monitored.

### CLI-1750/LST-1700 Specifications

#### Frequency Sweep

**Range:** 5 to 862 MHz  
**Frequency Accuracy:** 10 ppm @ 25°C (77°F); 20 ppm over temp.  
**Frequency Resolution:** 25 kHz, Min

#### LST-1700

**Output Level:** ±30 dBmV  
**Amplitude Accuracy:** ±1 dB  
**Amplitude Resolution:** 0.1 dB



CLI-1750 and LST1700

Digital services including audio, video, Internet and telephony are less tolerant than traditional analog services of frequency response problems, reflection, group delay and ingress. The Home Wiring Test Kit helps identify and locate potential problems with home wiring prior to activating these new digital services.



**SAM 4040D Signal Analysis Meter**

#### Key Features:

- Power level measurements can be made on TDMA ('burst') channels and continuous digital carrier channels
- Comprehensive time-domain displays about TDMA cable-modem signals
- In-service in-channel D/U (desired/undesired) measurements for TDMA cable-modem signals
- Detects signals as fast as 5  $\mu$ s—in both zero span, and continuous modes
- Built-in preamp and 50 MHz low-pass filter for tracking smaller signals, even through high-loss test points
- Expanded SPECTRUM mode

## SAM 4040D

The lightweight, rugged SAM 4040D Advanced HFC Signal Analysis Meter conducts comprehensive, troubleshooting, proof-of-performance measurements and preventive maintenance tests without interrupting subscribers' reception.

In addition to testing signal levels, hum, carrier/noise and depth of modulation, the 4040D provides Wavetek's trademarked Sweepless Sweep<sup>®</sup> feature in which active system carriers are measured and compared to a stored reference to determine system frequency response. The 4040D also provides a fast spectrum analyzer display, TDMA measurements, and a long-life battery.

### SAM 4040D Specifications

**Measurements:** Signal Level, Tilt, Scan, Sweep, Carrier to Noise, Hum, Depth of Modulation, CSO/CTB

#### Scan Mode

All video, audio, pilot carrier, and digital channel levels displayed

#### Spectrum Mode

**Sweep Rates:** ~1 second updates with spans of 50, 20, 10 and 5 MHz  
~1.7 second updates with 3 MHz span

#### Zero-Span Mode

**Time Domain Range:** 10  $\mu$ s/div to 2 s/div

## StealthWare

StealthWare software provides cable television managers, engineers, technicians and contractors with the ultimate data management tool for data and graph file archiving, analysis and report generation. Whether it is FCC proof tests, system sweeping or network troubleshooting, StealthWare quickly transfers all measurement data from field units to a PC for archiving, evaluation, exporting or printing.

Unit setup configurations, such as channel plans or test locations, can be created in StealthWare and downloaded to field instruments to maintain consistent measurement performance. StealthWare's Analysis Tool allows users to appraise the collected automated data from MicroStealth, CLI, SAM and Stealth tools and generate standard or customized reports. Data files may be viewed and printed in Table or Global format. Channel limits and Global limits may be applied to each format, with a color-coded alarm or warning indicator if a channel has exceeded a specified limit.

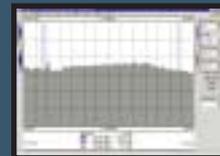
StealthWare also has a firmware upgrade feature which makes it easier and quicker to receive the latest enhancements and updates for WWG's field units.

#### Features:

- Easy-to-use Windows™ Application
- Archives Graph and Test Data
- Eliminates Field Printing
- Stores Data in Relational Database for Easy Filing and Searches
- Upload/Download Channel Plans
- Upgrades Field Units to Latest Firmware



**StealthWare**





Stealth Sweep system

## Stealth Sweep System

Network operators and contractors must test a variety of parameters throughout the coaxial RF portion of an HFC network. WWG's Stealth Sweep System is designed specifically for testing these networks, proving system performance and conducting preventative maintenance. Configurations are available for testing from the headend or the node, and for forward and reverse testing with as many as 10 technicians sweeping reverse at any given time.

The 3SR Receiver is a full-featured signal analysis meter, with a spectrum display and an analog representation of single channel measurement data. The 3SR references existing carriers, and the 3ST Transmitter transmits a sweep to fill vacant spectrum areas. The 3ST Transmitter also has all of the measurement capability of the 3SR Receiver.

### Stealth's Reverse Sweep Alignment Option

A Stealth Sweep System with a Reverse Sweep (3SRV) option allows simple testing of the frequency response of the reverse path – with an absolute level presentation. In other words, an advanced cablemodem simulator.

### Stealth Sweep Specifications

**Measurements/Modes:** Signal Level, Tilt, Scan, Sweep, Carrier to Noise, Hum, Depth of Modulation, Spectrum Mode, CSO/CTB

#### Frequency

**Range:** 5 to 1,000 MHz

**Accuracy:**  $\pm 10$  ppm @ 25°C (77°F)

**Drift Over Temp:**  $\pm 10$  ppm @ 25°C (77°F)

**Resolution Bandwidths:** 30, 280 kHz, 2 MHz

**Tuning Resolution:** 10 kHz

### Stealth Sweep System Components:

#### Model 3SR Sweep Receiver

- 3SRV (reverse option)
- 3SRT (reverse & transmitter option)

#### Model SSA-1000 StealthTrak Sweep Receiver

#### Model 3ST Sweep Transmitter

#### Model 3HRV Headend Reverse Sweep Receiver

## StealthTrak SSA-1000

Deployment of cable modems and digital set top boxes has increased the time and cost of maintaining CATV systems. The StealthTrak Sweep Receiver/Analyzer, the newest generation of the Stealth field meter, works with existing Stealth headend units to quickly and simply “find and fix” reverse path problems, helping reduce labor time and costs.

### Key Features:

- New impulse noise detector and more powerful spectrum analysis modes
- Built-in preamp and 50 MHz low-pass filter

### Complete Digital Measurements:

- Power level measurements can be made on TDMA ('bursted'), as well as continuous digital carrier channels.
- Time-domain displays provide more information about transmit levels; using zero-span measurements, each packet of data from a cable modem can be seen and examined.
- In-service in-channel D/U (desired/undesired) measurements for TDMA cablemodem signals.

### StealthTrak Specifications

#### Spectrum Mode

**Sweep Rates:** ~1 second updates with spans of 50, 20, 10 and 5 MHz

~1.7 second updates with 3 MHz span

#### Zero-Span Mode

**Time Domain Range:** 10  $\mu$ s/div to 2 s/div



StealthTrak



PathTrak™ Family

## PathTrak™

The **PathTrak Performance Monitoring System** is the first return path monitoring system dedicated to monitoring and analyzing multiple return paths in today's advanced HFC networks.

PathTrak is designed to help improve the availability and quality of return path networks while reducing the cost of maintenance. The PathTrak system is designed to improve the ability of office-based personnel and field technicians to operate and maintain high-quality service on advanced, two-way networks.

An intelligent, network-ready software system provides interactive live views and extensive historical summaries of system performance from a remote PC. Through faster troubleshooting, easy remote analysis, and proactive notification of problem conditions, maintenance costs are drastically reduced and quality of service is improved.

### Intelligent Data Handling

The PathTrak Return Path Monitoring System functions as a parallel multi-input, high-speed spectrum analyzer that is integrated with a sophisticated database management system. The system scans through individual return paths of an HFC system, and provides a complete statistical representation of noise on the return path, not just raw data. PathTrak notifies users when noise, ingress and other return path impairment problems are developing.

The PathTrak system provides early warning of potential return path problems, quickly isolates problems to a specific return path, and allows interactive remote analysis of system performance. In addition, extensive and continuous characterization of return path performance over time is recorded.

## PathTrak™ Components

### HCU1500 (or HCU400) Modular Controller

A 19" rack mounted control chassis provides local data storage, intelligence, and the communications interface point. The VME-based chassis contains 15 available slots (HCU1500), or 4 available slots (HCU400) for monitoring modules (RPM1000 modules). This provides a customizable and scalable system platform from which to build.

### RPM1000 Return Path Spectrum Analyzer Module

The RPM1000 modules provide programmable, high-speed spectrum analyzer functions for the 5-65 MHz frequency range. Each RPM1000 card has 8 discreet input ports.

### PathTrak™ System Software and System Controller

The Windows NT/95™ based software package centrally coordinates system status, and serves as the primary communications interface. The PathTrak software has a Client/Server architecture.

### PathTrak Specifications

#### HCU Units

**Data Storage Capacity:** 1 year of Performance History data

**Communication Ports:** four serial RS232, one 10/100 baseT Ethernet, one parallel port

**Power Supply:** AC auto-ranging 90-132VAC/180-264VAC @ 47-63Hz

#### RPM Modules

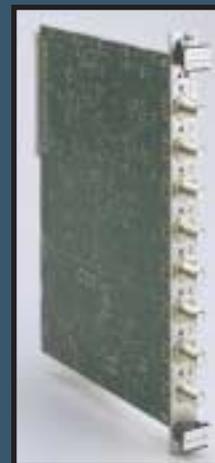
**Spectrum Analyzer Max Scan Speed:** 10 scans/second (500 points resolution, 25 microsecond dwell)

**Typical Spectrum Update Rate on Remote PC:** 5 scans/second

**Span:** 5-65MHz



HCU 1500



RPM1000

**MTS 5100****MTS 5100 Mini-OTDR**

- Accepts two field installable optical modules simultaneously
- Over 16 OTDR modules available
- VFL option at 635nm
- OTS modules with light sources and power meter
- Talkset option
- 1GB hard disk option

**MTS 5200****Full-Feature OTDR**

- All the features of the MTS 5100
- Optional internal printer
- Optional IEEE-488 GPIB interface

**RTU 95000 Rack OTDR**

- Up to 2 modules from the MTS family
- Up to 3 optical switch modules
- Rack mountable 4U
- Part of Atlas Remote Fiber Monitoring System (RFTS)

## OTDR

### MTS (Media Test Set)

OTDRs have become indispensable tools for testing optical networks providing incoming test, fiber plant construction, splicing, cable acceptance, and cable restoration. WWG's MTS OTDR family combines high performance

with improved test productivity, while enhanced modularity ensures that the unit can be field-configured for the future.

The MTS has a hardened outer casing with protective bumpers, making it ideal for outside plant testing. One-button testing for most applications makes field testing easy, along with a 16-hour battery life (two batteries). The MTS has a familiar, intuitive user interface, which allows simple one button testing in many applications. A large 8.4 inch color display option gives easy to read results for both the OTDR trace and the tabular event list.

MTS provides the user with an unprecedented level of speed, processing power, resolution and range. Its extremely short deadzones can be used for pinpointing faults close to cable junctions and splice points. Impressive dynamic range means that even the longest fibers can be characterized with confidence.

### Media Test Set Specifications

**Size and Weight**

300 x 235 x 90 mm / 11.8 x 9.25 x 3.5 in.

**5100:** 3.5 kg (7.7 lbs) with one module and one battery

**5200:** 5.5 kg (12.1 lbs) with 2 modules, 2 batteries and internal printer

**Power:** AC or DC with up to 2 NiMH batteries

**Safety:** IEC 825 Class 1

**Op. Temp:** -20 to +50°C (AC power, no options)

**Storage Temp:** -20 to +60°C

**Memory:** Internal, floppy disk, hard disk

## Handheld Optical Test

Wavetek Wandel & Goltermann (WWG) offers a complete line of rugged, handheld optical test equipment designed for field tasks related to installation, maintenance and troubleshooting of all types of optical networks.

WWG provides a full, economical range of high-quality optical handheld testers for all cable TV applications. Specially designed for Cable TV networks is the pocket-sized OLP-8 power meter, and the OLP-18B high performance power meter. Both are used for initial continuity check, to precision power level of CATV systems and attenuation measurements on optical fibers.

Both the OLP-8 and OLP-18B are the right choice for measuring high power levels. The OLP-18B provides additional benefits like large memory capacity for data storage according to the individual cable/fiber structure. The built-in RS232 interface enables easy data download for documentation or trend analysis.

## Fiber Optic Software

**FiberASSISTANT** - This powerful software package is available as an accessory to the OLP-18B. It simplifies data handling and report generation with automatic result qualification and convenient automatic data logging.

**WinTrace™** - A Windows™ compatible PC analysis package which can be used to process results for the MTS.

**OLP**

### Pocket-Sized Power Meter OLP-8

- Power Range: + 23 to -50 dBm
- Easy 3 button operation
- Universal Push Pull adapter (UPP)
- Extreme long battery life: >130 h
- 3 year calibration interval

### High Performance Power Meter OLP-18B

- Power Range: + 26 to -60 dBm
- Audible fiber identification
- Data storage for up to 1000 results
- RS232 for remote control and data download
- Interchangeable adapter system
- 3-way powering: AC-/battery/NiCds
- FiberASSISTANT-SW (optional)
- 3 year calibration interval



## CMS1000

The CMS1000 Monitoring System is a modular remote monitoring and control system. This easy-to-use, flexible package provides extensive RF signal measurement and analysis capability, and has the ability to monitor and control up to 200 remote headends or hub sites.

The CMS Monitoring System is comprised of a system headend monitor and control unit, model 3SM, based on Stealth technology. The 3SM is a full-featured signal analysis meter that provides comprehensive, non-intrusive signal testing. The CMS1000 Central Monitoring Software provides access to all information gathered in the 3SM, plus alarm notification, file storage, and remote system design.

## Benchmark 1175 Scalar Analyzer System

The Benchmark 1175 Scalar Analyzer System presents sophisticated scalar analyzer network measurements. This versatile sweep/scalar analyzer is used in multiple testing environments, such as production, product research, service, incoming inspection, repair, cellular communications, and the cable industry.

The Benchmark has a 75Ω output impedance, and provides highly accurate sweep response measurements of transmission loss, return loss, and absolute power for RF component production test facilities. Additionally, the Benchmark offers specialized measurement search routines for servicing all relevant CATV components.

### CMS1000

#### System Components:

##### Model 3SM

- System Headend Monitor

##### CMS1000

- Central Monitoring Software



### Benchmark

## DominoLAN Internetwork Analyzer

The DominoLAN analyzer handles the multiple protocols and topologies of today's complex internetworks. The analyzer monitors activity, decodes all major protocols, and generates network traffic on Ethernet and Token Ring (4 and 16 Mbit/s) interfaces. The DominoLAN is controlled by a notebook PC. By generating and receiving traffic simultaneously, the Domino is ideal for benchmarking routers, bridges, gateways, and other network equipment prior to installation or after an upgrade.

## ANT-20 Advanced Broadband Tester

The ANT-20 is a SONET/SDH/ATM analyzer designed for field maintenance, troubleshooting and servicing work. It is used for acceptance testing, installation, checking and operation of cable network backbones based on SDH SONET data transmission formats. The ANT-20 includes all standard interfaces without changing modules. Special modules are available (ATM) to support high data bandwidth testing like digital TV or high-speed internet access.

## DTS-A / DTS-400P MPEG-2/DVB and ATSC Testers

The DTS-A Transport Stream Analyzer monitors and provides detailed signaling analysis of MPEG-2 transport streams and supports DVB and ATSC standards. The DTS quickly isolates and diagnoses problems in the Digital Broadcast multiplex, and is used in digital TV related product development and support. The DTS-400P Digital Broadcast Monitoring System provides quality of service information, solves operational problems and improves the efficiency of maintaining the system.



### DominoLAN



### ANT-20



### DTS-A / DTS-400P



## Worldwide Customer Care

As a global leader in communications test solutions, Wavetek Wandel and Goltermann (WWG), is committed to all of your long-term technical needs. Our commitment extends long after the sale. You can feel confident that WWG provides the customer support you need should you have questions or experience any technical problems.

Repair, calibration, and technical support are examples of the after-the-sale commitment that WWG has invested in for many years. We have developed fully-equipped, highly-skilled Service Centers throughout the world to meet your service needs. We provide calibrations, upgrades and repairs in a cost-effective and timely manner, helping you reduce down time and increase productivity.

### Extend Your One-Year Warranty!

A proactive maintenance and calibration program is the best means of preserving your investment and assuring trouble-free and cost-effective performance for your business. The WWG CarePlan<sup>SM</sup> is a support solution with your best interest in mind, helping you better manage your maintenance needs and save you money. A WWG CarePlan can save you up to 30% compared to the cost of a single per-incident repair and calibration.

- Repairs
- Calibrations
- Product/Firmware Upgrades
- Technical Support
  - Phone Support
  - On-line help ([www.wavetek.com](http://www.wavetek.com))
- CarePlan (Extended Warranty) Options:
  - Calibration Plus
  - Repair Only
  - Maintenance Plus (Repair and Calibration)
- Training

## CATV Technology Training

Wavetek Wandel and Goltermann has developed a comprehensive CATV technology-based training program, covering everything from cable basics to advanced techniques for managing the return path. This program is designed to meet your specific training needs by offering local seminars, or developing customized, on-site, on-the-job application training.

WWG's training is designed to address the changing maintenance and monitoring needs of today's "Digital Age". The seminars will help your staff understand emerging technologies and apply the state-of-the-art techniques required to furnish dependable quality service your customers expect.

In addition to seminars conducted at the **Cable Networks Division** in Indianapolis, regionally-based seminars, or local seminars - at your facility - can be given. WWG's professional training staff can also work with you to develop on-site, on-the-job training sessions. Training can be conducted in both a classroom setting, and in the field on real life situations with your maintenance team.

### Training Seminars:

- CATV Basics
- Fiber Optics
- Sweep and Balance Forward and Return
- Mastering the Forward Path
- Mastering the Return Path

### Customized Training:

- Customized training and consultation programs are offered
- Can be conducted at the facility of your choice

Check our website for the most up-to-date seminar schedule.

[www.wavetek.com](http://www.wavetek.com)