

## MicroStealth

### Signal Level Meter



System bandwidth expansion and digital service deployment have placed more demands on installers and service technicians. Today's installers require a signal level meter that combines advanced measurement capability with the ruggedness needed for everyday field use.

The MicroStealth family of SLMs offers comprehensive, reliable measurement performance for every skill level of the cable networks technician and engineer. From field maintenance to installation, to troubleshooting today's more advanced networks, there is a MicroStealth designed to meet your specific testing needs. All models quickly locate, analyze, and repair network trouble, but each have additional features unique to specific testing and maintenance requirements.

#### **Faster "Find and Fix"**

The MicroStealth design enables installers to do their jobs faster and easier. First, all meters are lightweight and easy to carry, yet durable and water-resistant. Second, all have a user-friendly, icon-based user-interface. The simple icons are used in all MicroStealth meters, and all other WWG field meters. This translates to less training and less downtime for field technicians & installers. Finally, the user interface is also available in international languages, allowing for ease of use throughout the world.

- Meeting every feature and requirement needed in a signal level meter
- User-friendly icon-based user interface used throughout the entire WWG product line; multi-language operator screens available
- Efficient and high repeatability; Automated Testing; Convenient proof-of-performance compliance testing. Tests can be done immediately and seen on screen or scheduled over a period of time and printed at a later date
- 95% of all forward and reverse ingress and interference is located in the distribution and home network. Advanced ingress spectrum scan helps you locate the source fast and easy
- Complete digital measurement solution for DTV and cable modem signals. digiCheck™ average power measurement including auto limit check

### MicroStealth's Power-Packed Features

Installing and maintaining today's cable networks can be challenging, but the MicroStealth meters make it easy. Choose the features that meet your requirements.

Features	MS1000	MS1200	MS1300	MS1400
Icon Driven User Interface	●	●	●	●
6 Channel Scan	●	●	●	●
Installation Check	●	●	●	●
Configure by Channel or Frequency	●	●	●	●
Channel Video/Audio Level & Delta	●	●	●	●
FCC & CENELEC Limit Check	●	●	●	●
Tilt Mode		●	●	●
Cloning		●	●	●
Prints Current Data		●	●	●
All Channel Scan/Full Scan		●	●	●
Ingress Scan in Reverse Band		○	○	●
Ingress Scan in Forward Band			○	●
Customized Channel Plans			●	●
Stores Measured Results/Screens			●	●
24 Hour - Auto Test			●	●
Prints Stored Results			●	●
Downloads to StealthWare			●	●
digiCheck™ - Digital Measurement				●
Digital & Analog Limits				●
Multi-Lingual LCD Screen				●

● Standard Feature  
○ Option Available

Frequency Ranges	MS1000	MS1200	MS1300	MS1400
Standard Frequency Range	45-550 MHz	45-550 MHz	45-550 MHz	5-890 MHz
Optional Frequency Range	45-890 MHz	5-890 MHz	5-890 MHz	N/A

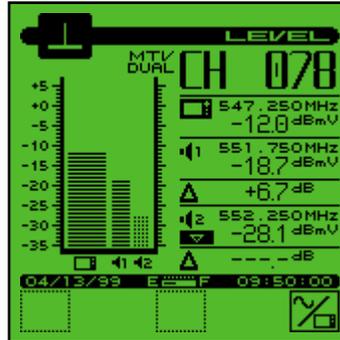
Upgradable to	MS1000	MS1200	MS1300	MS1400
MS1200	●	N/A	N/A	N/A
MS1300	●	●	N/A	N/A
MS1400	—	—	—	N/A
CLI-1450	—	—	—	●
CLI-1750	—	—	—	●

● Yes, Upgradable

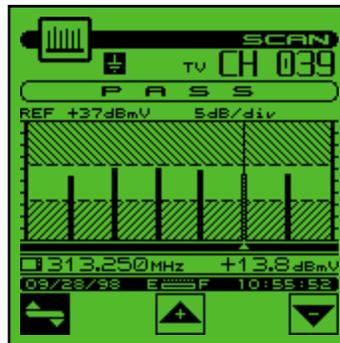


### Level Measurement

The MicroStealth provides a comprehensive single-channel display and a multi-channel display with pass/fail indicators. This quickly and clearly indicates if all channels are being received at the subscriber's drop at appropriate system design levels.



◀ The single channel display shows the video and audio carrier levels and the difference between levels. Compatible with dual sound and NICAM.



◀ The six-channel scan shows six different user defined video carriers, with pass/fail indicators for user-defined limits.

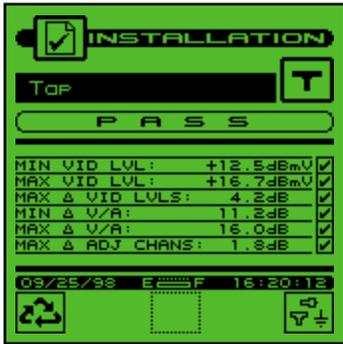


◀ The Full Scan display shows all user-defined video carriers. The unique limit check feature quickly checks the results against user-defined analog and digital limits (MS1200, MS1300, MS1400).



### Installation Check

Pressing the "✓" key, provides an installation status check which allows users to verify all levels are within user-defined limits. Up to four different limits can be configured: tap, ground block, subscriber drop, and custom. This feature can be used to determine if a subscriber connection meets cable networks or government specifications.



The results are displayed in a list indicating which parameters are out of tolerance. If all levels are within limits, a "✓" will be in the right far column. If any parameter is out of tolerance an "x" will be shown.



Pressing the "cycle" soft key provides more detail by bringing up a list of all channels. Passing channels have a "✓" in the right hand column.

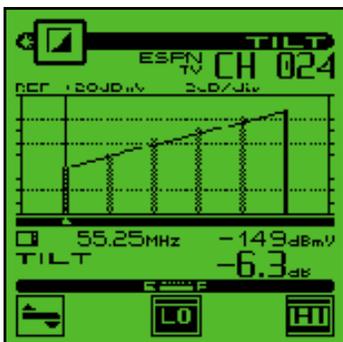


Pressing the "cycle" soft key provides a detailed view of what specific error is on the specific channel.

These results can be printed, (MS1200, MS1300, MS1400) or downloaded into the PC for report generation using StealthWare™ (MS1300, MS1400).

## Tilt Mode

Tilt measurement is a fast and effective method to balance line extenders and in-home amplifiers.



The tilt display provides a display of six channels that updates in less than a second (MS1200, MS1300, MS1400).

## Customized Channel Plans

Channel plans can be built, stored, and edited. This is convenient if you use the meter for more than one plant. You can quickly select the correct channel plan at which you are working. It's only necessary to build a channel plan once. A "cloning" function makes it possible to easily transfer channel plans from one field instrument to the other. StealthWare™ software enables you to upload and download channel plans from your PC to the meter (MS1300, MS1400).



## Auto Test

To certify that the network termination and home network are within the specifications, or for proof-of-performance compliance data, an auto-test can be performed. Test can be executed immediately or scheduled over a period of time. When configuring an Auto Test, you can record information about the location at which the test is being performed. Files can be created for commonly tested locations so you need only enter the information once. You can print a test report for each interval, or a comprehensive 24 hour report that summarizes data collected from up to four intervals.



Auto Test results are time, date, and temperature stamped and can be stored, viewed, printed or uploaded to StealthWare software (MS1300, MS1400).

## Ingress Scan

The innovative ingress scan mode finds forward and reverse ingress problems from the tap to the drop. Start/stop frequencies, resolution, and dwell time are programmable in the set-up menu. The operator can also set a limit threshold for simple identification of problem drops. To check for intermittent ingress, the meter can be adjusted to the peak hold mode to capture transient signals. Ingress scan displays can be saved for later printing or uploading to StealthWare software.

Testing the reverse path spectrum for sub-band signals being generated in the drop system improves the effectiveness of finding ingress sources and common path distortions.



Intermittent ingress captured by peak hold.

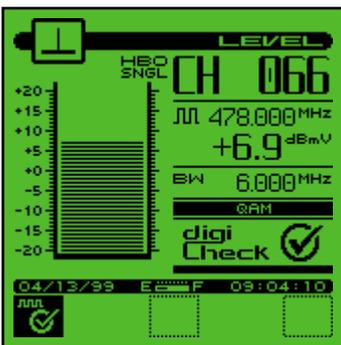
▲ A display of the spectrum with clear pre-set limits allows the installer to easily identify ingress. All intermittent ingress is detected through flexible dwell-time setup (MS1400).

### digiCheck digiCheck Digital Signal Measurement

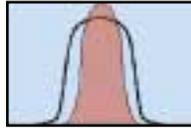
Making accurate digital average power and performance measurements are addressed with the digiCheck™ measurement function (MS1400). The digiCheck™ average power measurement takes small slices of the integrated RF-energy, summing them together to provide one total power reading. It takes into account the channel flatness of the digital carrier itself.



▲ Digital-TV and forward cable modem signal.

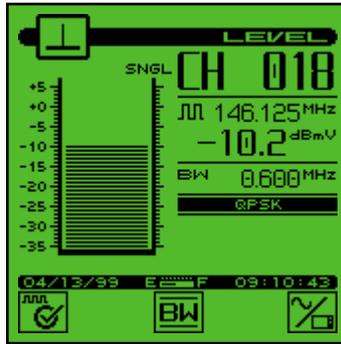


▲ The digiCheck™ method of measuring the total integrated RF-power under the haystack is very reliable and accurate. All level readings are fully compensated for by the correct occupied bandwidth.



“Small-band” digital signals are like cable telephone carriers.

“Small-band” digital carriers, like cable telephony require a different measurement technique. For that purpose, the digiCheck™ feature offers a time average as well. Even in this case, all level readings are fully compensated for by the correct occupied bandwidth.



### Digital & Analog Limits

Cable networks have analog and digital carriers. The levels of analog and digital signal measurements are different according to standards and regulations. Digital signals are typically 6-14 dB below analog signals. Users can enter minimum and maximum digital channel level limits separately from analog limits. Scan Mode, Installation Check, and Auto Test will accurately measure both digital and analog signals. This allows easy identification of the pass/fail condition of both channel limits sets.



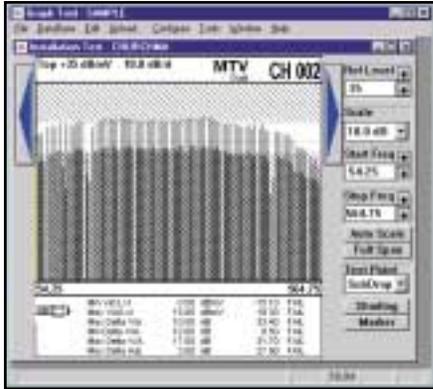
▲ The MS1400 has a limit set for analog channels and a limit set for digital channels.

- Single Channel Display and Six Channel Scan have Pass/Fail indicators for quick performance
- Installation Check - Ensures FCC and CENELEC compliance, reducing subscriber call-backs
- Scan Mode - Shows all channel levels at once, graphically identifying problems quickly and easily.
- Channel Plans - can be stored, built, edited
- Ingress Scan Mode - allows users to find forward and reverse ingress problems from the tap to the drop
- digiCheck™ Digital Signal Measurement - Measures DVB, Digital TV, Cable Modem, Internet, and Telephony on-cable services
- International Languages - Available on the LCD screen allowing the user to learn and read the meter in their local language:
  - ~ Portuguese
  - ~ Italian
  - ~ Spanish
  - ~ German
  - ~ French
  - ~ Dutch

Dotted line indicates trim. Do not print?

## StealthWare™ Software

Signal level measurements can be uploaded for storing, viewing, and printing. StealthWare™ allows you to build channel plans and test locations which can be downloaded to the field meter (MS1300, MS1400).



## Multi-Lingual LCD Screen

The user interface is now fully converted in the international language requested: French, Portuguese, German, Spanish, Italian, and Dutch (MS1400).



## Upgradable to Leakage

The meters can be factory upgraded to a CLI-1450 to add leakage detection. They can also be upgraded to a CLI-1750, which when communicating with the LST-1700 transmitter, provides more installation test tools: mini-sweep and frequency domain reflectometry (MS1400).

## Product Information

1010-00-0341:	MS1000
1010-00-0347:	MS1200
1010-00-0348:	MS1300
1010-00-0448:	MS1400

## Options and Accessories

### Model MS1000 / MS1200 / MS1300

Includes a battery cartridge, one charger/AC adapter, operating manual and one spare input connector.

MSUHF:	Frequency extension to cover range: 45 to 890 MHz
1019-00-0476:	MicroStealth Soft Carrying Case
1019-00-0480:	Multiple battery cartridge charger
4010-00-0114:	Charger/Adapter 120VAC to 12VDC
1019-00-0473:	Charger/Adapter 220VAC to 12VDC
1219-00-1223:	Spare battery cartridge
MBC-6:	Multiple 6-bay battery cartridge charger

### Model MS1200 / MS1300

MSSUB:	Frequency extension to include 5 to 45 MHz and reverse ingress scan mode
1019-00-0470:	Cloning Cable
P-Stealth:	Portable serial thermal fusion printer kit (same as that used for Stealth products [Citizen PN60]; cable not included)
1019-00-0468:	P-Stealth printer cable
1019-00-0467:	Generic serial printer cable - 25 pin male connector
1019-00-0469:	MicroStealth to PC Cable

### Model MS1400

1019-00-0476:	MS1400 Soft Carrying Case
1019-00-0470:	Cloning Cable
1019-00-0558:	Charger/Adapter with universal input, 12VDC output
1019-00-0554:	European Charger/Adapter (CE compliant)
4010-00-0119:	Charger/Adapter, 120 VAC to 12VDC
1019-00-0479:	Spare Battery cartridge
1019-00-0468:	P-Stealth printer cable
1019-00-0467:	Generic serial printer cable- 25 pin male connector
1019-00-0469:	MicroStealth to PC cable
1019-00-0592:	Replacement RF input connector, f type Female/Female
1019-00-0557:	Cigarette Lighter Adapter
1019-00-0480:	MBC-6 Multiple 6-bay battery cartridge charger
1019-00-0553:	P-MSCLI Printer Portable serial thermal fusion printer kit
1019-00-1227:	OPT, Pilot Certification

# Specifications

	<b>MS1000</b>	<b>MS1200</b>	<b>MS1300</b>	<b>MS1400</b>
<b>Frequency Range:</b>	45 to 550 MHz	45 to 550 MHz	45 to 550 MHz	5 to 890 MHz
Option SUB:	N/A	5-45 MHz	5-45 MHz	N/A
Option UHF:	45 to 890 MHz	45 to 890 MHz	45 to 890 MHz	NA
Accuracy:	+/-10 kHz@25 C (=-20 kHz over temp.)			
Tuning Resolution:	25 kHz	25 kHz	25 kHz	25 kHz
<b>Level Measurement in dB</b>				
Range:	-20 to +50 dBMV			
Resolution:	0.1dB	0.1dB	0.1dB	0.1dB
<b>Accuracy</b>				
Flatness:	+/-0.75 dB Flatness	+/-0.75 dB Flatness	+/-0.75 dB Flatness	+/-0.75 dB Flatness
Linearity:	+/-0.75 dB Flatness	+/-0.75 dB Flatness	+/-0.75 dB Flatness	+/-0.75 dB Flatness
digiCheck™:	N/A	N/A	N/A	+/-2dB
<b>Six Channel Mode</b>				
Number of Channels:	6	6	6	6
Scan Rate:	< 1 second	< 1 second	< 1 second	< 1 second
<b>Full Scan Mode</b>				
Number of Channels:	N/A	120	120	120
Scan Rate:		Approx 6 carrier/second	Approx 6 carrier/second	Approx 6 carrier/second
<b>General Dimensions:</b>				
Weight:	4.25"W x 10"H x 2.5"D 0.8 kg. (1.75 lb)	4.25"W x 10"H x 2.5"D 0.8 kg. (1.75 lb)	4.25"W x 10"H x 2.5"D 0.8 kg. (1.75 lb)	4.25"W x 10"H x 2.5"D 0.8 kg. (1.75 lb)
Operating Temp Range:	10 to 50 C (14 to 122F)			
Water Resistant:	Exceeds MIL-STD-810D	Exceeds MIL-STD-810D	Exceeds MIL-STD-810D	Exceeds MIL-STD-810D
<b>Powering</b>				
Battery Life:	3 hrs/replacement battery	3 hrs/replacement battery	3 hrs/replacement battery	3 hrs/replacement battery
Charge Time:	16 hrs unit off 30 hrs slow charge (unit on)	16 hrs unit off 30 hrs slow charge (unit on)	16 hrs unit off 30 hrs slow charge (unit on)	16 hrs unit off 30 hrs slow charge (unit on)

## Wavetek Wandel Goltermann Sales Offices

### North America

1030 Swabia Court  
P.O. Box 13585  
Research Triangle Park, NC  
27709-3585  
Tel. +1 919 941-5730  
Fax +1 919 941-5751

### Latin America

Av. Eng. Luis Carlos Berrini,  
936-8/9. andar  
04571-000 Sao Paulo, SP  
Brazil  
Tel. +55 11 5503 3800  
Fax +55 11 5505 1598

### Asia-Pacific

PO Box 141  
South Melbourne, Victoria  
3205  
Australia  
Tel. +61 3 9690 6700  
Fax +61 3 9690 6750

### West Europe

Arbachtalstrasse 6  
D-72800 Eningen u.A.  
Germany  
Tel. +49 7121 86 2222  
Fax +49 7121 86 1222

### Internet Address

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

### East Europe

Postfach 13  
Elisabethstrasse 36  
A-2500 Baden  
Austria  
Tel. +43 2252 85521 0  
Fax +43 2252 80727

### CIS Countries

1st Neopalimovskiy per.  
15/7 (4th floor)  
119121 Moscow  
Russia  
Tel. +7 095 248 2508  
Fax +7 095 248 4189

