SignalOn® Series

D3.1/CCAP™ Compliant

1.2 GHz

RF Passive Modules

INSTALLATION & OPERATION MANUAL

TABLE OF CONTENTS

Index of Figures and Tables

About This Manual

The SignalOn Series is a modular system consisting of a 4-position, 8-position, or 20-position chassis and modules for combining and splitting of the headend signals in a CATV system. The system is designed to accommodate superior cable management and ease of use.

Admonishments

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment. An admonishment identifies a possible hazard and then explains what may happen if the hazard is not avoided. The admonishments — in the form of Dangers, Warnings, and Cautions — must be followed at all times. These warnings are flagged by use of the triangular alert icon (seen below), and are listed in descending order of severity of injury or damage and likelihood of occurrence.

⚠️ **Danger:** *Danger is used to indicate the presence of a hazard that **will** cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*

⚠️ **Warning:** *Warning is used to indicate the presence of a hazard that **can** cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*

⚠️ **Caution:** *Caution is used to indicate the presence of a hazard that **will** or **can** cause minor personal injury or property damage if the hazard is not avoided.*

General Safety Precautions

⚠️ **Warning:** *Never install equipment in a wet location or during a lightning storm.*

Certification UL/ETL/CSA Listed

The SignalOn Series passive products have been tested and found to comply with the requirements of UL/CSA 60950.

Standards

The following listing is a bibliography of applicable ANSI and Bellcore documents:

MIL-STD-202   Test Methods for Electronic and Electrical Component Parts
UL 60950   Safety, Telephone Equipment

List of Acronyms and Abbreviations

The acronyms and abbreviations used in this manual are detailed in the following list:

AWG	American Wire Gauge
ANSI	American National Standards Institute
CPE	Customer Premise Equipment
CI	Customer Interface
FCC	Federal Communications Commission
GND	Ground
MBB	Make-Before-Break
MON	Monitor
NID	Network Interface Device
RCV	Receive
XMT	Transmit

GENERAL DESCRIPTION

1. General Description

The SignalOn Series is a modular system allowing for combining and splitting of the headend signals in a CATV system. The system is designed to accommodate efficient cable management, EMI shielding, and ease of use. All of these help to facilitate easy reconfiguration and high performance within a dynamic headend environment.

1.1. Splitters/Combiners

Splitters and combiners are modular devices designed to slide into a chassis and secured by thumbscrews. They are available in a plain style or pads-and-monitor style. Modules have BNC or F type connectors for customer connections. A variety of splitters and combiners may be installed in each chassis.

1.1.1. Pads-and-Monitor Style Splitters and Combiners

Splitters and combiners with monitor ports are available with either 0 dB or 6 dB default attenuation. Module attenuation default value, module type, and monitor information is noted on the blue label located at the top of each module. For example, the label shown in Figure 1 indicates that this is a combiner module; it is a 3-up, 2-to-1, with on-board default attenuation of 0 dB. It also has three monitor ports all 20 dB down from the common port. Attenuation pads may be installed to change the attenuation from 0 to 20 dB.

```
COMB  |MON
3X[2:1]|20dB
 DEFLT |20dB
  0dB  |20dB
```

Figure #1: Module Label

Pad contacts are make-before-break (MBB). This means that without an attenuator in place, the make-before-break contact is closed, providing the on-board default attenuation value to the circuit. When an attenuator pad is inserted, the make-before-break contacts open, routing the signal through the attenuator, replacing the on-board default attenuation value of 0 dB or 6 dB with the value of the attenuator pad. A monitor port is included on the padded modules, providing a –20 dB reference signal with high isolation between the monitor and input ports. See schematic on each module for details.

1.1.2. Pads

The attenuation pads used in these modules are available with insertion loss values of 0 to 20 dB in 1 dB steps and are for use in the frequency range: 5 MHz to 1,000 MHz.

1.1.2.1. Changing Attenuation Pads

When make-before-break modules are used attenuation pads may be changed without interrupting the signal. Attenuation pad value is stamped on the front of each pad. Determine new attenuation value required. Remove the existing attenuation pad and install a new pad with the appropriate value as follows:

1. Remove protective cover from the front of the module by loosening the thumbscrew.
2. Grasp the pad to be changed and pull it straight out of the module.
3. Position new pad in the module and press straight into place.
4. Replace protective cover on the front of the module and hand-tighten the thumbscrew.

1.2.   Diplex Filter Module

SignalOn diplex filter modules allow for passive band splitting of both forward, and reverse signals. Each module houses three separate diplex filter circuits. All circuit connections are accessible on the rear of the module housing. Attenuator pads, and test points similar to splitter/combiner modules are not available on this module.

1.3.   Condition & Monitor Module

The condition and monitor module allows a signal to be passed through two make-before-break pad sockets before being monitored by a –20 dB directional coupler. This allows a technician the ability to use one pad socket for padding and one pad socket for equalization. A simplified Condition and Monitor schematic is shown in Figure 2.
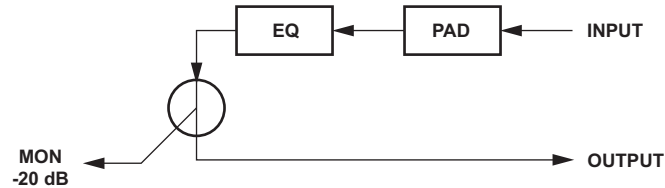
Figure #2: Condition and Monitor Module Schematic

FUNCTIONAL DESCRIPTION

2. Functional Description

Figure 3 shows a Make-Before-Break (MBB) Splitter/Combiner block diagrams. Figure 4 shows a generic block diagram of a Splitter/Combiner.
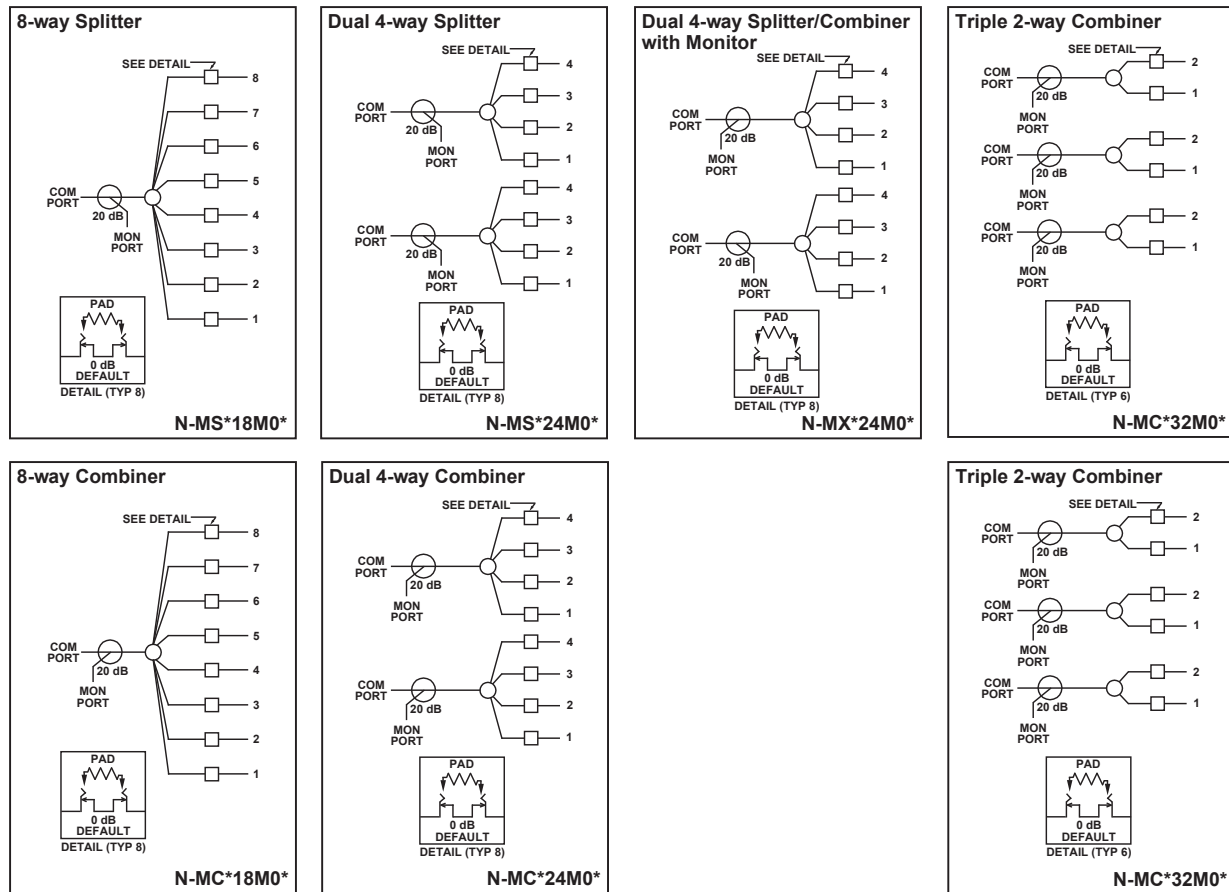
Figure #3: Make-Before_Break (MBB) Splitter/Combiner Module

Plain 8-way Splitter/Combiner

COM PORT — 8, 7, 6, 5, 4, 3, 2, 1

N-MP*18*

Plain 4-way Splitter/Combiner

COM PORT — 4, 3, 2, 1

N-MP*14*

Plain Dual 4-way Splitter/ Combiner

COM PORT — 4, 3, 2, 1

COM PORT — 4, 3, 2, 1

N-MP*24*

Plain 2-way Splitter/Combiner

COM PORT — 2, 1

N-MP*12*

Plain Triple 2-way Splitter/ Combiner

COM PORT — 2, 1

COM PORT — 2, 1

COM PORT — 2, 1

N-MP*32*

Figure #4: Plain Splitter/Combiner Module

PLANNING

3. Planning

Several things need to be considered when planning for the location of the SignalOn Series chassis. Some of these are:
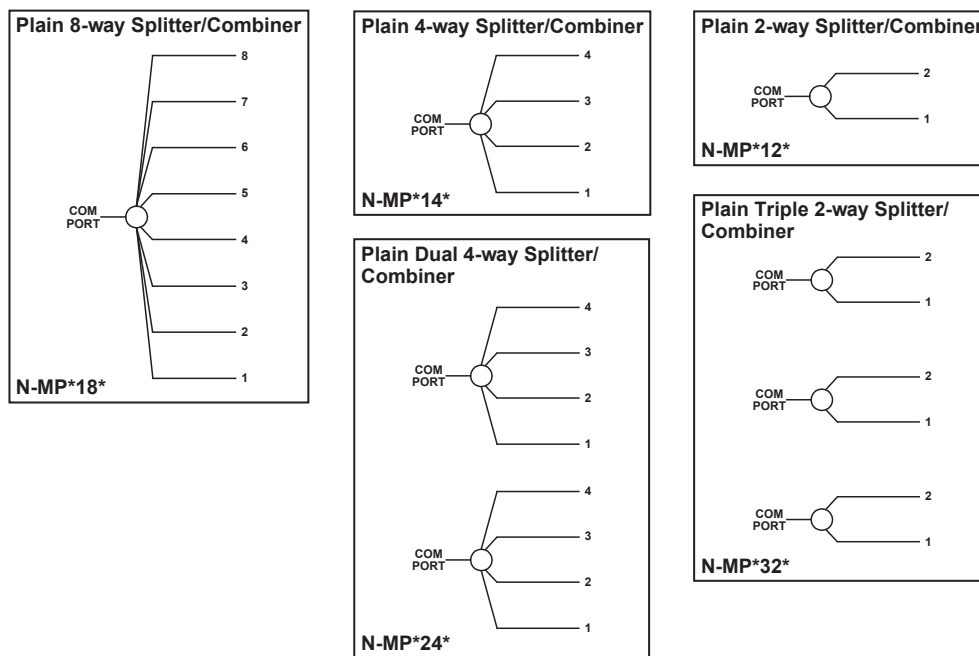
- Chassis should only be installed in restricted access areas (dedicated equipment rooms, equipment closets, etc.) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.
- When using open relay-rack style network bays, spacing between bays and at lineup ends may be required depending on the quantity and type of coaxial cable entering the bays. When spacing bays 0, 5, or 10 inches, verify that vertical jumper rings will fit between bays.
- A fully loaded chassis may terminate up to two-hundred cables. Consideration should be given to the number of chassis installed in a rack to prevent cable congestion.
- Allow sufficient room for cable management behind the chassis. Also leave sufficient vertical and horizontal cable pathways above and below the chassis.

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OPERATION

4.   Operation

There are no specific operating instructions for the passive components covered in this user manual. Once they are installed in their respective chassis, they perform their designated RF passive signal management functions (splitting or combining) without further attention.

4.1.   Module Applications

4.1.1. Combining

In traditional combining applications (Figure 18), the SignalOn Series modules mount conveniently at the top of a modulator bay.
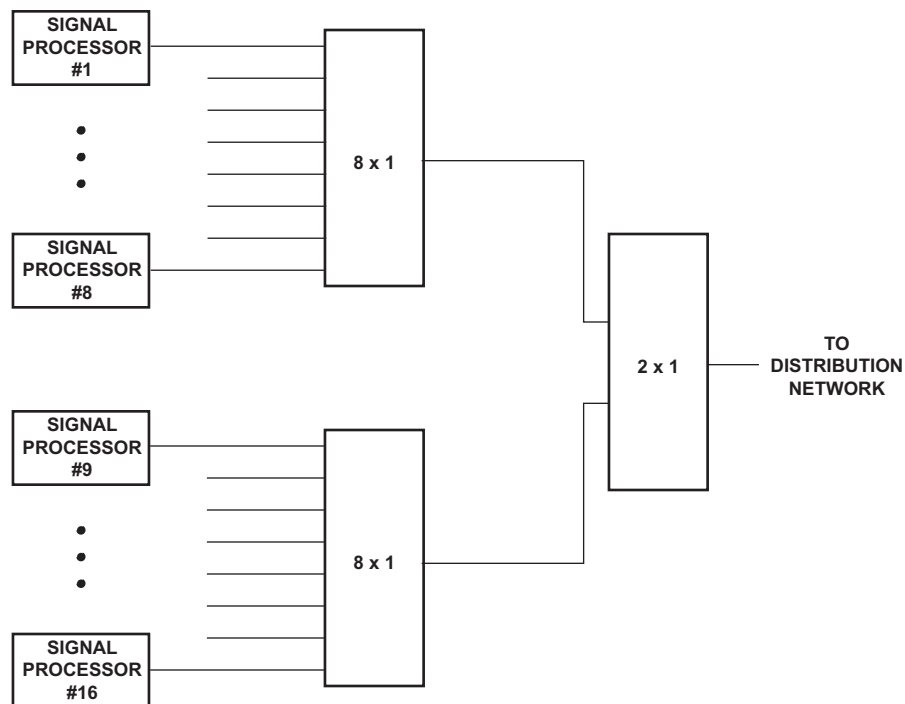
Figure #5: Combining 16 Input Signals

4.1.2. Distribution

For traditional distribution applications (see example in Figure 19), the SignalOn Series modules provide the splitting function with multiple splitting ratios and a high-density rack mount solution. Splitting modules are available with a variety of splitting ratios.
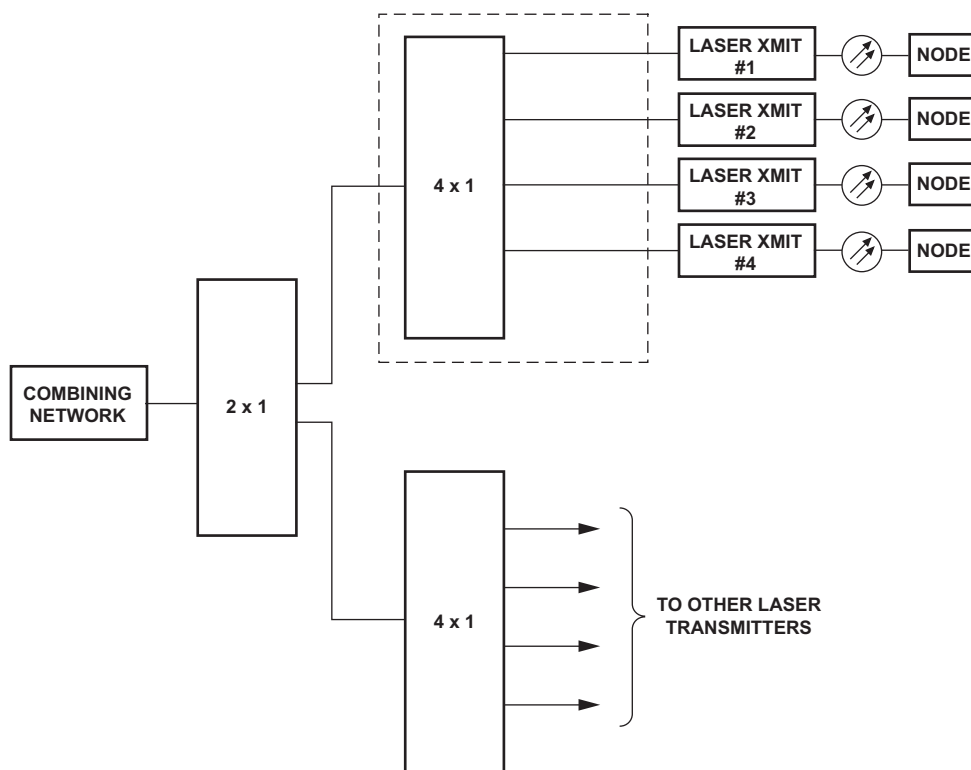
Figure #6: Distributing Signals

MAINTENANCE

5.   Maintenance

Maintenance requirements for the SignalOn Series passive components covered in this manual are minimal, consisting merely of periodic cleaning.

5.1.   Preventive Maintenance

NOTE: There are no customer serviceable parts in any of the components in this system; return all failed components to ATX Networks for service or repair. Opening the module voids all applicable warranties.

The outside of the chassis and passive components should be cleaned during routine office equipment maintenance. Care must be taken to prevent dust and dirt from getting into any of the coaxial jacks or connectors.

For any repairs, contact ATX Networks at the telephone number listed in Section 9, Service & Support, of this manual.

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SPECIFICATIONS

6. Specifications

Physical and environmental specifications are noted in Table 1. Module specifications are given in Table 2, through Table 16.

SPECIFICATIONS		8-WAY WITH TP & MBB				DUAL 4-WAY WITH TP & MBB				TRIPLE 2-WAY WITH TP & MBB			
		N-M**18M0		N-M**18M0H		N-M**24M0		N-M**24M0H		N-M**32M0		N-M**32M0H	
FREQUENCY RANGE	$F_{min} - F_{max}$	5 MHz	1002 MHz	5 MHz	1218 MHz	5 MHz	1002 MHz	5 MHz	1218 MHz	5 MHz	1002 MHz	5 MHz	1218 MHz
MEASUREMENT	FREQUENCY	Min (dB)	Max (dB)	Min (dB)	Max (dB)	Min (dB)	Max (dB)	Min (dB)	Max (dB)	Min (dB)	Max (dB)	Min (dB)	Max (dB)
INSERTION LOSS	5 MHz	11.9	12.9	9	11	8.1	9.1	6.3	8.3	4.1	5.1	2.7	4.7
	50 MHz	11.9	12.9	9.1	11.1	8.1	9.1	6.4	8.4	4.1	5.1	2.7	4.7
	550 MHz	11.9	12.9	10.3	12.3	8.1	9.1	6.9	8.9	4.1	5.1	3.2	5.2
	870 MHz	11.9	13.1	11.1	13.1	8.1	9.3	7.3	9.3	4.1	5.3	3.5	5.5
	1002 MHz	11.9	13.1	11.5	13.5	8.1	9.3	7.5	9.5	4.1	5.3	3.6	5.6
	1218 MHz			12	14			7.9	9.7			3.8	5.8
FLATNESS	50-F_{max} MHz		< 1.0		< 0.7		< 1.0		< 0.6		< 1.0		< 0.5
TEST POINT	5-F_{max} MHz	19.2	20.8	19	21	19.2	20.8	19	21	19.2	20.8	19	21
RETURN LOSS	5-50 MHz	16		16		16		16		16		16	
	50-1002 MHz	20		20		20		20		20		20	
	1002-1218 MHz			18				18				18	

NOTE:
** - 1st * = S (splitter), C (combiner) or X (one splitter, one combiner); 2nd * = F or B (BNC) connectors. BNC not available in "H" (1218 MHz) versions.

Table #1: Make-Before-Break (MBB) Splitter/Combiner Module Specifications

SPECIFICATIONS		PLAIN 8-WAY				PLAIN SINGLE/DUAL 4-WAY				PLAIN SINGLE/TRIPLE 2-WAY			
		N-MP*18		N-MPF18H		N-MP*14 / N-MP*24		N-MPF24H		N-MP*12 / N-MP*32		N-MPF32H	
FREQUENCY RANGE	$F_{min} - F_{max}$	5 MHz	1002 MHz	5 MHz	1218 MHz	5 MHz	1002 MHz	5 MHz	1218 MHz	5 MHz	1002 MHz	5 MHz	1218 MHz
MEASUREMENT	FREQUENCY	Min (dB)	Max (dB)	Min (dB)	Max (dB)	Min (dB)	Max (dB)	Min (dB)	Max (dB)	Min (dB)	Max (dB)	Min (dB)	Max (dB)
INSERTION LOSS	5 MHz	11.1	12.1	8.5	10.5	7	7.8	5.5	7.5	3.5	4.3	3	4
	50 MHz	11.1	12.1	8.6	10.6	7	7.8	5.5	7.5	3.5	4.3	3	4
	550 MHz	11.1	12.1	9.4	11.4	7	7.8	5.7	7.7	3.5	4.3	3.3	4.3
	870 MHz	11.1	12.1	9.9	11.9	7	7.8	5.9	7.9	3.5	4.3	3.4	4.4
	1002 MHz	11.1	12.1	10.1	12.1	7	7.8	5.9	7.9	3.5	4.3	3.5	4.5
	1218 MHz			10.5	12.5			6	8			3.6	4.6
FLATNESS	50-F_{max} MHz		< 1.0		< 0.6		< 1.0		< 0.5		< 1.0		< 0.5
RETURN LOSS	5-50 MHz	20		18		20		18		20		18	
	50-1002 MHz	20		20		20		20		20		20	
	1002-1218 MHz			18				18				18	

NOTE:
* = F or B (BNC) connectors.

Table #2: Plain Splitter/Combiner Module Specifications

SERVICE & SUPPORT

9. Service & Support

9.1. Contact ATX Networks

Please contact ATX Technical Support for assistance with any ATX products. Please contact ATX to obtain a valid RMA number for any ATX products that require service and are in or out-of-warranty before returning a failed module to ATX.

TECHNICAL SUPPORT

Tel: 289.204.7800 – press 1
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only
Email: support@atx.com

SALES ASSISTANCE

Tel: 289.204.7800 – press 2
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only
Email: insidesales@atx.com

FOR HELP WITH AN EXISTING ORDER

Tel: 289.204.7800 – press 3
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only
Email: orders@atx.com
Web: www.atx.com

9.2. Warranty Information

All of ATX Networks' products have a 1-year warranty that covers manufacturer's defects or failures.

9.3. Safety

IMPORTANT! FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

WATER AND MOISTURE: Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The device should be connected to a power supply only of the type described in the operating instructions or as marked on the device.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of the device is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the device.

SERVICING: The user should not attempt to service the device beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FUSING: If your device is equipped with a fused receptacle, replace only with the same type fuse. Refer to replacement text on the unit for correct fuse type.

ATX Networks

Tel: 289.204.7800 | Toll-Free: 866.YOUR.ATX (866.968.7289) | support@atx.com