JMA WIRELESS

Technical Education Catalog 2017

Private Training

Individual customers can arrange for private courses to be conducted on-site or at hosted locations.

Webinars & Online Learning

Webinars and online learning opportunities are regularly scheduled and can be taken at the student's convenience.

On-site In-Person Training

Instructor-led classroom courses are regularly scheduled and conducted globally in various regions along with customer-hosted locations.

Technical Education

Webinars and Classroom Training

JMA Wireless Technical Education Series offers instruction for people designing, installing, and commissioning the JMA Wireless TEKO DAS Platform, Transmission Line Systems, FUZE™ Platform and Antenna Systems. Learning opportunities include live, online instruction and instructor-led classroom courses.

Webinars			
Audience	**Basic**	**Advanced**	**PRO**
Installer	• TEKO DAS Platform • RET Antenna Training • FUZE Basic Training	• TEKO DAS Installation	
Operations	• TEKO DAS Platform • TEKO DAS Installation • OMC • RET Antenna Training		
RF engineer	• TEKO DAS Platform • TEKO DAS Installation • Public Safety		• TEKO DAS Commissioning Prerequisite course: *TEKO DAS Installation and Commissioning* • Uplink Performance
Design engineer	• TEKO DAS Platform • Public Safety • TEKO Components in iBwave		• Uplink Performance

Classroom Training			
Audience	**Basic**	**Advanced**	**PRO**
Installer	• Basic Connector • RET Antenna Training • FUZE Digital Electricity Installation	• Advanced Connector Prerequisite course: *Basic Connector*	• TEKO DAS Operations and Maintenance • TEKO DAS Installation and Commissioning
Operations	• Basic Connector • RET Antenna Training	• Advanced Connector Prerequisite course: *Basic Connector* • TEKO DAS Operations and Maintenance	• TEKO DAS Installation and Commissioning
RF engineer		• TEKO DAS Installation and Commissioning	
Design engineer		• Advanced Configuration and Architectural Design	• TEKO DAS in iBwave Prerequisite: *Requires a current iBwave level one (or higher) certification*

Basic Connector Training

Instructor-led, four-hour course

Overview

This four-hour, technical, connector-and-tool training includes a presentation of features and benefits, failure mode, instructor demonstration of proper techniques and hands-on tech cable and connector jumper completion to ensure the audience has the ability and confidence to complete connector installation successfully. Once you successfully complete the training, you will receive a certification card.

Target Audience

Technicians planning to install JMA Wireless compression connectors.

Requirements

To ensure optimum delivery, we require the following:

- Two sessions per training request. A session is four hours in duration, with no more than eight and no fewer than four attendees per session.
- Training starts on time and ends as scheduled.
- JMA Wireless tools purchased prior to scheduling training. Location, seating, and tables provided by the customer. Proper cables provided by the customer.

Objectives

After completing this course, the student will be able to:

- Install JMA Wireless connectors.
- Understand how to use and maintain JMA Wireless tools.
- Identify which connectors and tools are compatible with which cable types
- Understand the reasons for poor PIM and sweep test results.
- Reduce repeated trouble calls.
- Increase awareness of craftsmanship.

Agenda

- JMA Wireless presentation.
- Connector and tool demonstration.
- Connector and tool preparation performed by attendees.

Cancellation Policy

Reservations canceled within two weeks of the training date are subject to a $2,000 cancellation fee.

Advanced Connector Training

Instructor-led, four-hour course

Overview

This carrier-sponsored, four-hour, advanced technical training class covers JMA Wireless connectors and tools for those contractors who have previously attended the JMA Wireless Basic Training class. It provides the carrier with a better understanding of how their contractors install JMA Wireless connectors. Testing for passive intermodulation (PIM) and maintenance of JMA Wireless tools and PIM test equipment are taught in depth. The JMA Wireless class is taught in cooperation with a PIM-test-set vendor (either Kaelus or Anritsu). Kaelus and Anritsu both audit the contractor's PIM test equipment and review the importance of testing for PIM, and provide a refresher of what PIM is. Once the contractor successfully completes the training, they will receive an advanced certification card, and the carrier sponsoring the training will also receive course results for their records.

Requirements

To ensure optimum delivery, we require the following:

- Must be sponsored by a carrier or neutral host company.
- Each contractor attending must bring one set of JMA Wireless tools and one PIM test set.
- Individuals attending must have attended JMA Wireless Basic Training.
- Individuals attending must have installed JMA Wireless connectors for at least three months.
- Two sessions per training request, both of which are to start on time.
- Location, seating and tables provided by the carrier or neutral host company. Proper cables provided by the customer.

Objectives

After completing this course, the student will:

- Refresh their knowledge of the installation and testing of JMA Wireless connectors.
- Increase their understanding of how to properly maintain JMA Wireless tools and conduct a tool audit.
- Build three jumpers and pass two of three with PIM results -153 dB or better.
- Correctly answer 16 of 20 questions.

Agenda

- JMA Wireless tool audit
- Kaelus/Anritsu test set audit
- JMA Wireless presentation on new products
- Quick review of JMA Wireless connector installation
- Teams of two building three jumpers and passing two of three with a -153 dB or better
- JMA Wireless questioner hands out test. Participants correctly answer 16 of 20.

Cancellation Policy

Reservations canceled within two weeks of the training date are subject to a $2,000 cancellation fee.

RET Antenna Training

Instructor-led, two-hour course

Overview

This two-hour, carrier or neutral host company sponsored JMA Wireless Remote Electrical Tilt Workshop encourages discussion and continued learning of JMA Wireless RET products, AISG 2.0, and troubleshooting tips.

Requirements

To ensure optimum delivery, we require the following:

- One session per training request. A session is two hours in duration with no more than 10 and no fewer than eight technicians attending per session.
- Need to have read the JMA Wireless PCU-220 user guide and have our graphical user interface installed on your laptop before attending.
- Location, seating, power, and projector provided by the customer.
- Training starts on time and ends as scheduled.

Objectives

After completing this course, the student will be able to:

- Connect a JMA Wireless controller to a laptop.
- Configure a JMA Wireless RET motor.
- Troubleshoot RET issues.
- Understand AISG 2.0 and RET system diagrams.
- Increase awareness of JMA Wireless RET products.

Agenda

- JMA Wireless presentation of features, common RET configurations, troubleshooting review.
- Instructor demonstration on using the graphical user interface, hands-on tech software, controller, motor.
- RET AISG 2.0 review.
- Student hands-on RET operations from GUI to the motor.
- Questions and answers.

Cancellation Policy

Reservations canceled within two weeks of the training date are subject to a $2,000 cancellation fee.

JMA Wireless Public Safety

Webinar

Overview

This 1.5-hour interactive webinar provides an overview of the JMA Wireless Public Safety products, main features, and key benefits.

Target Audience

JMA Wireless partners, system integrators, DAS designers, technical staff, sales and marketing

Prerequisite

Basic knowledge of Radio Frequency (RF), Signal Boosters and Distributed Antenna Systems (DAS)

Objectives

After completing this course, the student will be able to:

- Differentiate between Distributed Antenna Systems (DAS) and Signal Boosters
- Identify the different types of signal boosters
- Describe the Public Safety product families
- Describe the Public Safety DAS architecture
- Explain filtering options
- List the key performance differentiators

Agenda

- Signal Booster Overview
- Adjustable Bandwidth signal Boosters
- Digital Signal Boosters
- Public Safety DAS
- NEMA4X External duplexer options
- NMS-FOMS
- Public safety solution cabinet
- Project Checklist

TEKO DAS Platform Overview

Webinar

Overview

This 1.5-hour interactive webinar provides those working with Distributed Antenna Systems with an overview on the JMA Wireless TEKO DAS product line components, main features, and key benefits. The webinar is a basic walk-through of the Radio Frequency (RF) end-to-end chain and TEKO DAS functions.

Target Audience

JMA Wireless partners, system integrators, DAS designers, technical staff, sales and marketing

Prerequisite

Basic knowledge of Radio Frequency (RF) and Distributed Antenna Systems (DAS)

Objectives

After completing this course, the student will be able to:

- Describe end-to-end TEKO DAS platform, from RF source to Remote Unit.
- Identify and describe the function of the DAS platform components.
- Define the system RF and optical input/output, fiber link budget and remote unit (RU) power classes.
- Select the appropriate point of interface (POI) for a given application.
- Describe the optical topologies that use standard OTRX, point-to-point link and DWDM modules.
- Describe the supervision, monitoring, and power options available.
- Identify the principal product advantages while adopting TEKO DAS.
- Explain the process to achieve TEKO DAS certification.

Agenda

- TEKO DAS product overview
- Master and remote unit specifications
- Point-to-point links and DWDM modules
- OMT and OMC
- Multiband Spectrum Analyzer (MSA)
- Digital Electricity™
- Principal product advantages

TEKO DAS Installation & Commissioning Certification

Instructor-led, two-day course

Overview

This hands-on technical certification course provides students with the experience required to install, commission and maintain the JMA Wireless TEKO DAS platform.

Target Audience

JMA Wireless customers and partner system integrators, installers, RF engineers, technicians, and operations personnel.

Prerequisite

All: Laptop computer

Commissioning: Working knowledge of RF and current air-link modulation schemes (3G/4G).
Experience using RF test equipment.

Objectives

After completing this course, the student will be able to:

- Explain the DAS installation steps.
- Install provided DAS equipment and verify proper operation.
- Identify the system RF input/output, fiber link budget, and power specifications.
- With a given installation and RF signaling, demonstrate ability to measure, calculate, and adjust the downlink (DL) and uplink (UL) gain settings.
- Perform system settings, changes, status, alarm verification, downloads and troubleshooting using the OMT on a given installation.
- List and demonstrate the steps required to commission a given DAS.

Agenda

Session 1: Product overview

Session 2: Installation

Session 3: Operation maintenance terminal

Session 4: RF commissioning

Session 5: Testing, troubleshooting, and maintenance

TEKO DAS Operation and Maintenance

Instructor-led, one day course

Overview

This 1 day hands-on technical course covers the TEKO DAS Operation and Maintenance Terminal, basic troubleshooting and operational best practices to provide students with the experience necessary to maintain and troubleshoot the JMA Wireless TEKO DAS platform.

Target Audience

JMA Partners, System Integrators, RF Engineers, Technicians and Operations personnel.

Prerequisite

Laptop computer, Working knowledge of RF and current air-link modulation schemes (3G/4G).

Experience using RF and optical test equipment.

Objectives

After completing this course, the successful student will be able to:

- Identify the system RF input/output, fiber link budget, and power specifications.
- With a given installation and RF signaling, demonstrate ability to identify faults and conducted corrective actions.
- Perform system settings, changes, status, alarm verification, downloads and troubleshooting using the OMT on a given installation.
- List the steps required to commission a given DAS.
- Pass Assessment

Agenda

- TEKO DAS System overview
- Basic DAS Installation and best practices
- Operation maintenance terminal
- Testing, troubleshooting, and maintenance
- RF commissioning Overview
- Assessment

TEKO DAS Certified Commissioning Review

Webinar

Overview

This 1 ½ hour interactive webinar provides information helpful to RF engineers who are tasked with commissioning the TEKO DAS platform. A review of the commissioning steps, tools, and required test equipment will be presented, along with a question and answer period.

Target Audience

JMA wireless partners, System Integrators, RF Engineers or those who are currently certified in TEKO DAS Installation and Commissioning.

Prerequisite

Successfully completed the TEKO DAS Installation and Commissioning certification course and holding a current certification.

Objectives

After completing this course, the student will be able to:

- Describe end-to-end JMA DAS platform, from RF source to Remote Unit
- Identify and describe the function of the DAS platform components
- List the steps required to commission the TEKO DAS.
- Identify the necessary commissioning tools and describe their functions.

Agenda

- DAS RF block diagram end-to-end overview
- TEKO DAS platform components
- RF and optical input/output, fiber link budget, and remote unit power classes
- Commissioning tools
- RF Commissioning process and steps
- Questions and answers

TEKO DAS Basic Installation
Webinar

Overview

This 2-hour technical webinar provides students with the information necessary to install the TEKO DAS Master Unit and Remote units. Topics covered include installation best practices, accessing the operation and maintenance terminal (OMT) and performing green light testing.

Target Audience

JMA Partners, System Integrators, Technicians, Operations personnel and Installers.

Prerequisite

Basic knowledge of AC and DC electrical circuits, grounding, antenna and electronic equipment installation.

Objectives

After completing this webinar, the student will be able to:

- Identify the Master Unit and Remote unit Components RF interfacing
- List the system optical input/output, fiber link budget and electrical specifications
- Describe the standard optical topologies
- List the required tools and installation best practices
- Explain how to log into the OMT and perform green light testing

Agenda

- DAS RF block diagram end-to-end overview
- Master Unit components, Installation and best practices
- Remote Unit components, installation and best practices
- Optical Topology and link budgets
- Operation and Maintenance Terminal (OMT)
- Green Light Testing
- Installation tools and equipment
- Assessment

TEKO DAS Components in iBwave

Webinar

Overview

This 1.5-hour interactive webinar provides students with the information necessary to identify the TEKO DAS equipment, install vex files, configure master unit components and utilization of the automatic and manual power sharing while designing active DAS within the iBwave environment.

Target Audience

JMA Wireless partners, system integrators, DAS designers, technical staff, sales and marketing.

Prerequisite

Good working knowledge of iBwave software. Basic knowledge of radio frequency (RF) and distributed antenna systems (DAS).

Objectives

After completing this webinar, the student will be able to:

- Identify TEKO DAS components in iBwave Parts menu list.
- Describe main features of TEKO DAS components in iBwave.
- Position TEKO DAS equipment in the rack at master unit side.
- Perform iBwave commissioning with both automatic and manual power sharing.
- Illustrate how to import TEKO DAS VEX files.

Agenda

- Find TEKO components in iBwave
- TEKO remote units
- Building a TEKO master unit
- Power sharing: automatic vs. manual
- TEKO VEX files

TEKO DAS in iBwave Certification

Instructor-led, two-day course

Overview

JMA Wireless TEKO DAS in iBwave is an instructor-led, hands-on, two-day certification course. The purpose of this course is to enable iBwave users to proficiently design JMA Wireless TEKO DAS solutions using provided vex and template files. Attendees will gain the experience to effectively design TEKO DAS systems.

Target Audience

JMA Wireless partners and customers, RF engineers and radio planners designing with the JMA Wireless TEKO platform in iBwave.

Prerequisite

Current iBwave Level 1 certification or higher, attended JMA Wireless TEKO DAS Platform Webinar or I&C course, laptop with the following minimum specifications: 2.0 GHz processor, Windows 7, 8 or 10 OS, 500 MB hard disk, 1024 x 768 resolution, 24-bit monitor.

Objectives

After completing this course, the student will be able to:

- Describe the TEKO DAS platform product specifications and end-to-end architecture.
- Locate and import JMA Wireless TEKO vex file.
- Define the necessary design parameters.
- Obtain the correct output power from the amplifier.
- Demonstrate the ability to use automatic and manual power sharing.
- Recognize where to adjust system gains.
- Identify, select, and assemble JMA Wireless TEKO components in iBwave (das, connectors, antennas) based on given design parameters
- Construct rack elevation drawings following JMA Wireless TEKO best practices
- Generate BOM

Agenda

Session 1: Product overview

Session 2: Locate and Import JMA TEKO vex file

Session 3: Define the design parameters

Session 4: Identify, select, and assemble JMA TEKO components

Session 5: Automatic and manual power sharing/system gains

Session 6: Generate BOM

Session 7: Assessment

TEKO DAS Advanced Configuration and Architectural Design Certification

Instructor-led

Overview

This 2 day hands on instructor led course will enable experienced RF/Radio planners and designers to effectively select the correct product(s), determine power supply requirements and assemble accurate bill of materials optimized for given applications.

Target Audience

JMA Partners, System Integrators, DAS designers and Radio planners who have experience designing indoor and outdoor Distributed Antenna Systems.

Prerequisite

Working knowledge of RF and Radio planning applications, techniques and tools. Laptop computer. Attend either TEKO DAS Product Webinar or TEKO DAS Installation and Commissioning course.

Objectives

After completing this course, the student will be able to:

- Identify the major components that comprise the TEKO DAS platform
- Select the appropriate Point of Interface for a given application
- Select the appropriate Remote Unit(s) for a given application
- Determine the type of Optical Transceiver (OTRX) needed for a given scenario
- Identify the most effective passive chain between POI and OTRX
- Describe use of the 7 band on one layer and Software Defined Remote Unit (SDRU) applications
- Explain how to implement Point to Point link with WDM or DWDM
- Calculate power requirements and create an accurate Bill of Material
- Assemble the needed number of basic building blocks components

Agenda

- TEKO DAS product overview
- Point of Interfaces (POI)
- Between POI and OTRX: the most effective passive chain in the Master Unit
- OTRX options and selection based on the given scenario
- Sub rack, Supervision and Power calculations
- Remote Units
- Fiber architectures
- Special applications
- Product selection and Bill of material

JMA Wireless Uplink Performances Overview

Webinar

Overview

This 1 ½ hour interactive webinar provides those working with Distributed Antenna Systems with an overview on uplink considerations. The webinar is a deep walk-through on how uplink dimensioning affects system's performances and how TEKO DAS product line components can optimize uplink capacity. .

Target Audience

JMA Partners, System Integrators, RF Engineers, DAS designers.

Prerequisite

Deep knowledge of Radio Frequency (RF) and Distributed Antenna Systems (DAS).

Objectives

After completing this course, the successful student will be able to:

- Identify the main elements of the link budget in uplink
- Describe how coverage area can be divided into different data-rate categories
- Explain the impact of Noise Figure, Uplink system gain and Uplink passive insertion loss on uplink performances
- Describe the effect on uplink performances using a D-RAN approach vs. an active DAS one
- Describe how TEKO DAS system can increase uplink data-rate
- Explain how the different Remote Unit power classes affect the uplink
- Select the appropriate Remote Unit power class to meet the highest possible uplink data-rate
- Distinguish between downlink and uplink limited systems

Agenda

- Typical DAS design approach: downlink only
- Uplink link budget elements
- Uplink cell radius
- Uplink Key Performance Indicator (KPI) specifications
- Solutions Comparison
- Active DAS advantages in Uplink performances

FUZE Digital Electricity™ Installation & Maintenance

Instructor-led, two-hour course

Overview

This 2-hour interactive FUZE Digital Electricity™ training session will improve installation and maintenance techniques when operating the JMA Wireless FUZE Digital Electricity™ system components.

Target Audience

JMA Wireless contractors that are installing and maintaining FUZE Digital Electricity™ systems.

Prerequisite

Attendees must have purchased a JMA Wireless FUZE Digital Electricity™ system or be planning to complete work for a JMA Wireless customer who has purchased. Each session is 2-hours in duration and requires no more than 10 and no less than 8 technicians attending per session. Location, seating, tables provided by the customer.

Objectives

After completing this training, the student will be able to:

- Increase awareness of FUZE Digital Electricity™ system
- Become educated on how to receive support when installing the system
- Complete typical installation maintenance and commissioning practices
- Earn FUZE Digital Electricity™ certification card upon completion

Agenda

- FUZE Digital Electricity™ presentation of features/benefits failure modes
- Instructor demonstration of proper techniques and hands-on support
- Review typical installation maintenance and commissioning practices

Additional Course Information

Customizable & flexible on-site or online training

Training Locations

Instructor-led classroom courses are regularly scheduled and conducted globally in various regions along with customer-hosted locations.

Private Training

Individual customers may request private courses to be conducted on-site or at hosted locations.
Minimum of six students required.

Online Learning

Webinars and online learning opportunities are regularly scheduled and can be taken at the student's convenience.

Contact Us:

technicaleducation@jmawireless.com

info.jmawireless.com/support/technical-education

JMA Wireless TEKO RF Repeater Installation and Commissioning Certification

Instructor-led, one-day course, international market only (not offered in North America)

Overview

This hands-on technical course provides students with the experience to install, commission, and maintain the JMA Wireless TEKO RF Repeaters.

Target Audience

JMA Wireless partners and system integrator installers, RF engineers, technicians and operations personnel.

Prerequisite

All: Laptop computer

Commissioning: Working knowledge of RF and current air-link modulation schemes (2G/3G/4G). Familiarity and use of RF test equipment. Knowledge of TEKO DAS platform; participation in JMA Wireless TEKO DAS Platform Overview required.

Objectives

After completing this course, the student will be able to:

- Identify the different RF repeaters configurations.
- Determine the minimum input power required for a given installation scenario.
- Install provided RF repeaters and verify proper operations.
- Describe different possibilities in terms of donor antennas and service antennas or leaky cable.
- Identify the system RF input/output, fiber link budget and power specifications.
- With a given installation and RF signaling, demonstrate ability to measure, calculate, and adjust the downlink and uplink gain settings.
- Perform system settings, changes, status, alarm verification, downloads and troubleshooting using the OMT on a given installation.
- List and demonstrate the steps required to commission a given RF repeater.
- Pass assessment.

Agenda

Session 1: Product overview

Session 2: Installation

Session 3: Operation maintenance terminal

Session 4: RF commissioning

Session 5: Testing, troubleshooting and maintenance

Supervision and Monitoring of TEKO DAS Platform: OMT and OMC

Instructor-led, one-day course

Overview

This hands-on technical course provides students with the experience to monitor the TEKO DAS platform by accessing both the Operation Maintenance Terminal (OMT) and Operation Maintenance Center (OMC) through the Supervision module (SPV).

Target Audience

JMA Wireless partners and system integrator installers, RF engineers, technicians, and operations personnel.

Prerequisite

All: Laptop computer. Knowledge of TEKO DAS platform; participation in JMA Wireless TEKO DAS Platform Overview required.

Objectives

After completing this course, the student will be able to:

- Describe the main features of both OMT and OMC.
- Compare OMT and OMC, and explain which is best for each situation.
- Demonstrate how to access the SPV with both OMT and OMC.
- Illustrate how the SPV can send notifications.
- Conduct the discovery process through OMT.
- List all possible options to interface the SPV to external monitoring systems.
- Connect the OMC client to the OMC server.
- Identify the functions related to all windows and buttons in the OMC GUI.
- Use the smart and alarm browser in the OMC.
- Explain how to troubleshoot a TEKO DAS system through both OMT and OMC.

Agenda

Session 1: OMT overview

Session 2: OMC overview

Session 3: Alarms propagation from SPV to OMT and OMC

Session 4: Troubleshooting