INDUSTRIAL ETHERNET SWITCHES
- Gigabit and 100 Mbps
- Managed and unmanaged
- DIN mounted switches - 5, 6, 10, 12, 16 and 20 ports
- 19" rack mounted – 24, 26 ports

INDUSTRIAL POE SWITCHES
- Gigabit and 100 Mbps
- Managed and unmanaged
- DIN mounted – 2, 3, 5, 6, 10, 12 ports
- 19" rack mounted – 10, 26 ports

ETHERNET MEDIA CONVERTERS
- Gigabit and 100 Mbps
- Managed and unmanaged
- Industrial
- PoE

SERIAL CONNECTIVITY
- RS-232/422/485/ Serial Device Server
- 1, 2, 4, 8, 16 ports
- RS-232 to RS485422/ Converter
- Isolation Protector
- USB to RS-232422/485/ Converter
- Surge Protector

CAN-BUS CONNECTIVITY
- CAN Bus to RS-232 Converter
- CAN Bus to Ethernet Converter
- CAN Bus to Fiber Converter

FIELDBUS GATEWAYS
- RS-232422/485/ to Modbus Gateway
- 1, 2, 4, 8 ports

VIDEO OPTICAL TRANSCEIVERS
- Video to Fiber Converters
- 1, 2, 4, 8 16 channels
- TVI/CVI/AHD to Fiber
INDUSTRIAL COMPUTERS

Embedded Automation PC
- Optimized UNO
- Universal UNO
- Customized UNO

Control Cabinet PC
- DIN-Rail Mount
- Wall Mount
- Book Mount
- Enclosure Mount

INTELLIGENT HEALTHCARE

INTELLIGENT LOGISTICS

INTELLIGENT RETAIL

INDUSTRIAL ETHERNET SWITCHES
- Unmanaged Ethernet Switches
- Managed Ethernet Switches
- Industrial PoE Switches
- Industrial Protocol Switch
- EN50155 Ethernet Switches
- IEC618503- Ethernet Switches

FIBER & PoE MEDIA CONVERTERS, EXTENDERS
- Intelligent Modular Media Converters
- Miniature Media Converters
- Intelligent Media Converters
- Industrial Media Converters
- PoE/PoE+ Media Converters
- VDSL Extenders
- PoE Injectors, Splitters and Extenders

CELLULAR ROUTERS
- 4G LTE Routers
- 3G UMTS/HSPA+ Router
- Intelligent Gateways

IoT AND NETWORK EDGE PLATFORMS
- Wzzard LoRaWAN node with power monitoring
- Wzzard LoRaWAN Gateway
- Wzzard Smart Mesh Sensing Network

SERIAL, USB CONNECTIVITY

REMOTE I/O
NETWORK CABINETS
- GT GlobalFrame Cabinet
- 42U, 45U - 600, 800 mm widths
- 800 to 1200 mm depths

SERVER & NETWORK CABINETS
- TeraFrame Cabinet
- GlobalFrame Cabinet
- 42U to 52U - 600, 800 mm widths
- 800 to 1200 mm depths

WALL-MOUNT SYSTEMS
- Wall-Mount Open Systems
- Wall-Mount Enclosed Systems

OPEN FRAME RACK SYSTEMS
- Two-Post / Four-PoSt Racks
- Seismic Protection Systems

CABLE MANAGEMENT
- Vertical Cable Management
- Horizontal cable Management

CABLE RUNWAY AND TRAY
- Cable Runway
- Wire Mesh Cable Tray

AISLE CONTAINMENT
- Cold Aisle Containment
- Hot Aisle Containment

POWER MANAGEMENT
- eConnect PDUs
- Power Strips
- Power IQ for eConnect

ENVIRONMENT MONITORING SYSTEMS
- RIM-Wired Monitoring
- Electronic Locking Systems

RMR INDUSTRIAL ENCLOSURES
- RMR Free-Standing Enclosure
- RMR Modular Enclosure
- RMR Wall Mount
- NEMA Type 4, 12 / IP55, 66
- Adaptable to NEMA Type 1, 2, 3, 3R and 5
CABLE CERTIFICATION SYSTEM AND MANAGEMENT

- Versiv™ Cable Certification System

COPPER CABLE TEST SOLUTIONS

- DSX2-8000 CableAnalyzer™
- DSX2-5000 CableAnalyzer™
- Copper Adapter and Accessories
- CableIQ™ Qualification Tester
- MicroMapper™
- MicroScanner PoE
- MicroScanner 2 Cable Verifier
- IntelliTone™ Pro 200 LAN Toner and Probe
- Pro3000™ Analog Tone and Probe
- Pocket Toner®
- TS® 100 PRO Cable Fault Finder
- TS® 90/TS® 100 Cable Fault Finder
- LinkWare™ Live

FIBER CABLE TEST SOLUTIONS

- OptiFiber® Pro OTDR
- OptiFiber® Pro HDR OTDR
- CertiFiber® Pro
- FI-7000 FiberInspector™ Pro
- MultiFiber® Pro
- SimpliFiber Pro® Optical Power Meter
- Fiber Test Kits
- Fiber QuickMap™
- Fiber OneShot™ PRO

FIBER INSPECTION AND CLEANING

- FiberInspector™ Mini Video Microscope
- FI-3000 FiberInspector™ Pro MPO Inspection Camera
- FiberViewer™ Fiber Microscope
- VisiFault™ Visual Fault Locator
- Fiber Optic Cleaning Kits

TOOLS AND TEST KITS

TELEPHONE BUTT-SETS AND ACCESS NETWORK TEST

GOLD SUPPORT
INTERACTIVE LCD DISPLAY

LCD DIGITAL SIGNAGE
- General Indoor Series
- Stretched Series

LED DISPLAY
- Indoor Fixed
- Outdoor Fixed
- Indoor Rental
- Outdoor Rental
- Traffic Guidance
- Stadium
- Commercial

CONTROL
- Matrix
- Keyboard
- Decoders
- KVM

WEATHERPROOF ENCLOSURE PRODUCTS
- FRP Industrial Enclosure
- NEMA Type 4, 4X / IP66 Rated
- Mounting Rails for DIN3 Rails and DIN Modules in the Enclosure
- Wall / Pole Mounting
- Indoor and Outdoor Installations
- Corrosive Environments & Hotspot Applications

SURGE PROTECTORS, LIGHTNING ARRESTORS
- Cat55/e/66/A,PoE Camera Lightning Protectors
- Cat55/e/6 Protectors/PoE Injectors
- RS422/RS485 Protectors

ETHERNET CABLES, CONNECTORS
- Cable Assemblies
- Industrial Harsh Environment IP67 Plugs, Connectors
- Right Angle Ethernet Cable Assemblies
Copper Solutions
- Copper Systems
  - Atlas-X1: category 5e, 6, 6A, 8
  - eXtreme: category 5e, 6, 6A
  - Plus: category 5e, 6, 6A
- Category-rated connectors
- Patch Panels
- Cross Connect
- Patch Cords
- Pre-Terminated Trunks
- Copper cables
- Copper tools & labeling

Fiber Solutions
- Fiber systems
  - HDX Systems
  - SDX Systems
  - e2XHD Systems
  - FiberPlus Systems
- Opt-X rack mount enclosures
- Wall mount enclosures
- Patch cords, pigtails
- Pre-terminated cable assemblies
- Optical cables
- Air-blown fiber systems
- Connectors & housings
- Tools & consumables

AV Solutions
- IT/AV System
- HDMI extenders - HDBaseT
- USB extenders
- AV connectors & adapters

Housings & Wallplates
- QuickPort Surface-Mount & DIN Rail-Mount Boxes
- QuickPort Wallplates
- DuraPort Industrial Connectivity
- Multimedia Outlet System (MOS)

Cable Management
- Versi-Duct Cable Management System
- Horizontal Cable Managers
- Rear Cable Managers
- VELCRO Brand Fasteners
- Zone Enclosures

Smart Patch Intelligent Infrastructure Management Solutions
MICROSENS GmbH & Co. KG, Küferstr 16, 59067 Hamm, Germany

FTTO OPTICAL LAN
- GbE Micro Switches PoE+ Generation 6
- Fast Ethernet Switches
- Horizontal and Vertical
- Multiple Redundancy options
- Power Supplies, Installation Accessories
- Management Software

INDUSTRIAL ETHERNET SWITCHES
Profiline Switches DIN Mounted
- PLM GbE 13 Port Base Switch
- PLM GbE 6 / 12 Port Expansion Modules
- Profiline + GbE 7 Port Switch

Ruggedized Micro Switch
- 6-port GBE Switch, PoE/PoE+. DIN Mounted

Profiline 19" Rack Mounted
- 25-port Gigabit w/ 8x Dual Media

RACK MOUNTED / DESKTOP SWITCHES
- 24-port Gigabit Ethernet SFP Switch
- 48-port Gigabit Ethernet SFP Switch, L2/L# MPLS
- Desktop Gigabit Switches – 5 / 6 / 10 ports

PoE EXTENDERS / SPLITTERS
- Stand alone
- Rack mounting midspan
- Industrial injectors / splitters

CONVERTERS / BRIDGES
- Singleport, Multiport converters
- 10G Ethernet Converter 10GBase-T / SFP+ 10GBase-X
- Modular converters
- Industrial converters

PLUGGABLE TRANSCEIVERS
- SFP, SFP+, XFP
- XWDP SFP

OPTICAL TRANSPORT
- 100G Muxponder / Transponder
- TDM Multiplexer

SMART LIGHTING CONTROLLER
- IP-based LED Lighting Controller
- Smart Office App
NETWORK CABINETS
- Floor Standing Cabinets
- 18, 22, 27, 32, 37, 42, 47 U
- 600, 800 mm Widths
- 600, 800 mm Depths
- Glass Door, Plain Steel Door, Vented Doors
- Single, Double Doors
- With Accessories
- Vertical Cable Manager
- Castor, Shelves, Fans, Cage Nuts

SERVER CABINETS
- Floor Standing Cabinets
- 27, 42, 47 U
- 800 mm Widths
- 1000, 1200 mm Depths
- Vented Doors In Front And Rear
- Single, Double Doors
- With Accessories
- Vertical Cable Manager
- Castor, Shelves, Fans, Cage Nuts

WALLMOUNT CABINETS
- Single Section, Double Section
- 4, 6, 9, 12, 15, 18, 22, 27 U
- Glass Door, Plain Steel Door
- 550, 600 mm Widths
- 400, 450, 500, 550, 600 mm Depths

CABLE MANAGEMENT
- Vertical Cable Manager in 800 mm Wide Cabinets
- Horizontal Cable Management
- Metal, Plastic 1U Cable Management
- Rings, Slotted With Cover

POWER DISTRIBUTION
- 6, 8, 10 way PDU
- Horizontal, Vertical PDU
ENVIRONMENT MONITORING

- Enterprise Environment Monitoring Systems
- Small, Medium, Large EMS
- Management Software for Enterprise EMS
- Power Monitoring and Power Control Devices
- Environmental Sensors
- Alerts & Communication Accessories

VIDEO MULTIVIEWERS

- 4K HDMI Quadscreen Multiviewer
- 4K HDMI Quadscreen Splitter / Multiviewer
- HDMI Quadscreen Multiviewer with KVM Switch
- 4x4 HDMI Multiviewer / Video Matrix Switch / Video Wall Processor

EXTENDERS

Point-to-Point Extenders

- KVM Extenders
- Video / Audio Extenders
- HDMI Extenders: CATx, Fiber, Coax, IP, Wireless
- USB, Firewire & RS232 Extenders
- Audio Extenders

Point to Multi-Point Extenders

- KVM Splitters / Extenders
- Video / Audio Splitters / Extenders

VIDEO MATRIX SWITCHES

VIDEO WALLS

- Multi-Format HD Video Wall Controller
- 4x4 HDMI Multiviewer / Video Matrix Switch / Video Wall Processor
- 4K HDMI USB KVM Extender Over IP Video Wall Support

KVM DRAWERS

KVM SWITCHES

VIDEO SPLITTERS

VIDEO CONVERTERS

KVM Splitters

CONSOLE SWITCHES

VPI POE EXTENDERS

- Waterproof IP66
- IEEE802.3af, IEEE802.3at
- Gigabit 10/100/1000
ETHERNET MEDIA CONVERTER
- iConverter Managed Multi-Service Platform
- FlexPoint Unmanaged Media Converters
- miConverter PoE Media Converters

SERIAL MEDIA CONVERTERS
- Managed RS-232, RS422 / 485 to Fiber Media Converter
- X.21 Serial to Fiber Media Converter

ETHERNET F.O. SWITCHES
- RuggedNet Industrial PoE Switches
- Ethernet Switch Modules
- 10G Ethernet Switches

PLUGGABLE FIBER TRANSCEIVERS
- SFP, SFP+ and XFP
- CWDM SFP, WDM SFP+ and XFP

POE EXTENDER
- Indoor and outdoor
- 30W and 60W Gigabit PoE Extender with Booster Technology
- Up to 800 m

TDM and SONET
- Multiplexes T1 / E1
- T1 / E1 Copper-to-Fiber Media Converters
- T3 (DS3) or E3 Coax to Fiber Media Converter
- SM to MM Fiber Converters for OC-3 and STM-1
- OC-12 MM to SM Fiber Converter

CARRIER ETHERNET DEMARCATION
- 10 Gigabit and 1000 Mbps Carrier Ethernet Aggregation NID
- 1000 Mbps and 100 Mbps Carrier Ethernet Fiber Access NID

CWDM & DWDM MULTIPLEXERS
- iConverter® Optical CWDM Multiplexers
- OmniLight® LGX CWDM / DWDM Multiplexers
- 1 and 2 Channel Optical Add / Drop Multiplexer
- MUX / DEMUX and Optical Add / Drop Mux Modules
- LGX Dual Fiber DWDM MUX / DEMUX Modules

MANAGEMENT SOFTWARE
- iConverter Multi-Service Platform
- NetOutlook SNMP network Management Software
- NetOutlook Element Management System
ETHERNET EXTENDERS
- Managed Ethernet Extender
- Ultra-High-Speed Copper Ethernet Extender
- Ruggedized Multi-Drop Ethernet Extender
- PoE Ethernet Extender
- Ethernet-over-T1 / E1 Extenders

NETWORK EXTENDERS
- T1 and E1 Network Extenders
- Serial (RS-232, X.21, V.35) Network Extenders
- USB Extender

POE PRODUCTS
- IP67 / NEMA4x PoE Ethernet Extender
- Industrial Grade PoE Ethernet Extender
- Ethernet Booster
- Ethernet & PoE Surge Protectors

ROUTERS
- VPN Router
- Dual WAN Router
- WAN Router
- Bonding Router

FIBER SERIAL DATACOM
- Low Speed RS-232 - Fiber Optic Isolator / Converter / Modem
- High Speed RS-422/530 - Fiber Optic Isolator / Converter / Modem
- Low Speed RS-422/530 - Fiber Optic Isolator / Converter / Modem
- High Speed Async. / Sync TIA-RS-232, 530, 574, V.35, X.21

SECURITY FIBER COMMUNICATIONS
- G.703 E1/E2 Toolless IDC G.703/G.704 Balun
- High Speed (34 Mbps) G.703 Balun
- High Density G.703 Balun Panel, Rack Mount
- Passive CCTV Baluns
POWER DISTRIBUTION

- PX Intelligent Rack PDUs
- Color PDUs, SecureLock Cables
- C13, C19 Sockets, IEC 60309 Plug
- 16A, 32A and 63A Inputs
- Unit Level Metered PDU
- Outlet Level Metered PDU
- Outlet Level Metered and Switched PDU
- Single-Phase and Three-Phase Power
- Zero U, 1U, 2U and 3U Form Factors
- Environmental Sensors

PX Ethernet Metered Rack PDUs

- Metering at Inlet or PDU Circuit Breaker Level
- C13, C19 Sockets, IEC 60309 Plug

Inline Meters

Intelligent Hybrid Rack Transfer Switch

- Load Transfers within 4 to 8ms
- Inlet, Outlet and Branch Circuit Level Metering
- Remote Outlet Switching
- C13, C19 Sockets, C20, IEC 60309 Plug

DCIM - POWER MANAGEMENT

- Data Center Power Monitoring Software
- Date Center Energy Management

ENVIRONMENTAL MONITORING

- EMX Rack Controllers
- Temperature, Temp / Humidity Sensors
- Airflow, Air Pressure Sensors
- Water / Leak Sensors, Contact Clousure
- Vibration, Proximity Sensors

KVM SWITCHES

- KVM-over-IP Switches
- KVM-over-IP and Serial Console Server
- Centralized Access and Management
- Analog KVM Switches

KVM DRAWERS

SERIAL CONSOLES
NETWORK CABINETS
- VARISTAR - 24U, 29U, 42U, 47U
- Widths 600/800, Depths 800/1000/1200
- Doors: Plain, Glass, Perforated, Single, Double
- Colors: 21 Different RAL Shades

OPEN FRAME RACKS
- 2-Post, 4-Post - 24U, 29U, 42U, 47U
- Vertical Cable Management

WALL MOUNTED CABINETS
- Epcase 19” - 9U, 12U, 16U, 20U
- Widths 600, Depths 300/400/500/600

SERVER CABINETS
- VARISTAR - 24U, 29U, 42U and 47U
- Widths 600/800, Depths 800/1000/1200
- Doors: Plain, Glass, Perforated, Single, Double
- IP 20, IP 55, EMC, Seismic, Water Cooled
- Upto 1600 kg Load Rating

COLOCATION CABINET
- 2, 3 or 4 Divider Units
- Multi-Point Door Locking
- Seperate Access to Power and Cabling

CONTAINMENT SYSTEM
- Cold Aisle or Hot Aisle
- Aisle Width 800, 1000 mm, 1200 mm
- Aisle Doors: Swing, Manual Sliding, Automatic Sliding

IN-ROW AND IN RACK COOLING
- In-Rack Air/Water Heat Exchanger: 20 or 40 KW
- In-Row Heat Exchanger upto 30kw

POWER DISTRIBUTION & REMOTE MONITORING

OUT OOR CABINETS
- Unibody
- Unibody VENT
- Unibody HEX
- Modular VENT
- Modular HEX
Siqura B.V. 2801 DD Gouda, The Netherlands

**CCTV CAMERAS**
- Box Cameras
- Bullet Cameras
- Fixed Dome Cameras
- SD PTZ Dome Cameras
- HD PTZ Dome Cameras
- Prezzurized Dome Cameras
- IP / Analogue
- Explosion Proof Cameras
- Day / Night Cameras
- Cameras with WDR
- Indoor Cameras
- Outdoor Cameras
- Traffic Cameras
- Thermal Cameras

**VIDEO OVER FIBER**
- Analogue - Single Channel
- Digital - 1/4/8/ ch
- Data & Audio
- Accessories

**NETWORK EQUIPMENT**
- Unmanaged Switches
- Managed Switches
- Media Converters

**MIGRATION TO IP VDG SENSE VMS**
- Sense Basic License
- Sense Pro License
- Sense Failover License

---

**TKH Security, 2801 DD Gouda, The Netherlands**

**SOFTWARE PRODUCTS**
- iProtect Access
- iProtect Security

**HARDWARE PRODUCTS**
- Pluto Network Controller
- Orion Smart Door Controller
- Apollo Smart Rack Controller
- Sirius Card Reader
- Biometric Fingerprint Reader
- Accessories

---

**Access Control System**
www.keyprocessor.com

**TOPNET**
DCIM MONITORING SOFTWARE
PowerIQ®

- Data Center and Facility Energy, Power, and Environment Monitoring
- Power Control with Outlet Grouping
- Health Monitoring
- Health Tiles Dashboard for Multiple Sites
- Power Usage Effectiveness (PUE)
- Electronic Access Security Management
- Monitoring and Management
- Power and Environmental Data Aggregation
- Vendor Agnostic Support

DCIM OPERATIONS SOFTWARE
dcTrack®

- Management of Data Center Assets, capacity, and Changes
- Color-Coded Enterprise Health Dashboard
- Global 3D Floor Map Search
- 3D Visualization of Cabinets and Rows
- Stranded Power Capacity Dashboard
- Capacity Management Dashboard
- Thermal/Pressure Map Time-Lapse Video
- Port-to-Port Power and Network Visualization
- 3D Network Connectivity and Power Cabling
- Blade and Chassis Asset Management
PREMISE CABLE
- Fiber Cables
- Category 5e, 6, 6A Cables
- Category 3 Multipair Cables
- Coaxial cables

OSP CABLE
- OSP Fiber
- RDUP/RUS OSP Copper

ENDURAGAIN OSP
- EnduraGain OSP Unshielded – 5e, 6
- EnduraGain OSP Shielded – 5e, 6, 6A
- EnduraGain OSP Armoured – 5e, 6, 6A

PREMISES FIBER
- Interconnect Tight Buffer
- Breakout Tight Buffer
- Distribution Tight Buffer
- Interconnect Ribbon
- Interconnect Loose Tube
- Breakout Loose Tube

OSP FIBER
- Stranded Loose Tube (LT)
- Stranded Loose Tube (LT) Self Support
- Ribbon
- FTTP
- Single Loose Tube (LT)
- Composite
- Tight Buffer

COAXIAL CABLES
- Coax RG-6, RG-59, Interlock Armored Cables

FIRE ALARM AND SECURITY CONTROL CABLES
- Fire Alarm Non-Shielded/Shielded
- Interlock Armored Cables
- Security Control Non-Shielded Cables

UNV
Zhejiang Uniview Technologies, Binjiang District, Hangzhou, Zhejiang, China

NETWORK CAMERAS
- Box Cameras - 8 and 2 Megapixels
- Bullet Cameras - 8, 5, 4 and 2 Megapixels
- Dome Cameras - 8, 3, and 2 Megapixels

TECHNOLOGIES
- PixelSense Technology
- Ultra265 & U-code 2.0

NETWORK VIDEO RECORDERS & NETWORK STORAGE
- NVR - 16, 8, 4, 2 and 1 SATA
- Storage - IP SAN, Disk Enclosure

TRANSMISSION, DISPLAY & CONTROL
- Keyboard
- Encoder, Decoder
- Monitor
- Switch

VMS
- Unicorn

IP Video Surveillance Solutions
http://en.uniview.com
KOLDLOK RAISED FLOOR GROMMET

- SplitLok™ Integral Raised Floor Grommet
- SplitLok™ Square Raised Floor Grommet
- Integral Raised Floor Grommet
- Mini Grommet
- Surface Mount Original Grommet
- Surface Mount Large Grommet
- Round Grommet
- 2-Post Rack Grommet

HOTLOK BLANKING PANEL

- Black Blanking Panel - 1U, 2U
- White Blanking Panel - 1U, 2U
- Blanking Panel with Temperature Strip - 1U, 2U
- SwitchFix Passive Airflow System
- Pass-Through Blanking Panel - 2U
- Rack Airflow Management (RAM) Air Dam Kit
- Full Rack Blaning Kit - 42U
- Temperature Strip

AISLELOK MODULAR CONTAINMENT

- Cold Aisle and Hot Aisle Containment
- Rack Top Angle Baffle
- Rack Top Vertical Baffle
- Adjustable Mounting Post
- Adjustable Rack Gap Panel
- Sliding Doors
- Bi-Directional Doors
- Under Rack Panels
- Acrysell Sealing Tape
REFERENCE PROJECTS

- Dubai International Airport
  FTTx, Media Converters, Test Equip

- Dubai Islamic Bank
  IP KVM Switches

- Dubai Parks & Resorts
  IT & Outdoor Telecom Cabinets

- Emaar Properties - Dubai
  EMS and Industrial Switches

- Emirates
  Emirates Data Center - UAE
  Rack Intelligent Power Distribution Units

- Emirates Identity Authority - UAE
  DC Airflow Management

- Emirates NBD
  Emirates NBD Bank - Dubai
  Cat6A Cabling

- Exxon Mobil - Qatar
  Cat6 Cabling

- Fujairah City Centre - UAE
  Industrial Switches

- GHQ Armed Forces - UAE
  Structured Cabling

- Hamad International Airport - Qatar
  Media Converters

- Hilton Garden Inn - Oman
  IP CCTV System

- Hilton Resort - Ras Al Khaimah
  Video Over Fiber

- Integrated Telecom - KSA
  Environment Monitoring System

- Kuwait Oil Company
  Industrial Switches

- Kuwait University
  Network Cabinets

- Judicial Department - Abu Dhabi
  Data Center Airflow Management Products

- King Abdulaziz City for Science and Technology (KACST) - Saudi Arabia
  Details

- Ministry of Defence - Oman
  Cat6A Cabling

- Ministry of Education - Oman
  Environment Monitoring System

- Louvre Abu Dhabi
  Industrial Switches

- Lusail Multipurpose Hall - Qatar
  PoE Media Converters

- Manazel Al Khor - Dubai
  Cat6A Cabling

- Mashreq Bank Data Centre - UAE
  KVM and Airflow Management

- MBR Solar Park - UAE
  FO Cabling, Industrial Switches

- Mid Field Terminal - Abu Dhabi
  IP55 Cabinets

- Ministry of Defence - Oman
  Cat6A Cabling, Cabinets, KVM, EMS
<table>
<thead>
<tr>
<th>Reference Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Health - Abu Dhabi</td>
</tr>
<tr>
<td>Ministry of Higher Education - Sri Lanka</td>
</tr>
<tr>
<td>Ministry of Interior - Qatar</td>
</tr>
<tr>
<td>Ministry of Justice - Abu Dhabi</td>
</tr>
<tr>
<td>CityCentre</td>
</tr>
<tr>
<td>Mirdif City Centre - Dubai</td>
</tr>
<tr>
<td>Media Converters, IP KVM and Power Management</td>
</tr>
<tr>
<td>NBO</td>
</tr>
<tr>
<td>New Islamabad Intl. Airport - Pakistan</td>
</tr>
<tr>
<td>Ooredoo - Qatar</td>
</tr>
<tr>
<td>Pacific Controls Cloud Services - UAE</td>
</tr>
<tr>
<td>Pearl of Qatar - Doha</td>
</tr>
<tr>
<td>Port of Salalah - Oman</td>
</tr>
<tr>
<td>Presidential Guard - Abu Dhabi</td>
</tr>
<tr>
<td>Presidential Palace - Abu Dhabi</td>
</tr>
<tr>
<td>Roads &amp; Transport Authority - UAE</td>
</tr>
<tr>
<td>Royal Oman Police</td>
</tr>
<tr>
<td>Salik - RTA, Dubai</td>
</tr>
<tr>
<td>Saudi Arabian National Guard</td>
</tr>
<tr>
<td>Supreme Court - Oman</td>
</tr>
<tr>
<td>The Pointe, Palm Jumeirah - Dubai</td>
</tr>
<tr>
<td>UAE Navy</td>
</tr>
<tr>
<td>UAE University - Abu Dhabi</td>
</tr>
<tr>
<td>Vodacom DC - Tanzania</td>
</tr>
<tr>
<td>Warsan Village - Dubai</td>
</tr>
<tr>
<td>ZADCO - Abu Dhabi</td>
</tr>
<tr>
<td>Zayed University - UAE</td>
</tr>
</tbody>
</table>
## Certification / Credential

### BICSI Credentialing Program

<table>
<thead>
<tr>
<th>Certification / Credential</th>
<th>Training</th>
</tr>
</thead>
</table>
| BICSI Registered Communications Distribution Designer (RCDD) | DD101: Foundations of Telecommunications Distribution Design (online)  
DD102: Designing Telecommunications Distribution Systems (5 days) |
| BICSI Registered Telecommunications Project Manager (RTPM) | PM102: Applied Telecommunications Project Management (5 days) |
| BICSI Data Center Design Consultant (DCDC) | DC125: Data Center Design and best Practices (5 days) |
| BICSI Outside Plant (OSP) Designer | OSP102: Applied Outside Plant Design (5 days) |

### BICSI Cabling Installation Program

<table>
<thead>
<tr>
<th>Certification / Credential</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>BICSI Installer 1 (INST1)</td>
<td>IN101: BICSI Installer 1 Training (5½ days)</td>
</tr>
<tr>
<td>BICSI Installer 2, Copper (INSTC)</td>
<td>IN225: BICSI Installer 2, Copper Training (5½ days)</td>
</tr>
<tr>
<td>BICSI Installer 2, Optical Fiber (INSTF)</td>
<td>IN250: BICSI Installer 2, Optical Fiber Training (5½ days)</td>
</tr>
<tr>
<td>BICSI Technician (TECH)</td>
<td>TE350: BICSI Technician Training (5½ days)</td>
</tr>
</tbody>
</table>

### Other Training Programs

<table>
<thead>
<tr>
<th>Certification / Credential</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIXA AV Installation</td>
<td>AV Installation Skill Day (1 day)</td>
</tr>
<tr>
<td>FOA CFOT Certified Fiber Optic Technician</td>
<td>FOA CFOT Certified Fiber Optic Technician (3 days)</td>
</tr>
<tr>
<td>FOA CPCT Certified Premise Cabling Technician</td>
<td>FOA CPCT Certified Premise Cabling Technician (3 days)</td>
</tr>
<tr>
<td>Capitoline DCD – Data Centre Design</td>
<td>DCD – Data Centre Design Training (3 days)</td>
</tr>
<tr>
<td>Capitoline DCOM – Data Centre Operations Management</td>
<td>DCOM – Data Centre Operations Management Training (3 days)</td>
</tr>
<tr>
<td>Fluke Networks CCTT – Certified Cabling Test Technician</td>
<td>CCTT – Certified Cabling Test Technician Training (2 days)</td>
</tr>
</tbody>
</table>
### Distance Supported on Optical Fiber

<table>
<thead>
<tr>
<th>Optical Fiber</th>
<th>100 Mb/s</th>
<th>1 Gb/s</th>
<th>10 Gb/s</th>
<th>40 Gb/s</th>
<th>100 Gb/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>OM1 (62.5/125)</td>
<td>2,000 m</td>
<td>275 m</td>
<td>33 m</td>
<td>n/s</td>
<td>n/s</td>
</tr>
<tr>
<td>OM2 (50/125)</td>
<td>2,000 m</td>
<td>550 m</td>
<td>82 m</td>
<td>n/s</td>
<td>n/s</td>
</tr>
<tr>
<td>OM3 (50/125)</td>
<td>2,000 m</td>
<td>800 m</td>
<td>300 m</td>
<td>100 m</td>
<td>100 m</td>
</tr>
<tr>
<td>OM4 (50/125)</td>
<td>2,000 m</td>
<td>1,000 m</td>
<td>450 m</td>
<td>150 m</td>
<td>150 m</td>
</tr>
<tr>
<td>OS1</td>
<td>n/s</td>
<td>5,000 m</td>
<td>10,000 m</td>
<td>10,000 m</td>
<td>10,000 m</td>
</tr>
<tr>
<td>OS2</td>
<td>n/s</td>
<td>5,000 m</td>
<td>10,000 m</td>
<td>10,000 m</td>
<td>10,000 m</td>
</tr>
</tbody>
</table>

**dB (decibel):** A logarithmic unit for measuring the relative voltage, power (in watts) or strength (in voltage or current) of a signal.

- **+3 dB** Gain 100%
- **0 dB** No gain, no loss
- **-3 dB** Loss 50%
- **-6 dB** Loss 75%
- **-10 dB** Loss 90%

### Pair Identification Colors

<table>
<thead>
<tr>
<th>Ring Conductors</th>
<th>Tip Conductors</th>
</tr>
</thead>
<tbody>
<tr>
<td>White (1-5)</td>
<td>Blue</td>
</tr>
<tr>
<td>Red (6-10)</td>
<td>Orange</td>
</tr>
<tr>
<td>Black (11-15)</td>
<td>Green</td>
</tr>
<tr>
<td>Yellow (16-20)</td>
<td>Brown</td>
</tr>
<tr>
<td>Violet (21-25)</td>
<td>Slate</td>
</tr>
</tbody>
</table>

### American Wire Gauge (AWG)

<table>
<thead>
<tr>
<th>AWG Size</th>
<th>Conductor Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4.1</td>
</tr>
<tr>
<td>14</td>
<td>1.6</td>
</tr>
<tr>
<td>19</td>
<td>0.91</td>
</tr>
<tr>
<td>22</td>
<td>0.64</td>
</tr>
<tr>
<td>23</td>
<td>0.57</td>
</tr>
<tr>
<td>24</td>
<td>0.51</td>
</tr>
<tr>
<td>26</td>
<td>0.41</td>
</tr>
</tbody>
</table>

### Optical Fiber Color Code (ANSI/TIA-598-D)

<table>
<thead>
<tr>
<th>Fiber / Unit Number</th>
<th>Fiber Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blue</td>
</tr>
<tr>
<td>2 - 5</td>
<td>Orange</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
</tr>
<tr>
<td>7 - 11</td>
<td>Brown</td>
</tr>
<tr>
<td>12</td>
<td>Slate</td>
</tr>
<tr>
<td>13 and higher</td>
<td>White, Red, Black, Yellow, Violet, Rose, Aqua</td>
</tr>
</tbody>
</table>

- The color codes are repeated and striped with black (instead of black which is striped with yellow). Every twelve adds one stripe.

### High-Pair Count Cables

- For cables with more than 25 pairs:
  - The first group of 25 pairs is formed into a bundle and has a colored binder around the bundle.
  - Additional bundles (25 pairs) have their own unique colored binder.
  - The colored binder wraps follow the same color code as the individual pair color code.

- Referred to as binder groups or binders.

- **Rack Unit (RU)** 1U / 1RU = 44.45mm (1.75 in)

### Cable Type

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Standard Jacket Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimode (62.5/125), OM1, Indoor</td>
<td>Orange</td>
</tr>
<tr>
<td>Multimode (50/125), OM2, Indoor</td>
<td>Orange</td>
</tr>
<tr>
<td>Multimode 50/125, (laser-optimized), OM3, OM4, Indoor</td>
<td>Aqua</td>
</tr>
<tr>
<td>Multimode 50/125, (laser-optimized), wide band multimode fiber (WBMMF), OM5, Indoor</td>
<td>Lime Green</td>
</tr>
<tr>
<td>Single-mode, Indoor</td>
<td>Yellow</td>
</tr>
<tr>
<td>Polarization Maintaining Single-mode, Indoor</td>
<td>Blue</td>
</tr>
<tr>
<td>Outside Plant (OSP)</td>
<td>Black</td>
</tr>
</tbody>
</table>