Data Sheets

Communication Network

- Industrial 12 Port Gigabit managed switch
- 8 x 10/100/1000 Mbit/s RJ45 ports
- 2 x 1000/100 Mbit/s SFP ports (optional)
- 2 x 100 Mbit/s SC ports (optional)
- USB 2.0 for data storage
- 2 x COM-ports (RS232/485)
- Service friendly remote managing and activity LED showing operational status
- Port mirroring
- RSTP, LACP, VLAN (IEEE 802.1Q), LLDP, ICMP, DHCP, DNS, SNMP, HTTP, FTP, SNTP, IGMP, RFC2217, RMON, RRR (Rapid Ring Recovery)

The ES1000 Gigabit Ethernet Switch
The Ethernet switch ES1000 is developed for all types of industrial environment, where a highly reliable communication is required. It ensures optimal operation, great security and advanced data collection.

Unlike other products, the ES1000 has 2 integrated serial ports which can be shared over the Ethernet. For example, you can connect your RS485 serial devices – such as PLC, meters, and sensors – to ES1000 and make it possible for your software to access serial devices anywhere over a local LAN or the Internet. Serial ports can be configured independently to RS232 or RS485.

Additionally, the ES1000 regular communication cables can be replaced with fibre optics cables which provide isolated communication and SC or SFP or their combination can be used for this purpose. A battery can be connected to the switch which has an internal charger for battery backup.

The ES1000 has 3 potential free relay outputs. The user can program the relay and enjoy from the possibility of remote surveillance and control functions.

The Ethernet Switch ES1000 in the Wind Power Industry
The ES1000 is perfect for communication with controllers of wind turbine. It can be combined with all types of controllers that communicate with serial or Ethernet standards. Additionally, the optic fibre cable provides optimal lightning and over voltage protection. The support of standard SFP (Small Form Factor Pluggable) allows the user to choose fibre according to the distance. The ES1000 software can be remotely updated.

Features
- The Ethernet switch ES1000 is designed for stand-alone operation and is constructed for high reliability. For long range communication ES1000 can be used to build a fibre optic ring with one spare link for backup. This setup paired with Rapid Ring Recovery solution provides high communication safety, as this configuration allows operation despite of a defect optic fibre or link failure. When a fault is detected, the ring automatically heals itself by sending traffic over a protected redundant path. The protection switch can be performed in less than 10 milliseconds causing minimal traffic hit.
- ES1000 also supports remote managing for remote status and fast servicing.
- ES1000 is extensible with two serial COM-port modules for network communication with the IC500, WP3x00 family, WP4x00 family and/or WP2000 controllers and/or WP4086 CMS

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(Condition Monitoring) system. All ports have a diagnostic LED flashing for port activity for fast servicing.

- The ES1000 is powered by +24 VDC and has an integrated +12 VDC battery charger for backup battery.
- Connectivity can be used as a redundant connection between switches or for remote data exchanging.
- Software parameters can be adjusted e.g. on remote, even while the wind turbine is running.
- ES1000 provides for reliable long range communication. Multiple ES1000 switches can be connected into a ring using several fibre pairs in parallel. This setup provides high communication safety, as this configuration allows operation despite of a defect optic fibre. In addition, the redundant links can be aggregated together to form a logical channel that increases the link speed beyond the limits of a single port.
- The ES1000 features a flexible quality of service mechanism or the ability to provide different priority to different applications or data flows. When the switch receives a frame from the port it examines the frame data and assigns a priority. Based on the determined priority, higher priority frames take precedence over lower priority frames during forwarding through the switch. The priorities can be assigned based on port number, user priority in the VLAN tag header, Differentiated Services Code Point (DSCP) from the IP header.
- The ES1000 supports IGMP snooping. When this feature is enabled, the switch will limit the forwarding of multicast frames to only ports that are a member of the multicast group. Hosts on a local network will not be bothered with multicast traffic they have not solicited.
- The ES1000 has an option to mirror all frames belonging to a specific VLAN or received on specific ports to a network monitoring connection on another switch port. This is commonly used for network appliances that require monitoring of network traffic.
- The ES1000 supports Link Layer Discovery Protocol. This is a vendor-neutral Link Layer protocol used by network devices for advertising their identity, capabilities, and neighbors on the LAN. By enabling this protocol the network administrators simplify the job tracking their network devices, and determining their characteristics (manufacturer, software and hardware versions, serial number, etc).
- For easier and faster network configuration ES1000 provides “ping utility” via WEB interface. Network administrator can check from WEB whether the remote host is alive, without using a serial cable and typing a command in the terminal. In a big network with lots of switches, time needed for network investigating and configuration can be reduced.
- The ES1000 allows limiting broadcast and multicast frames, which are forwarded through the switch. It allows increasing reliability of switch and network as a whole. Also network administrator can limit all traffic separately per port. For the excess traffic two actions can be selected: drop all frames or use Flow control mechanism.
- Security in industrial networks is very important. ES1000 provides two mechanisms for security purposes: ACL (Access Control List) by MAC and IP filter. ACL by MAC allows the network administrator to specify list of client MAC addresses and select one of two actions: deny or accept all frames from them. Filter by IP address allows to specify the network/subnetwork which will be blocked.
- The ES1000 provides logging system for all important modules. All logs are archived and saved on non-volatile memory. Network administrator can download these log files to PC for further analysing or use a WEB page to monitor them directly.

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Technical Data

Supply Voltage 1	
Nominal	24 VDC
Allowed range	19 to 30 VDC

Current Consumption 1	
Typical	850 mA
Maximum	1900 mA

Power Consumption 1	
Typical	20 W
Maximum	25 W

Supply Voltage from Backup Power	
Nominal	12 VDC
Allowed range	10.7 to 15 VDC

Current Consumption from Backup Power	
Typical	1500 mA
Maximum	2000 mA

Power Consumption from Backup Power	
Typical	18 W
Power Consumption	22 W

Digital Input	
No. of inputs	3
Number of groups	1
Points per group	3
Isolation	Optocoupler
Nominal voltage	24 VDC
Signal "1"	15 to 30 VDC
Signal "0"	0 to 5 VDC
Input current / signal "1"	12 mA max.
Input impedance	2.4 KΩ

Digital Output	
No. of outputs	3
Number of groups	1
Points per group	3
Isolation	Relay contact
Switching voltage	30 V max.
Switching current	1A
Output current, signal "1"	
Rated breaking capacity	24 W
Max. per group	3 x 1A

RS232 Communication Port	
No. of ports	2
Communication speed	1200 - 115200 BAUD

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Technical Data

Max. cable length	30 m
Recommend cabe type	2 x 2 x 0.25 w/shield
Connector	9-pin sub D connector

RS485 Communication Port	
Communication speed	1200 - 115200 BAUD
Max. cable length	Max. 1200 m at 9600 BAUD
Recommend cabe type	1 x 2 x 0.25 w/shield
Termination	Mount at line ends
Connector	9-pin sub D connector

Ethernet Optical Communication Port (SFP) - Optional	
Communication speed	1000/100/10 Mbit/s
Distance	Up to 2 km with 50/62.5 µm multimode optic at 100 Mbit/s Up to 550 m with 50/125 µm multimode optic at 1000 Mbit/s Up to 40 km with 9 µm singlemode optic at 100 Mbit/s Up to 10 km with 9 µm singlemode optic at 1000 Mbit/s

Ethernet Optical Communication Port (SC) - Optional	
Communication speed	100 Mbit/s
Fiber type	Multimode 62.5/125 µm or 50/125 µm
Wave length	1300 nm
Distance	Up to 2 km

Ethernet RJ45 Communication Port	
Communication speed	1000/100/10 Mbit/s
Max. Cable langth	50 m
Connector	RJ 45

Permissible Ambient Conditions	
Operation temperature	-30 to 60 °C
Transportation / Storage temperature	-40 to 85 °C
Max. relativi humidity	Max. 95% RH (non-condensing @ 40 °C)
Max. operation height	2000 m above sea level (higher levels only by special agreement with Mita-Teknik)

Construction	
Dimensions (WxHxD)	170 x 166 x 65 mm
Required gap (top/buttom)	25 mm min.
Weight	800 g max.

Degree of Protection	
Degree of protection	IP30
Standards	EN61000-6-2 (CE Generic Immunity) EN61000-6-4 (CE Generic Emission) EN61000-4-5 (Surge)

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Mita-Teknik Ordering Information

Order Number	Variant	Order Name
9711100002	Config 01	ES1000
	Config 02	ES1000-2SC
	Config 03[1]	ES1000-2SFP
	Config 04	ES1000-2SC-2SC
	Config 05[1]	ES1000-2SFP-2SFP

[1]SFP modules not included

Accessories	
9788080	WP-Line 80 LED module
3389210	Ethernet Patch Cable 1 m
3389220	Ethernet Patch Cable 2 m
3389250	Ethernet Patch Cable 5 m
3370515	Fibre Optical Patch Cable 2X 62.5 µm SC/SC-D 1 m
3370525	Fibre Optical Patch Cable 2X 62.5 µm SC/SC 2 m
3370545	Fibre Optical Patch Cable 2X 62.5 µm SC/SC-D 5 m
3370537	Fibre Optical Patch Cable 2X 62.5 µm LC/LC-D 3 m
3370547	Fibre Optical Patch Cable 2X 62.5 µm LC/LC-D 5 m
9711100091	Connector Kit Screw Black ES1000
0500040	LEAD-ACID Battery 12V 7.2 AH (4 hours operation @ 25 °C)
0500046	LEAD-ACID Battery 12V 12 AH (7 hours operation @ 25 °C)
0500100	LEAD-ACID Battery 12V 28 AH (20 hours operation @ 25 °C)
2330500	Singlemode Optic 9 µm (40 km) Transceiver
2330510	Multimode Optic 50/62.5 µm (2 km) Transceiver
2330520	1G Singlemode Optic 9/125 µm (10 km) Transceiver
2330530	1G Multimode Optic 50/125 µm (0.55 km) Transceiver

Configuration List		
Order name	Port 9, 10	Port 11, 12
ES1000	-	-
ES1000-2SC	SC	-
ES1000-2SFP	SFP	-
ES1000-2SC-2SC	SC	SC
ES1000-2SFP-2SFP	SFP	SFP

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- Industrial 12 Port Gigabit managed router
- 8 x 10/100/1000 Mbit/s RJ45 ports
  2 x 1000/100 Mbit/s SFP ports (optional)
  2 x 100 Mbit/s SC ports (optional)
- Each port can be configured as WAN interface for Internet connection
- USB 2.0 for data storage
- 2 x COM-ports (RS232/485/422)
- Service friendly remote managing and activity LED showing operational status
- Port mirroring
- RSTP, LACP, VLAN (IEEE 802.1Q), LLDP, ICMP, DHCP, DNS, SNMP, HTTP, FTP, SNTP, IGMP snooping, RFC2217, RMON, static routes, firewall, DynDNS, Dial-In, Dial-Up, OpenVPN, SOCKS, COM server, RRR (Rapid Ring Recovery)

The ER1000 Gigabit Ethernet Router

The industrial router ER1000 is a combined device that can be used for various purposes. It can function as a L2 Ethernet switch, Internet gateway router, DHCP server, time server, etc. The Ethernet Router ER1000 is developed specifically for industrial environments, where highly reliable communication is required. It is the perfect match to ensure the communication between the WP4100 controller and the rest of the monitoring equipment and can provide can Internet access. It will ensure optimal operation, allow advanced data collection and a high degree of security.

The ER1000 features 2 integrated serial ports which can be shared over the Ethernet. For example, you can connect your RS485 serial devices – such as the PLC, meters, and sensors – to ER1000 and allow your software to access serial devices anywhere through a local LAN or the Internet.

Additionally, ER1000 regular communication cables can be replaced with fiber optic cables which provide isolated communication and SC or SFP connectors or their combination can be used for this purpose. A battery can be connected to the router which has an internal charger for battery backup, and can supply the router for 24 hours.

The ER1000 has 3 potential free relay outputs. The user can program the relay and enjoy from the possibility of remote surveillance and control functions.

The ER1000 has a network manager that provides several setups to the Internet with connection redundancy. For example you can have Dial-Up and PPPoE connection. When problem on Dial-Up occurs it switches to another connection automatically. It makes connection to the Internet more reliable and helps to prevent lost of connection to the device and wind park from the Internet. It also has OpenVPN feature that helps to protect connection to the device or user's LAN.

The ER1000 supports Dial-In service that provides Dial-In communication to the device in any time using phone line with standard modem. Also, ER1000 supports strong firewall service to prevent attack and unauthorized access to the device or user's LAN. Due to its high CPU performance the ER1000 device can route frames between LAN and WAN on speed up to 72 Mbps. In case when use security VPN tunnel from WAN it is up to 20 Mbps.

The Ethernet Router ER1000 in the Wind Power Industry
The ER1000 allows you to connect to the park of wind turbines to the Internet and communicate with them securely. You can build a firewall on the ER1000 which will protect the local network from unauthorized access from the Internet. In addition, you can set up a VPN server which will accept connections only from persons or computers owning X.509 certificates issued by your own private certificate authority.

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The traffic over VPN connection can further be encrypted by using strong ciphering algorithms. It is perfect for communication with controllers of the wind turbine. It can be combined with all types of controllers that communicate with serial or Ethernet standards.

Additionally, the optic fibre cable provides optimal lightning and over voltage protection. The support of standard SFP (Small Form Factor Pluggable) allows the user to choose fibre according to the distance. The ER1000 software can be remotely updated.

Features

- The ER1000 supports several Internet connection types: PPPoE, Ethernet wire and Dial-up. All of connections can acts as redundant connection to the Internet and can be activated when main connection is lost. Also, ER1000 can diagnose connection using ping utility to prevent problem of connection on side of ISP. All of this helps to have more reliable connection to the Internet and prevent connection losing.
- The ER1000 supports “iptables” based firewall that helps to configure a strong protected network. It provides full configuration interface and simplified that helps user to configure connection security rapidly and without knowledge of “iptables”. Simplified firewall GUI helps to configure all main security features including NAT, PAT and traffic filtering.
- The ER1000 supports OpenVPN service. It helps to make connection to the device encrypted with strong cipher algorithm and keep secret data.
- The ER1000 supports Dial-In connection. It helps to make incoming connection to the device using standard telephone modem and have access to internal LAN. Such connection, for example, can be used for collection data from WP4x00 system or other devices in wind park LAN.
- The ER1000 supports DynDNS service that lets to assign host name to ER1000 giving an easy way to find it on the Internet. It is also useful when you do not have reliable Internet connections. DynDNS client keeps router’s host up-to-date with its changed public IP address.
- The ER1000 supports SOCKS proxy server. It allows clients to make connections to wind park outflank firewall. Also, it can be useful when user wish to have connections from Internet to two wind parks with the same network settings.
- The Ethernet router ER1000 is designed for stand-alone operation and constructed for high reliability. For long range communication ER1000 can be used to build a fibre optic ring with one spare link for backup. This setup paired with Rapid Ring Recovery, which provides high communication safety, as this configuration allows operation despite of a defect optic fibre or link failure. When a fault is detected, the ring automatically heals itself by sending traffic over a protected redundant path. Protection switch can be performed in less than 10 milliseconds causing minimal traffic hit.
- ER1000 also supports remote managing for remote status and fast servicing.
- ER1000 is extensible with two serial COM-port modules for network communication with the IC500, WP3x00 family, WP4x00 family and/or WP2000 controllers and/or WP4086 CMS system. All ports have a diagnostic LED flashing for port activity for fast servicing.
- The ER1000 is powered by +24 VDC and has an integrated +12 VDC battery charger for backup battery.
- Software parameters can be adjusted e.g. remotely, even while the wind turbine is running.
- The ER1000 provides reliable long range communication.
- Multiple ER1000 routers can be connected into a ring using several fibre pairs in parallel. This setup provides high communication safety, as this configuration allows operation despite of a defect optic fibre. In addition, the redundant links can be aggregated together to form a logical channel that increases the link speed beyond the limits of a single port.
- The ER1000 features a flexible quality of service mechanism or the ability to provide different priority to different applications or data flows. When the device receives a frame from the port it examines the frame data and assigns a priority. Based on the determined priority, higher priority frames take precedence over lower priority frames during forwarding through the device. The priorities can be assigned based on port number, user priority in the VLAN tag header, Differentiated Services Code Point (DSCP) from the IP header.

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- The ER1000 supports IGMP snooping. When this feature is enabled, the device will limit the forwarding of multicast frames to only ports that are a member of the multicast group. Hosts on a local network will not be bothered with multicast traffic they have not solicited.

- The ER1000 has an option to mirror all frames belonging to a specific VLAN or received on specific ports to a network monitoring connection on another router port. This is commonly used for network appliances that require monitoring of network traffic.

- The ER1000 supports Link Layer Discovery Protocol. This is a vendor-neutral Link Layer protocol used by network devices for advertising their identity, capabilities, and neighbors on the LAN. By enabling this protocol the network administrators simplify the job tracking their network devices, and determining their characteristics (manufacturer, software and hardware versions, serial number, etc).

- For easier and faster network configuration ER1000 provides "ping utility" via WEB interface. Network administrator can check from WEB whether the remote host is alive, without using a serial cable and typing a command in the terminal. In a big network with lots of switches, time needed for network investigating and configuration can be reduced.

- The ER1000 allows limiting broadcast and multicast frames, which are forwarded through the router. It allows increasing reliability of router and network as a whole. Also network administrator can limit all traffic separately per port. For the excess traffic two actions can be selected: drop all frames or use Flow control mechanism.

- Security in industrial networks is very important. ER1000 provides two mechanisms for security purposes: ACL (Access Control List) by MAC and IP filter. ACL by MAC allows the network administrator to specify list of client MAC addresses and select one of two actions: deny or accept all frames from them. Filter by IP address allows to specify the network/ subnetwork which will be blocked.

- The ER1000 provides logging system for all important modules. All logs are archived and saved on non-volatile memory. Network administrator can download these log files to PC for further analysing or use a WEB page to monitor them directly.

Technical Data

Supply Voltage 1	
Nominal	24 VDC
Allowed range	19 to 30 VDC

Current Consumption 1	
Typical	850 mA
Maximum	1900 mA

Power Consumption 1	
Typical	20 W
Maximum	25 W

Supply Voltage from Backup Power	
Nominal	12 VDC
Allowed range	10.7 to 15 VDC

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Technical Data

Current Consumption from Backup Power	
Typical	1500 mA
Maximum	2000 mA

Power Consumption from Backup Power	
Typical	18 W
Power consumption	22 W

Digital Input	
No. of inputs	3
Number of groups	1
Points per group	3
Isolation	Optocoupler
Nominal voltage	24 VDC
Signal "1"	15 to 30 VDC
Signal "0"	0 to 5 VDC
Input current / signal "1"	12 mA max.
Input impedance	2.4 KΩ

Digital Output	
No. of outputs	3
Number of groups	1
Points per group	3
Isolation	Relay contact
Switching voltage	30 V max.
Switching current	1A
Output current, signal "1"	
Rated breaking capacity	24 W
Max. per group	3 x 1A

RS232 Communication Port	
No. of ports	2
Communication speed	1200 - 115200 BAUD
Max. cable length	30 m
Recommend cabe type	2 x 2 x 0.25 w/shield
Connector	9-pin sub D connector

RS422/RS485 Communication Port	
Communication speed	1200 - 115200 BAUD
Max. cable length	Max. 1200 m at 9600 BAUD
Recommend cabe type	1 x 2 x 0.25 w/shield
Termination	Mount at line ends
Connector	9-pin sub D connector

Ethernet Optical Communication Port (SFP) - Optional	
Communication speed	1000/100/10 Mbit/s
Distance	Up to 2 km with 50/62.5 µm multimode optic at 100 Mbit/s Up to 550 m with 50/125 µm multimode optic at 1000 Mbit/s Up to 40 km with 9 µm singlemode optic at 100 Mbit/s Up to 10 km with 9 µm singlemode optic at 1000 Mbit/s

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Technical Data

Ethernet Optical Communication Port (SC) - Optional	
Communication speed	100 Mbit/s
Fiber type	Multimode 62.5/125 µm or 50/125 µm
Wave length	1300 nm
Distance	Up to 2 km

Ethernet RJ45 Communication Port	
Communication speed	1000/100/10 Mbit/s
Max. cable length	50 m
Connector	RJ 45

Routing	
Communication speed (Ethernet WAN to LAN)	Max 72 Mbit/s

VPN	
Communication speed	Max 20 Mbit/s

Permissible Ambient Conditions	
Operation temperature	-30 to 60 °C
Transportation / Storage temperature	-40 to 85 °C
Max. relativi humidity	Max. 95% RH (non-condensing @ 40 °C)
Max. operation height	2000 m above sea level (higher levels only by special agreement with Mita-Teknik)

Construction	
Dimensions (WxHxD)	170 x 166 x 65 mm
Required gap (top/buttom)	25 mm min.
Weight	800 g max.

Degree of Protection	
Degree of protection	IP30
Standards	EN 61000-6-2 (Generic Standards – Immunity standard for industrial environments) EN 61000-6-4 (Generic Standards – Emission standard for industrial environments)

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Mita-Teknik Ordering Information

Order Number	Variant	Order Name
9711110002	Config 01[1]	ER1000
	Config 02[1]	ER1000-2SC
	Config 03[1, 2]	ER1000-2SFP
	Config 04[1]	ER1000-2SC-2SC
	Config 05[2]	ER1000-2SFP-2SFP

[1]Upon customer request
[2]SFP modules not included

Accessories	
9788080	WP-Line 80 LED module
3389210	Ethernet Patch Cable 1 m
3389220	Ethernet Patch Cable 2 m
3389250	Ethernet Patch Cable 5 m
3370515	Fibre Optical Patch Cable 2X 62.5 µm SC/SC-D 1 m
3370525	Fibre Optical Patch Cable 2X 62.5 µm SC/SC 2 m
3370545	Fibre Optical Patch Cable 2X 62.5 µm SC/SC-D 5 m
3370537	Fibre Optical Patch Cable 2X 62.5 µm LC/LC-D 3 m
3370547	Fibre Optical Patch Cable 2X 62.5 µm LC/LC-D 5 m
9711100091	Connector Kit Screw Black ES1000 / ER1000
0500040	LEAD-ACID Battery 12V 7.2 AH (4 hours operation @ 25 °C)
0500046	LEAD-ACID Battery 12V 12 AH (7 hours operation @ 25 °C)
0500100	LEAD-ACID Battery 12V 28 AH (20 hours operation @ 25 °C)
2330500	Singlemode Optic 9 µm (40 km) Transceiver
2330510	Multimode Optic 50/62.5 µm (2 km) Transceiver
2330520	1G Singlemode Optic 9/125 µm (10 km) Transceiver
2330530	1G Multimode Optic 50/125 µm (0.55 km) Transceiver

Configuration List		
Order Name	Port 9, 10	Port 11, 12
ER1000	-	-
ER1000-2SC	SC	-
ER1000-2SFP	SFP	-
ER1000-2SC-2SC	SC	SC
ER1000-2SFP-2SFP	SFP	SFP

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- Robust industrial designed WiFi access point
- IP 55 outdoor
- Wireless access to turbine controller with MiConnect, from mobile phones or tablets
- Easy to install
- Service friendly – control and monitor turbine wirelessly from anywhere inside the turbine
- 300 Mbps data rate
- Configuration backup and restore
- Fast Ethernet RJ45
- Personal security settings
- Web access to management interface
- Operating temperature range from -30 to 60°C

Wireless Service Point - Flex
The Wirelesss Service Point – Flex is designed to meet the needs of service engineers travelling from turbine to turbine. The portable magnetic mounting kit enables you to install the device on any magnetic surface, and gain wireless access to the wind turbine control system.

The Wireless Service Point – Flex is a cost-effective 802.11b/g/n outdoor WiFi Access Point operating in 2.4 GHz band and features a built-in dual-polarity antenna with dual Ethernet ports. The Wireless Service Point supports passive 24 VDC PoE allowing easy installation, without any environment limitations. With the included AC to PoE injector, you can supply the Wireless Service Point from 100-240 VAC.

The Wireless Service Point - Flex is designed for wall, pole or magnetic mounting.

The Wireless Service Point – Flex provides support for accessing the Mita-Teknik Wind Turbine Control System directly from portable devices like tablets, smart-phones and laptops.

Specifications subject to change

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Technical Data

Power Input	
Nominal	Support 24Vdc Power over Ethernet (Passive PoE)

Power Consumption	
Nominal	Max. 2.4W

Ethernet Interfaces	
WAN / LAN	Two 10M/100M Fast Ethernet ports

WiFi Interfaces	
Wireless Radio	2 x 2 MIMO radios
RF Output power	IEEE802.11b
	- 27±2dBm@1M
	- 27±2dBm@11M
	IEEE802.11g
	- 27±2dBm@6M
	- 23±2dBm@54M
	IEEE802.11g/n HT20
	- 27±2dBm@MCS0/8
	- 22±2dBm@MCS7/15
	IEEE802.11g/n HT40
	- 27±2dBm@MSC0/8
	- 22±2dBm@MCS7/15
Receive sensitivity	IEEE802.11b
	- 95±2dBm@1M
	- 90±2dBm@11M
	IEEE802.11g
	- 90±2dBm@6M
	- 75±2dBm@54M
	IEEE802.11g/n HT20
	- 91±2dBm@MCS0/8
	- 72±2dBm@MCS7/15
	IEEE802.11g/n HT40
	- 88±2dBm@MSC0/8
	- 69±2dBm@MCS7/15

Permissible Ambient Conditions	
Operation temperature	-30 to +60°C
Storage temperature	-35 to +75°C
Relative humidity	Max. 95% RH (non-condensing @40°C)
Operation altitude	Max. 2000m above sea level (up to 4000m at derated temperature)

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Technical Data

Mechanical Information	
Dimensions (WxHxD)	280 x 90 x 47mm
Weight	342g
Degree of protection	IP55

Applied Standards	
Radio	ETSI EN 300 328
EMC	ETSI EN 301 489-1 ETSI EN 301 489-17

Supported Controllers in Permanent Installation closer than 1000 metres to other Turbines	
WP100 Controller – 00	
WP100 Controller – 30	
WP100 Controller – 31	Only supported when there is only one group in the turbine controller system
WP100 Controller – 32	
WP3x00 MK II	Only supported when there is only one group in the turbine controller system

Mita-Teknik Ordering Information

Order Number	Order Name
8945985	Wireless Service Point – Flex, CHN - pwr. cord type A
8945997	Wireless Service Point – Flex, EU - pwr. Cord type E

Accessories	
3389210	Ethernet Patch Cable RJ45, Cat. 6 STP Shielded Grey 1 m
3389220	Ethernet Patch Cable RJ45, Cat. 6 STP Shielded Grey 2 m
3389250	Ethernet Patch Cable RJ45, Cat. 6 STP Shielded Grey 5 m

Mita-Teknik

- Robust industrial designed WiFi access point
- IP 55 outdoor
- Wireless access to turbine controller with MiConnect, from mobile phones or tablets
- Easy to install
- Service friendly – control and monitor turbine wirelessly from anywhere inside the turbine
- 300 Mbps data rate
- Configuration backup and restore
- Fast Ethernet RJ45
- Personal security settings
- Web access to management interface
- Operating temperature range from -30 to 60°C

Wireless Service Point - Plus
The Wireless Service Point – Plus, is easy to install in any cabinet. It features feed-through antennas, for mounting on the outside of the cabinet, giving you a permanent and very robust wireless access point for accessing the Mita-Teknik Wind Turbine Control System. The Wireless Service Point enables you to easily access and control the turbine when performing service.

The Wireless Service Point - Plus is a cost effective 802.11b/g/n outdoor WiFi Access Point operating in 2.4 GHz band. For connecting the external antenna, the unit is equipped with detachable SMA connectors with dual Ethernet ports. The Wireless Service Point supports passive 24 VDC PoE allowing easy installation, without any environment limitations. With the included AC to PoE injector, you can supply the Wireless Service Point from 100-240 VAC.

The Wireless Service Point - Plus is designed for wall, pole or magnetic mounting.

The Wireless Service Point – Plus provides support for accessing the Mita-Teknik Wind Turbine Control System directly from portable devices like tablets, smart-phones and laptops.

Specifications subject to change

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Technical Data

Power Input	
Nominal	Support 24Vdc Power over Ethernet (Passive PoE)

Power Consumption	
Nominal	Max. 2.4W

Ethernet Interfaces	
WAN / LAN	Two 10M/100M Fast Ethernet ports

WiFi Interfaces	
Wireless Radio	2 x 2 MIMO radios
RF Output power	IEEE802.11b - 27±2dBm@1M - 27±2dBm@11M IEEE802.11g - 27±2dBm@6M - 23±2dBm@54M IEEE802.11g/n HT20 - 27±2dBm@MCS0/8 - 22±2dBm@MCS7/15 IEEE802.11g/n HT40 - 27±2dBm@MSC0/8 - 22±2dBm@MCS7/15
Receive sensitivity	IEEE802.11b - 95±2dBm@1M - 90±2dBm@11M IEEE802.11g - 90±2dBm@6M - 75±2dBm@54M IEEE802.11g/n HT20 - 91±2dBm@MCS0/8 - 72±2dBm@MCS7/15 IEEE802.11g/n HT40 - 88±2dBm@MSC0/8 - 69±2dBm@MCS7/15

Permissible Ambient Conditions	
Operation temperature	-30 to +60°C
Storage temperature	-35 to +75°C
Relative humidity	Max. 95% RH (non-condensing @40°C)
Operation altitude	Max. 2000m above sea level (up to 4000m at derated temperature)

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Technical Data

Mechanical Information	
Antenna cable length	2 meters
Dimensions (WxHxD)	280 x 90 x 47mm
Weight	342g
Degree of protection	IP55

Applied Standards	
Radio	ETSI EN 300 328
EMC	ETSI EN 301 489-1 ETSI EN 301 489-17

Supported Controllers in Permanent Installation closer than 1000 metres to other Turbines	
WP100 Controller – 00	
WP100 Controller – 30	
WP100 Controller – 31	Only supported when there is only one group in the turbine controller system
WP100 Controller – 32	
WP3x00 MK II	Only supported when there is only one group in the turbine controller system

Mita-Teknik Ordering Information

Order Number	Order Name
8945990	Wireless Service Point – Plus, CHN - pwr. cord type A
8945998	Wireless Service Point – Plus, EU - pwr. cord type E

Accessories	
3389210	Ethernet Patch Cable RJ45, Cat. 6 STP Shielded Grey 1 m
3389220	Ethernet Patch Cable RJ45, Cat. 6 STP Shielded Grey 2 m
3389250	Ethernet Patch Cable RJ45, Cat. 6 STP Shielded Grey 5 m

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