



Features

- Surge protection increases reliability
- Handles analog, serial, and Ethernet sensors
- Easy to configure and wire sensors
- Able to cycle power for individual sensors
- Optimizes charging voltage according to temperature
- Detects faulty battery

Vaisala Power Management Unit PMU701 manages power and sensor communication within Vaisala Road Weather Station RWS200.

Centralized power management

PMU701 handles the specific power requirements of the sensors, making sure that each sensor receives steady and suitable power at all times.

PMU701 is also responsible for charging the internal backup battery inside the RWS200 enclosure. If an external DC power supply is used with the road weather station, the power is routed through PMU701.

In total, PMU701 provides 1 external DC input, 2 solar panel inputs, 4 inputs for analog sensor communications, and 14 inputs for serial communication, 8 of which can be Ethernet-based communication.

Surge protection

All sensor communication lines and DC power lines route through PMU701 to provide surge protection between the station, the DC power supply, and the individual sensors attached to the weather station.

As the RWS200 weather station enclosure is typically mounted to a pole or a metal lattice mast, lightning strikes are a real danger for the weather station. Proper power protection ensures that power disruptions are kept to a minimum, which increases the overall reliability of the system.

Power control

Continuous and steady power is a luxury for a roadside station. Power Management Unit PMU701 meets the challenges posed by power interruptions and surges caused by, for example, lightning. PMU701 provides surge protection and power to the sensors, including heating power when needed.

Intelligent battery management

PMU701 automatically detects if the backup battery is faulty, missing, or disconnected and reports it. PMU701 stops charging when the battery is faulty,

the ambient temperature inside the enclosure exceeds the battery operating temperature, or PMU701 self-diagnostics detect an internal failure.

Simplified configuration

PMU701 is designed for simplified configuration and wiring during initial setup or when adding new sensors. Grounding each sensor cable shield is simple and easy, and a quick reference card is provided to ensure that each sensor is connected correctly; once again, to add system reliability.

Simplified maintenance

PMU701 has the ability to control and cycle the power of each sensor remotely, making it possible to perform some technical services remotely, such as powering down and restarting individual sensors.

Technical data

PMU701 operating environment

Operating temperature	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-60 ... +80 °C (-76 ... +176 °F)
Operating humidity	5-95 %RH, non-condensing

PMU701 inputs and outputs

Operating voltage	24 V DC (10-32 V DC)
Solar panel input (requires PMP701)	10-32 V DC
External DC power (requires PMP701)	12-28 V DC (max. range 10-32 V DC)
Output power	12 V at 3 A and 24 V at 7 A
Maximum charging current	3.8 A (total) for 24 to 28 Ah battery 1.9 A (total) for 2.6 Ah battery
Nominal charging voltage	13.5 V at +25 °C (+77 °F)

Connectors

DC INPUT	23-32 V at 10 A Phoenix Contact MVSTBR 2,5HC/ 2-ST-5.08
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BATTERY 1, BATTERY 2	2 separately controlled 12 V lead-acid batteries Temperature compensation Deep discharge protection Charging within battery operating temperature only Phoenix Contact MVSTBR 2,5HC/ 2-ST-5.08
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SERVICE PORT	RS-232 Phoenix Contact DFMC 1,5/5-ST-3,5-LR
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POWER OUT C	12 V out at 1.4 A, 24 V out at 2.8 A Phoenix Contact DFMC 1,5/5-ST-3,5-LR
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ETH 1, ETH 2	10/100 Mbps 2 × RJ45
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DMU	Serial and I/O Molex 90130-3250
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TELECOM	RS-232/RS-485, DC output Phoenix Contact DFMC 1,5/10-ST-3,5-LR
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PMU701 mechanical specifications

Dimensions (H × W × D)	126 × 224 × 142 mm (4.96 × 8.82 × 5.59 in)
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Weight	1.4 kg (3.1 lb)
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Materials

Screws, washers, DIN rail locking piece	Stainless steel AISI 316
Grounding rail clamps	Stainless steel AISI 630
Frame profile	Aluminum EN AW-6060 T6
Cooling plate	Aluminum EN AW-6082 T6
Side plates	Plastic PC/ABS
Grounding rail	Copper (Cu)

Available plug-in module slots

PMP701	Maximum 1 pcs
PMA701	Maximum 2 pcs
PMS701	Maximum 7 pcs ¹⁾
PME701	Maximum 4 pcs ¹⁾

¹⁾ SERIAL/ETHERNET slots can house either PME701 or PMS701 plug-in modules.

PMU701 compliance

EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) amended by 2015/863
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EMC immunity	EN 61326-1, industrial environment FCC part 15 B, Class B ICES-3 / NMB-3 (Class B)
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EMC emissions	CISPR 32 / EN 55032, Class B
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Electrical safety	EN 61010-1
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Dry heat	IEC 60068-2-2
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Vibration	IEC 60068-2-6
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Shock	IEC 60068-2-27
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Rough handling	IEC 60068-2-31
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Damp heat	IEC 60068-2-78
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Compliance marks	CE, FCC, ICES, RCM
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PMU701 spare parts and accessories

Spare part or accessory	Order code
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PMU701 unit including:	PMU701SP
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- Sensor data cable
- Phoenix Contact DFMC 1,5/10-ST-3,5-LR 20-pin cable connector (1 pc)

PMU701 accessories including:	PMU701ACC1SP
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- Torx screws M4×8 ISO14583 TX A4 (4 pcs)
- Torx screws M3×6 ISO14583 A4-60 (6 pcs)
- Cable shield grounding clamps SK 8 (10 pcs) (217844)
- Cable shield grounding clamps SK 14 (10 pcs) (237528)
- Hex-tapped spacers M4×55 FeZn Female/Male (2 pcs)
- Enclosure grounding rail for sensor cables (DRW240852)
- PMU701 grounding rail for sensor cables (DRW240399)

PMU701 accessories including:	PMU701ACC2SP
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- Cable shield grounding clamps SK 8 (10 pcs)
- Cable shield grounding clamps SK 14 (10 pcs)

PMU701 accessories including:	PMU701ACC3SP
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- Set of quick reference cards
- Cable ferrules 0.5 mm² / 10 mm (100 pcs) (237754)
- Phoenix Contact DFMC 1,5/1-ST-3,5-LR 2-pin cable connectors (4 pcs)
- Phoenix Contact DFMC 1,5/3-ST-3,5-LR 6-pin cable connectors (10 pcs)
- Phoenix Contact DFMC 1,5/4-ST-3,5-LR 8-pin cable connectors (10 pcs)
- Phoenix Contact DFMC 1,5/5-ST-3,5-LR 10-pin cable connectors (30 pcs)
- Phoenix Contact DFMC 1,5/8-ST-3,5-LR 16-pin cable connectors (10 pcs)
- Phoenix Contact DFMC 1,5/10-ST-3,5-LR 20-pin cable connectors (5 pcs)
- Phoenix Contact MVSTBR 2,5HC/2-ST-5.08 cable connectors (4 pcs)
- Narrow cover plates for empty slots (7 pcs)
- Wide cover plates for empty slots (3 pcs)

Phoenix Contact DFMC 6-pin cable connector set (10 pcs)	262926
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Phoenix Contact DFMC 8-pin cable connector set (10 pcs)	262923
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Phoenix Contact DFMC 10-pin cable connector set (10 pcs)	262924
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Phoenix Contact DFMC 16-pin cable connector set (10 pcs)	262925
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Phoenix Contact DFMC 20-pin cable connector set (10 pc)	262927
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Accessory set, screws and washers	262928
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Insulated ferrules 0.5 mm ² , length 10 mm, white (100 pcs)	237754SP
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External DC / solar panel input module PMP701 specifications

Surge protection	IEC 61000-4-5: external DC input up to 6 kV (line to GND) / 6 kV (line to line)
Reverse voltage protection	Yes
Solar panel input	2 pcs Maximum 10–32 V DC at 4 A/port
External DC input	1 pc Maximum 10–32 V DC at 15 A
Status LED	Green for each input

Analog input/output module PMA701 specifications

Surge protection	IEC 61000-4-5
Sensor power	12 V at maximum 2 A/port
Sensor power	24 V at maximum 3 A/port
Status LED	Green/Red
Mechanical	Has red circuit board
Digital I/O and differential	
Lines	2
Frequency input signal	1 Hz–20 kHz, 2.5–14 V DC, or 10 mV–15 V DC
Excitation voltage signal	0–12 V DC at 20 mA
Fast input high signal	0–1.8 V DC, 12-bit ADC
Fast input low signal	0–1.8 V DC, 12-bit ADC
Single-ended/Differential measurement mode	Ground
Connectors	Phoenix Contact DFCM 1,5/3-ST-3,5-LR

Serial input/output module PMS701 specifications

Surge protection	IEC 61000-4-5
Sensor power	12 V at maximum 2 A/port
Sensor power	24 V at maximum 3 A/port
Heat output	24 V at maximum 5 A/port
Supports	RS-232 2-wire and 4-wire RS-485 Isolated 2-wire and 4-wire RS-485
Status LED	Green/Orange

Ethernet / Power over Ethernet module PME701 specifications

Surge protection	IEC 61000-4-5
Supported IEEE 802.3af PoE classes / module	1 × PoE class 0 (0.44–12.94 W) device 1 × PoE class 3 (6.49–12.95 W) device 2 × PoE class 1 (0.44–3.84 W) device 2 × PoE class 2 (3.84–6.49 W) device
Status LED	Ethernet link and speed built into connectors

PMU701 plug-in module spare parts

Spare part	Order code
External DC / Solar panel input module	PMP701SP
Analog input/output module with 10-pin cable connectors (2 pcs)	PMA701SP
Serial input/output module with 10-pin cable connectors (2 pcs)	PMS701SP
Ethernet / power over Ethernet module	PME701SP

The following shows an example of a quick reference card used for sensor wiring to PMU701 port.

Example of quick reference card for sensor wiring

