IOT Devices Catalogue

be inavitas

MCU

Master Controller Unit

Device Description

MCU series is a small and compact industrial controller based on a 32-bit 216 MHz ARM CPU. With user-friendly software and hardware, the user can keep application development quick and simplified. MCU can take almost any role in remote utility applications such as solar power plants and electricity distribution substations. It combines GPRS/GSM modem, digital inputs, outputs and datalogger in a single device.Device with built-in 2 digital inputs and outputs and has ethernet and serial communication ports for flexible connectivity to SCADA, field devices and remote control systems.

Device Specifications	
Supply Voltage Range	9-18/18-36 V_{DC}
Nominal Supply Voltage	12/24 V_{DC}
CPU	ARM Cortex-M7 32 Bit 216 Mhz
Flash	1mB
RAM	320 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	8W @ 24 V
Real Time Clock	Available
Configuration	MCU
Data Logging	Yes
Storage	8 GB (Up to 32 GB with SD Card)
Ethernet Specifications	
Data Rates	10 / 100 Mbps
Number of Connections	2
Interface	Ethernet (RJ-45)
DHCP Support	Compatible
Ping Blocking	Yes
Wi-Fi Specifications	
Wi-Fi Protocols	802.11 b/g/n
Frequency Range	2.4 GHz ~ 2.5 GHz (2400M ~ 2483.5M)
RF Certification	SRRC, FCC, CE (RED), IC, NCC, KCC, TELEC (MIC)
Wi-Fi Certification	Wi-Fi Alliance
Wi-Fi Mode	Station / SoftAP / SoftAP + Station
Security	WPA / WPA2
Network Protocols	IPv4, TCP / UDP / HTTP / FTP

GSM Specifications	
Embedded GSM	Yes (Optional)
Operating Frequencies	Standard (Quad Band GSM module 850/900/1800/1900 MHz)
Number of Connections	2
GSM Antenna	824-960/1710-2170 MHz 3dbGSM Antenna
Stop Bit and Parity Bit Adjustment	Yes
Dispatch of warnings and alarms from software as text message to administrators possible	Yes
3G / 4G Connection	IPv4, TCP / UDP / HTTP / FTP
Communication Specifications	
Communication Protocols	Modbus-TCP (Master/Slave), Modbus-RTU (Master), IEC60870-5-104 (Server), IEC62056-21
Serial Interfaces	2 x RS-485 (Isolated), Micro USB C Type 2.0
RS-485 BaudRate	1200bps – 115200bps
USB Data Transfer Speed	480 Mbit/s
Digital Input Specifications	
Number of Digital Input Channels	4
Input Channel Voltage Range	0 – 36 V_{DC} / 0 – 150 V_{DC} / 0 – 250 V_{AC} (Shoud be defined on order)
Input Channel Isolation	Available, Isolated with Optocoupler
Input Current	1.5 mA / Channel
Input Filter	Programmable, Default: 20ms
Input Change Counter	32 Bit
Digital Output Specifications	
Number of Digital Output Channels	2 (Type Dry-Contact)
Output Channel Voltage Range	0 – 36 V_{DC} (Shoud be defined on order)
Nominal Output Voltage	24 V_{DC} / 110 V_{DC} / 220 V_{AC}
Output Type	Dry-Contact Relay
Max. Output Current	2A
Load Type	Resistive, Inductive
Output Channel Isolation	Magnetically
Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	35mm x 100mm x 115mm
Weight	210gr

For any application where precise, cost-effective and ICT enabled energy management is required...

MCU+

Master Controller Unit

with Linux OS

Device Description

MCU+ series is an advanced compact industrial controller based on a 32-bit 454 MHz ARM CPU. With the power of Linux OS, the user can keep application development quick and simplified. MCU+ can take almost any role in remote utility applications such as solar power plants and electricity distribution substations. It combines GPRS/GSM modem, WiFi and Bluetooth, and datalogger in a single device. MCU+ has ethernet and serial communication ports for flexible connectivity to SCADA, field devices and remote control systems.

Device Specifications	
Supply Voltage Range	18 - 36 V_{DC}
Nominal Supply Voltage	24 V_{DC}
CPU	ARM 926 EJ-S 32 Bit 454 Mhz
Flash	32 mB
RAM	64 mB
Watchdog Timer	System Reset / 5 sec
Power Consumption	8W @ 24 V
Real Time Clock	Available
Configuration	MCU+
Data Logging	Yes
Storage	8 mB (Up to 32 GB with SD Card)
Over The Air	Available
Ethernet Specifications	
Data Rates	10 / 100 Mbps
Number of Connections	2
Interface	Ethernet (RJ-45)
DHCP Support	Compatible
Ping Blocking	Yes
Wi-Fi Specifications	
Wi-Fi Protocols	802.11 b/g/n
Frequency Range	2.4 GHz ~ 2.5 GHz (2400M ~ 2483.5M)
RF Certification	SRRC, FCC, CE (RED), IC, NCC, KCC, TELEC (MIC)
Wi-Fi Certification	Wi-Fi Alliance
Wi-Fi Mode	Station / SoftAP / SoftAP + Station
Security	WPA / WPA2
Network Protocols	IPv4, TCP / UDP / HTTP / FTP

Bluetooth Specifications	
Bluetooth Radio	NZIF Receiver with -97 dBm sensivity
Bluetooth Protocols	Bluetooth v4.2 BR/EDR and BLE specification
Features	Class 1, 2 and 3 transmitter with Advanced Frequency Hopping
GSM Specifications	
Embedded GSM	Yes (Optional)
Operating Frequencies	Standard (Quad Band GSM module 850/900/1800/1900 MHz)
Number of Connections	2
GSM Antenna	824-960/1710-2170 MHz 3dbGSM Antenna
Stop Bit and Parity Bit Adjustment	Yes
Dispatch of warnings and alarms from software as text message to administrators possible	Yes
3G / 4G Connection	IPv4, TCP / UDP / HTTP / FTP
Communication Specifications	
Communication Protocols	Modbus-TCP (Master/Slave), Modbus-RTU (Master), IEC60870-5-104 (Server), IEC62056-21
IP Protocols	TCP / UDP / HTTP / HTTPS / FTP / SFTP / TFTP / NTP / SNTP / SSH / DHCP and IPSEC VPN
IOT Protocols	Secure MQTT
Serial Interfaces	2 x RS-485 (Isolated), Micro USB C Type 2.0
RS-485 BaudRate	1200bps – 115200bps
USB Data Transfer Speed	480 Mbit/s
IP Filter	Available
Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	35mm x 100mm x 115mm
Weight	250gr

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MCU++

Master Controller Unit
with Linux OS

Device Description

MCU++ series is an advanced compact industrial controller based on a 32-bit 454 MHz ARM CPU. With the power of Linux OS, the user can keep application development quick and simplified. MCU++ can take almost any role in remote utility applications such as solar power plants and electricity distribution substations. It combines GPRS/GSM modem, WiFi and Bluetooth, also digital inputs, outputs and datalogger in a single device. Device with built-in 2 digital inputs and outputs and has two ethernet and serial communication ports for flexible connectivity to SCADA, field devices and remote control systems.

Device Specifications	
Supply Voltage Range	18 - 36 V_{DC}
Nominal Supply Voltage	24 V_{DC}
CPU	ARM 926 EJ-S 32 Bit 454 Mhz
Flash	32 mB
RAM	64 mB
Watchdog Timer	System Reset / 5 sec
Power Consumption	8W @ 24 V
Real Time Clock	Available
Configuration	MCU+
Data Logging	Yes
Storage	8 mB (Up to 32 GB with SD Card)
Over The Air	Available
Ethernet Specifications	
Data Rates	10 / 100 Mbps
Number of Connections	5
Interface	Ethernet (RJ-45) x 2
DHCP Support	Compatible
Ping Blocking	Yes
Wi-Fi Specifications	
Wi-Fi Protocols	802.11 b/g/n
Frequency Range	2.4 GHz ~ 2.5 GHz (2400M ~ 2483.5M)
RF Certification	SRRC, FCC, CE (RED), IC, NCC, KCC, TELEC (MIC)
Wi-Fi Certification	Wi-Fi Alliance
Wi-Fi Mode	Station / SoftAP / SoftAP + Station
Security	WPA / WPA2
Network Protocols	IPv4, TCP / UDP / HTTP / FTP

Bluetooth Specifications	
Bluetooth Radio	NZIF Receiver with -97 dBm sensivity
Bluetooth Protocols	Bluetooth v4.2 BR/EDR and BLE specification
Features	Class 1, 2 and 3 transmitter with Advanced Frequency Hopping
GSM Specifications	
Embedded GSM	Yes (Optional)
Operating Frequencies	Standard (Quad Band GSM module 850/900/1800/1900 MHz)
Number of Connections	5
GSM Antenna	824-960/1710-2170 MHz 3dbGSM Antenna
Stop Bit and Parity Bit Adjustment	Yes
Dispatch of warnings and alarms from software as text message to administrators possible	Yes
3G / 4G Connection	IPv4, TCP / UDP / HTTP / FTP
Communication Specifications	
Communication Protocols	Modbus-TCP (Master/Slave), Modbus-RTU (Master), IEC60870-5-104 (Server), IEC62056-21
IP Protocols	TCP / UDP / HTTP / HTTPS / FTP / SFTP / TFTP / NTP / SNTP / SSH / DHCP and IPSEC VPN
IOT Protocols	Secure MQTT
Serial Interfaces	2 x RS-485 (Isolated), Micro USB 2.0
RS-485 BaudRate	1200bps – 115200bps
USB Data Transfer Speed	480 Mbit/s
IP Filtering & Routing	Available
Digital Input Specifications	
Number of Digital Input Channels	4
Input Channel Voltage Range	0 – 36 V_{DC} / 0 – 150 V_{DC} / 0 – 250 V_{AC} (Shoud be defined on order)
Input Channel Isolation	Available, Isolated with Optocoupler
Input Current	1.5 mA / Channel
Input Filter	Programmable, Default: 20ms
Input Change Counter	32 Bit
Digital Output Specifications	
Number of Digital Output Channels	2 (Type Dry-Contact)
Output Channel Voltage Range	0 – 36 V_{DC} (Shoud be defined on order)
Nominal Output Voltage	24 V_{DC} / 110 V_{DC} / 220 V_{AC}
Output Type	Dry-Contact Relay
Max. Output Current	2A
Load Type	Resistive, Inductive
Output Channel Isolation	Magnetically
Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-20°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	35mm x 100mm x 115mm
Weight	250gr

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SEM

Smart Energy Manager

Device Description

SEM is a compact and highly capable monitoring and control device for commercial, industrial and utility based energy management applications. It supports most of the common industrial communication protocols (Modbus, IEC104, IEC62056 etc.) as well as those being used for IoT applications (REST, MQTT, CoAP etc.). Owing to its embedded click-on communication board, you can choose any type of media over GSM, Wi-fi, Ethernet, Zigbee or Lora. SEM's power measurement feature provides monitoring of two three-phase circuits simultaneously with a sampling rate of 3.2kHz. Besides, it has an SD Card option up to 32GB to restore data even if there is a loss of communication. Its embedded and expandable digital inputs and outputs make it very easy to have more information from other communicable devices opening the door to a world of connectivity and control.

Device Specifications	
Supply Voltage Range	85 - 264 V_{AC}
Nominal Supply Voltage	230V_{AC}
CPU	ARM Cortex-M4 32 Bit 96 Mhz
Flash	1 MB
RAM	320 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	2.3W @ 230 V_{AC}
Real Time Clock	Available
Configuration	Web Server Interface / MCU-CX Configurator
Wi-Fi Specifications	
Wi-Fi Protocols	802.11 b/g/n
Frequency Range	2.4 GHz ~ 2.5 GHz (2400M ~ 2483.5M)
Wi-Fi Antenna	Extenal Antenna On board SMA Connector
RF Certification	SRRC, FCC, CE (RED), IC, NCC, KCC, TELEC (MIC)
Wi-Fi Certification	Wi-Fi Alliance
Wi-Fi Mode	Station / SoftAP / SoftAP + Station
Security	WPA / WPA2
Network Protocols	IPv4, TCP / UDP / HTTP / FTP

GSM Specifications	
Embedded GSM	Yes (Optional)
Operating Frequencies	Standard (Quad Band GSM module 850/900/1800/1900 MHz)
Number of Connections	6
GSM Antenna	On Board SMA Connector
Ping Blocking	Yes
Stop Bit and Parity Bit Adjustment	Yes
Identification With Phone Number	Yes
Dispatch of warnings and alarms from software as text message to administrators possible	Yes
3G / 4G Connection	Optional
Communication Specifications	
Communication Protocols	Modbus-RTU (Slave), IEC60870-5-104, IEC62056-21
Serial Interfaces	RS-485, Micro USB C Type 2.0
Serial Communication Speed	1200bps – 115200bps
USB Data Transfer Speed	480 Mbit/s
Power Measurement Specifications	
Voltage Measurement Range	0 - 275 $V_{AC,RMS}$ (L - N), 0 - 500 $V_{AC,RMS}$ (L - L)
Curren Measurement Range	1 - 4000 $A_{AC,RMS}$ (Split Type)
Frequency	50 / 60 Hz ±5%
Voltage Channels	3P + N (3 Phase Voltage and Neutral)
Current Channels	2 x 3P (Either 3 Phases or 6 Single Phases)
Sampling Frequency	128 Sample / Cycle
Voltage Accuracy	±0,5%
Current Accuracy	±0,5%
Active Energy Accuracy	IEC 62053-22 Class 0.5S
Accuracy Class	IEC 61000-4-30 Class S
Basic Measurements	V, I, f, P, Q, S / kWh, kVArh, kVAh (Four Quadrant) / PF, cos φ/ THD-I, TDD-I, THD-U, THD-V / K-Factor / Ih(1-13) - Vh(1-13)
Detailed Measurements	Outage / Maximum Voltage, Current and Power Demand
Programmable Alarms	Under Voltage / Over Voltage / Low Current / High Current
Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	35mm x 100mm x 115mm
Weight	190gr

PMU
Power Meter Unit

Device Description

Inavitas PMU (Power Meter Unit) is a new generation network analyzer that measures and enables real time monitoring of energy parameters. Inavitas PMU (Power Meter Unit) monitors up to 5 channel three phase circuits or 15 channel single phase circuits or any combination of single or three phase circuits. This flexibility makes Inavitas PMU perfect for multi-tenant facilities such as distribution substations, office buildings, data centers and shopping malls. The user can monitor all energy parameters in real time and configure current and voltage polarities, transformer ratios and serial communication settings easily via Inavitas PMU user interface software.

Device Specifications	
Supply Voltage Range	9-18 V_{DC} / 18-36 V_{DC}
Nominal Supply Voltage	12 V_{DC} / 24 V_{DC}
CPU	ARM Cortex-M4 32 Bit
Flash	128 kB
RAM	64 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	5W @ 24 V_{DC}
Real Time Clock	Available
Configuration	Inavitas PMU Configuration Software
Communication Specifications	
Communication Protocols	802.11 b/ Modbus-RTU (Slave) g/n
Serial Interfaces	RS-485 (Isolated), Micro USB C Type 2.0
Serial Communication Speed	1200bps – 115200bps
Connection Type	3-Wired (A, B, GND), Semi Duplex
Data Type	8 Bit Data, No Parity, 1 Bit Stop
Insulation	2.5 kV_{AC}, RMS 1 Minute
Usb Data Transfer Speed	480 Mbit/s

Power Measurement Specifications	
Voltage Measurement Range	0 - 275 $V_{AC,RMS}$ (L - N), 0 - 500 $V_{AC,RMS}$ (L - L)
Current Measurement Range	1 - 4000 $A_{AC,RMS}$ (Split Type)
Frequency	50 / 60 Hz ±5%
Voltage Channels	3P + N (3 Phase Voltage and Neutral)
Current Channels	5 x 3P (Either 15 Phases or 6 Single Phases)
Sampling Frequency	128 Sample / Cycle
Voltage Accuracy	±0,5%
Current Accuracy	±0,5%
Active Energy Accuracy	IEC 62053-22 Class 0.5S
Accuracy Class	IEC 61000-4-30 Class S
Detailed Measurements	Outage / Maximum Voltage, Current and Power Demand
Programmable Alarms	Under Voltage / Over Voltage / Low Current / High Current
Environment Conditions	
Operating Temperature	-25°C / +85°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	35mm x 100mm x 115mm
Weight	230gr

VTU

Voltage Tracking Unit

Device Description

VTU (Voltage Tracking Unit) is a generation digital input module that provides voltage tracking in single phase or three phase systems. Digital input module has network analyzer specification that provides 4 channel voltage and 3 channel current input on device. In addition to network analyzer and voltage tracking, VTU provides to monitoring of energy parameters of single phase or three phase information that connects.

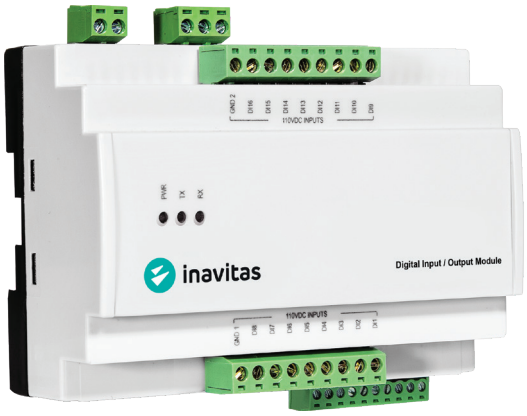
Logical 1 and 0 informations can be set with VTU Configuration Software which voltage range will work. At the same time, power parameter may also be observed which is calculated as real time.

Device Specifications	
Supply Voltage Range	9-18 V_{DC} / 18-36 V_{DC}
Nominal Supply Voltage	12 V_{DC} / 24 V_{DC}
CPU	ARM Cortex-M4 32 Bit
Flash	256 kB
RAM	32 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	1.5W @ 24 V_{DC}
Real Time Clock	Available
Configuration	Inavitas VTU Configuration Software
Communication Specifications	
Communication Protocols	Modbus-RTU (Slave) g/n
Serial Interfaces	RS-485 (Isolated), Micro USB Type 2.0
Serial Communication Speed	1200bps – 115200bps
Connection Type	3-Wired (A, B, GND), Semi Duplex
Data Type	8 Bit Data, No Parity, 1 Bit Stop
Insulation	2.5 kV_{AC} RMS 1 Minute
Usb Data Transfer Speed	480 Mbit/s

Digital Input Specifications	
Voltage Measurement Range	0 - 275 $V_{AC,RMS}$
Number of Digital Channels	18 Voltage Inputs
Logical "1" Value	Programmable, Default : ≥ 150$V_{AC,RMS}$ ≤ 275 $V_{AC,RMS}$
Logical "0" Value	Programmable, Default : ≤ 150$V_{AC,RMS}$
Input Current	1.5 mA / Channel
Input Filter	Programmable, Default : 100ms
Input Change Counter	32 Bit
Power Measurement Specifications	
Voltage Measurement Range	0 - 275 $V_{AC,RMS}$ (L - N), 0 - 500 $V_{AC,RMS}$ (L - L)
Current Measurement Range	1 - 4000 $A_{AC,RMS}$ (Split Type)
Frequency	50 / 60 Hz ±5%
Voltage Channels	3P + N (3 Phase Voltage and Neutral)
Current Channels	3 Current Inputs
Sampling Frequency	128 Sample / Cycle
Voltage Accuracy	±0,5%
Current Accuracy	±1%
Active Energy Accuracy	IEC 62053-22 Class 0.5S
Accuracy Class	IEC 61000-4-30 Class S
Environment Conditions	
Operating Temperature	-25°C / +85°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	35mm x 100mm x 115mm
Weight	150gr

DIO

Digital Input / Output



Device Description

DIO (Digital Input/Output) Module can display on/off or 1/0 data for up to 16 channels. Input channels with high impedance reduce the input current and noise immunity is increased through hysteresis. The device has a anti-jumping filter to prevent contact from jumping. The device also has 32 bit change registers and these registers display the level changes in the input channels. DIO (Digital Input/Output) has 8 channels of isolated solid state relay output. Output channels are isolated from each other. The output type can be changed to latch or unlatch output with the specified time.

The user can configure input polarities, anti-jumper filter time, serial communication port settings and output latch time easily through DIO user interface. User can also turn the "Test Mode" on the module. All the inputs and outputs are adjustable for site tests in the "Test Mode".

Device Specifications	
Supply Voltage Range	18-36 V_{DC}
Nominal Supply Voltage	24V_{DC}
CPU	ARM Cortex-M4 32 Bit 84 MHz
Flash	256 kB
RAM	32 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	< 1 W @ 24V_{DC}
Real-Time Clock	Available
Communication Specifications	
Communication Protocols	Modbus-RTU
Serial Interfaces	Isolated RS-485
Serial Communication Speed	12000bps – 115200bps
Connection Type	3 wired (A, B, GND), Half Dublex
Data Type	8 bit data, No parity, 1 bit stop
Isolation	2.5 kVAC, rms, 1 minute
USB Connector	Micro Usb

Digital Input Specifications	
Number of Digital Input Channels	16
Input Channel Voltage Range	0 – 36 V_{DC} / 0 – 150 V_{DC} (Shoud be defined on order)
Input Channel Isolation	Available, Isolated with Optocoupler
Input Current	1.5 mA / Channel
Input Filter	Programmable, Default: 20ms
Input Change Counter	32 Bit
Digital Output Specifications	
Number of Digital Output Channels	8 (Type Dry-Contact)
Output Channel Voltage Range	0 – 36 V_{DC} or 0-250 V_{AC}
Nominal Output Voltage	24 V_{DC} / 110 V_{DC} / 220 V_{AC}
Output Type	Dry-Contact Relay
Max. Output Current	50 mA / Channel
Load Type	Resistive, Inductive
Output Channel Isolation	Available, Isolated with Optocoupler
Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	113.4 mm x 126 mm x 56.9 mm
Weight	250gr

Mini DIO

Digital Input / Output

Device Description

Mini DIO (Digital Input/Output) Module can display on/off or 1/0 data for up to 4 channels. Input channels with high impedance reduce the input current and noise immunity is increased through hysteresis. The device has a anti-jumping filter to prevent contact from jumping. The device also has 32 bit change registers and these registers display the level changes in the input channels.

Mini DIO (Digital Input/Output) has 3 channels of isolated solid state relay output. Output channels are isolated from each other. The output type can be changed to latch or unlatch output with the specified time.

The user can configure input polarities, anti-jumper filter time, serial communication port settings and output latch time easily through Mini DIO user interface. User can also turn the "Test Mode" on the module. All the inputs and outputs are adjustable for site tests in the "Test Mode".

Device Specifications	
Supply Voltage Range	85 - 264 V_{AC} or 17-36 V_{DC}
Nominal Supply Voltage	230V_{AC} or 24V_{DC}
CPU	ARM Cortex-M0 32 Bit 48 Mhz
Flash	128 kB
RAM	16 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	0,5 w
Communication Specifications	
Communication Protocols	Modbus-RTU (Slave), IEC60870-5-104, IEC62056-21
Serial Interfaces	RS-485, Micro
Serial Communication Speed	1200bps – 115200bps

Digital Input Specifications	
Number of Digital Input Channels	4
Input Channel Voltage Range	0 – 36 V_{DC} / 0 – 150 V_{DC} (Shoud be defined on order)
Input Channel Isolation	Available, Isolated with Optocoupler
Input Current	1.5 mA / Channel
Input Filter	Programmable, Default: 20ms
Input Change Counter	32 Bit
Digital Output Specifications	
Number of Digital Output Channels	3 (Type Dry-Contact)
Output Channel Voltage Range	0 – 36 V_{DC} or 0-250 V_{AC}
Nominal Output Voltage	24 V_{DC} / 110 V_{DC} / 220 V_{AC}
Output Type	Dry-Contact Relay
Max. Output Current	5A
Load Type	Resistive, Inductive
Output Channel Isolation	Magnetically
Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	35mm x 100mm x 115mm
Weight	250gr

ESU 101

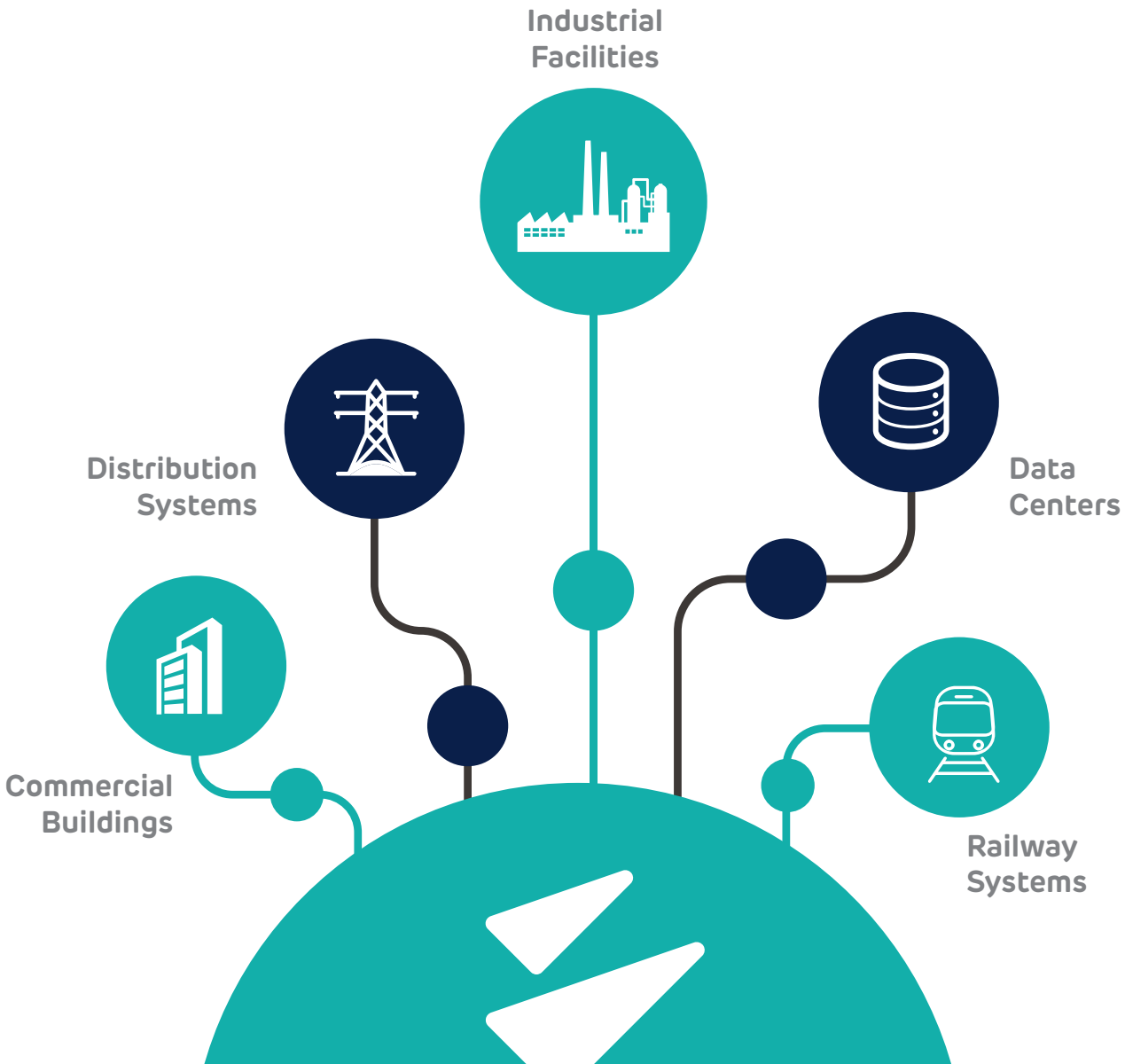
Environmental Sensor Unit

Device Description

ESU 101 is s cost-effective environmental sensor which is also equipped with Infra Red (IR) controller for split-type Air Conditioners. Thanks to its flexible design, ESU 101 has a learning mode which enables the device to be used with almost all split-type ACs. It has an RS-485 interface supporting Modbus/RTU protocol for SCADA applications.

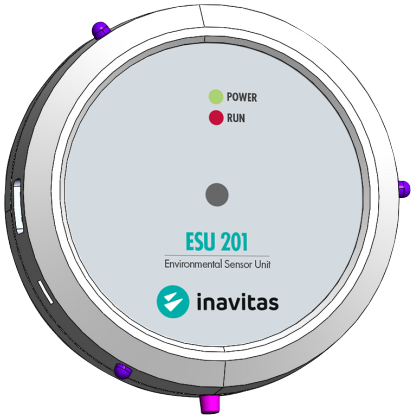
Device Specifications	
Supply Voltage Range	9-18/18-36 V_{DC} or 85 ~ 264 V_{AC}
Nominal Supply Voltage	12 / 24 V_{DC} or 230 V_{AC}
CPU	ARM Cortex-M4 32 Bit 180 Mhz
Flash	256 kB
RAM	128 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	0.46W 230V_{AC}
Internal Temperature Sensor	Temperature Range: -20 to 120 °C
Internal Humidity Sensor	Humidity Range: 0 to 100% RH
Infrared Transmitter Output Power	160mW
Infrared Transmitter Output Wavelength	940nm
Infrared Transmitter Carrier Frequency	38kHz
Infrared Receiver Input Frequency	38kHz
Relay Output Contact Current Rating	10A
Relay Output Maximum Switching Voltage	250VAC
Relay Contact Form	SPDT (1 Form C)
Wi-Fi Specifications	
Wi-Fi Protocols	802.11 b/g/n
Frequency Range	2.4 GHz ~ 2.5 GHz (2400M ~ 2483.5M)
RF Certification	SRRC, FCC, CE (RED), IC, NCC, KCC, TELEC (MIC)
Wi-Fi Certification	Wi-Fi Alliance
Wi-Fi Mode	Station / SoftAP / SoftAP + Station
Security	WPA / WPA2
Network Protocols	IPv4, TCP / UDP / HTTP / FTP

Communication Specifications	
Communication Protocols	Modbus-RTU (Slave)
Serial Interfaces	1 x RS-485, Micro USB C Type 2.0
RS-485 BaudRate	1200bps – 115200bps
USB Data Transfer Speed	480 Mbit/s
Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	115mm x 83mm x 32 mm
Weight	100gr



ESU 201

Environmental Sensor Unit



Device Description

ESU 201 is an advanced environmental sensor which is also equipped with Infra Red (IR) controller for split-type Air Conditioners. Thanks to its flexible design, ESU 201 has a learning mode which enables the device to be used with almost all split-type ACs. In addition, it has low power bluetooth communication protocol, therefore it can be controlled via any device that has bluetooth technology.

Device Specifications	
Nominal Supply Voltage	USB or $5V_{DC}$ Power Jack or AAA Size battery
CPU	ARM Cortex-M4 32 Bit 64 Mhz
Flash	512 kB
RAM	64 kB
Watchdog Timer	System Reset / 5 sec
Power Consumption	0.04W $5V_{DC}$
Internal Temperature Sensor	Temperature Range: -20 to 120 °C
Internal Humidity Sensor	Humidity Range: 0 to 100% RH
Infrared Transmitter Output Power	160mW
Internal Carbon Dioxide Sensor	0-5000 ppm %3 Accuracy
Infrared Transmitter Output Wavelength	940nm
Infrared Transmitter Carrier Frequency	38kHz
Infrared Receiver Input Frequency	38kHz
Bluetooth Specifications	
Bluetooth Protocols	BLE v5.0
Frequency Range	2.4 GHz
RF Certification	SRRC, FCC, CE (RED), IC, NCC, KCC, TELEC (MIC)
Bluethooth MESH Support	Yes

Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	115mm x 83mm x 32 mm
Weight	100gr

PSU AC105

Power Supply Unit

Device Description

PS can be used with all inavitas' IOT devices. It has 85-265VAC 50/60 Hz input and 5V, 2A output. Its output can be adjusted by its pot type resistor. Thanks to its small footprint, it can be used in space-limited applications.

Device Specifications	
Output DC Voltage	5V
Output Rated Current	2A
Output Current Range	0-2A
Output Ripple & Noise (Max)	100mV
Output Voltage Adjustable Range	4.5 -6.0 V
Input Voltage Range	85-264 VAC
Input Frequency Range	50-64 Hz
Input Efficiency	% 82
Protection Overload	110-140% Rated Output Power. Protection type: Constant current limiting recovers automatically after fault condition is removed.
Working temperature	-30 ~ +70 (Refer to output maximum load)
Working humidity	20 ~ 90% Rh
Storage temperature humidity	-40 ~ +85 , 10 ~ 95% Rh
Safety standards	UI508, tuv en60950-1 approved
Emi conduction & radiation	Compliance to en55011,en55022 (cispr22), en61204-3 class b
Harmonic current	Compliance to en61000-3-2,-3
Ems immunity	Compliance to en61000-4-2, 3, 4, 5, 6, 8, 11, env50204, en55024,en61000-6-1,en61204-3 light industry level, criteria a
Environment Conditions	
Standards	IEC 61326-1, EN 301489-1, IEC 61010-1, EN 60950-1
Operating Temperature	-25°C / +70°C
Storage Temperature	-40°C / +70°C
Operating Humidty	25% - 95% RH
Protection Class	IP20
Mechanical Specifications	
Device Dimensions (W x H x D)	35mm x 90mm x 59 mm
Weight	70gr


PWR
RX1
TX1
RX2
TX2
ERR
GSM
TX
IN1
IN2
IN3
IN4
OUT1
OUT2
MCU
Master Controller Unit
inavitas
PWR
RX
TX
PMU
Power Meter Unit
USB
inavitas
PWR
RUN
RX
TX
GST
WST
SEM
Smart Energy Manager
USB
5V DC
NO COM NC
24V DC
inavitas
ESU 101
Environmental Sensor Unit
RUN RLY WST RX TX PWR
RS485
A B GND
230V AC
inavitas
PSU AC10S
Power Supply Unit
10W
5V DC

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