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SMART COMMUNICATION

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HUR Series Multi Slot Modbus TCP Remote I/O Devices with I/O Logic Functions, MQTT Publisher and LoRaWAN Connectivity

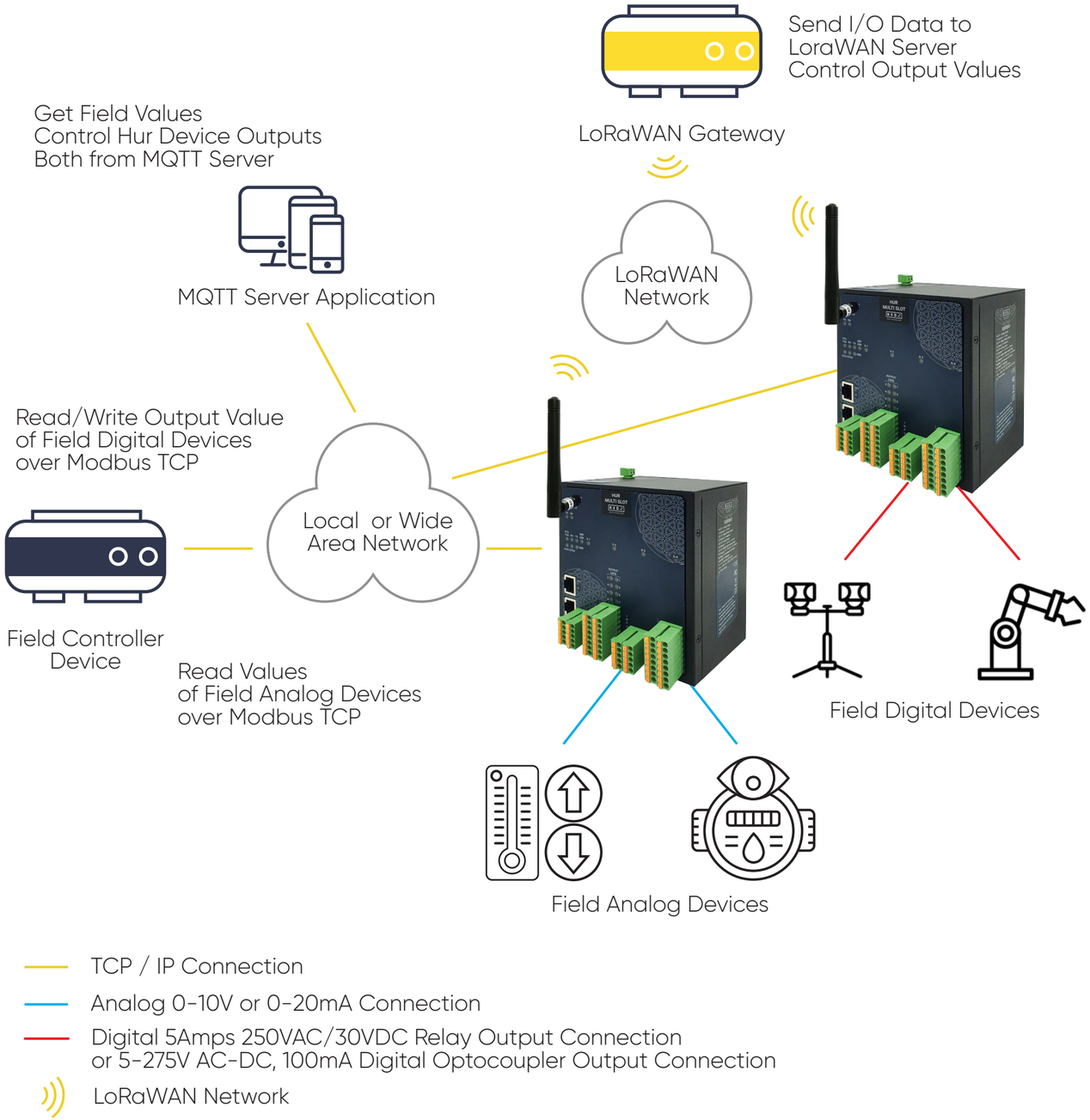
Different I/O Options on Each Slot
and 2 x 10/100Base-T(x) Ports

HUR Series Modbus TCP Remote I/O Devices offers different I/O combinations, which provide greater flexibility and are compatible with many different applications that makes them the perfect choice for establishing a cost-effective remote I/O system with I/O Logic Functions.

Multi Slot versions of HUR Series Modbus TCP Remote Input/Output (I/O) Devices support up to 32 I/O. A combination of Analog Input, Digital Input, Analog Output or Digital Output can be selected for each slot. All I/O data can be read via Modbus TCP and can be sent to MQTT Server in same time. I/O data can also be controlled through MQTT Server via commands for output models. Output versions also support I/O Mirror function which is copying an input of in 1 HUR device to Output on 1 or more HUR devices.

LoRaWAN versions of Multi Slot HUR Series Modbus TCP Remote Input/Output (I/O) Devices adds LoRaWAN connectivity on top of all features that HUR Multi versions support. Up to 32 I/O can be read/controlled via Modbus TCP protocol, I/O data can be sent to MQTT Server and I/O data can be sent to LoRaWAN Server and all takes place simultaneously. LoRaWAN Downlink messages are also supported and it can be used to send Custom Modbus Commands remotely to control Output Models.

All versions of HUR Series Modbus TCP Remote Input/Output (I/O) Devices support I/O Logic Functions which can be used to make field automation by using HUR Series itself in the field. As an example, device can be programmed to Turn ON Output or send status of input values to MQTT server or LoRaWAN Server when an input dedected. There are many combinations available.



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Main Features

- Supports 2 x 10/100Base-T(X) ports
- Supports Full/Half-Duplex, auto MDI/MDI-X on each port
- Embedded web interface for ease of use
- **2 different Operating Modes:**

Modbus TCP Remote I/O Device with MQTT Publisher in Server Mode

Modbus TCP Remote I/O Device as a slave Device in Client Mode and Supports I/O Mirror for Output Devices

- **MQTT Publisher with different data transfer options**

OBIS Values as Data Objects

OBIS Values as Modbus Frame

- **HUR can send Data to MQTT Server and MQTT Server can remotely control Output Versions of HUR Devices in the same time**
- **Logic Function commands available to make field automation based on I/O status**
- Up to 10 client connection in Server Mode
- DHCP Server Capability
- Easy to follow Device Status and Modbus Packages on web interface
- Device Address changeable via web interface
- Easy to follow Device Parameters such as Device Up Time, Modbus read counter etc. on web interface
- Black List and White List based IP Filter in TCP Server Mode
- Firmware Upgrade over Web
- 2 firmware storage capability on same device (1 active only)
- AC or DC wide range power options
- Wide operating temperature range from -25 to 70 °C AC and -40 to 85 °C DC power input versions
- Rugged Metal IP-40 housing design
- DIN-Rail mounting

Extra Features for Output Models

- Output configuration can be defined by user for restart
- Output values can be saved and applied during auto restart
- I/O Mirror functionality: Device can duplicate output from a Modbus input device

LoRaWAN Features

- **Radio Band Options:**

868MHz

EU 868 MHz – Europe, LoRaWAN RF Communication

- **LoRaWAN data send interval configurable**
- **Downlink Messages are supported for remote control of Output Models**
- **Built in LoRaWAN Duty Cycle Check**
- **Activation Over Air (OTAA) or Activation by Personalization (ABP) Selectable**
- **User defined LoRAWAN Port**
- Adaptive Data Rate functionality
- Selectable Uplink Data Rate
- Selectable Power Level
- LoRaWAN Class C and Class A support
- Easy to follow Device Status on web interface
- Easy to follow LoRaWAN packages on web interface

Technical Specifications

LoRa TECHNOLOGY

Based on	STM32L151CxU6Axx Pre-Certified according to EN 300 220
Sensitivity	Down to -138 dBm
Link Budget	Up to 156 dB
Communication Distance	Up to 15 km (Line of Sight)
Typical Communication Distance Indoor/Urban	> 2 km
LoRaWAN Activation Options	Activation Over Air (OTAA) Activation by Personalization (ABP) User Selectable
LoRaWAN Port	User Selectable
Adaptive Data Rate	Available
LoraWAN Class	Class A Class C
Tx Power Level	0 to 16dBm Configurable
Sent Data	Sends Status Message and I/O Status
Time Synchronization	TLM synchronizes its time with LoRaWAN Server right after it is connected to LoRaWAN Server
Uplink Data Rate	SF12 / 125 kHz / 250 bps SF11 / 125 kHz / 440 bps SF10 / 125 kHz / 980 bps SF9 / 125 kHz / 1760 bps SF8 / 125 kHz / 3125 bps SF7 / 125 kHz / 5470 bps SF7 / 250 kHz / 11000 bps FSK 50k / NA / 50000 bps

LoRaWAN DOWNLINK CHARACTERISTICS

Downlink Messages	Modbus RTU Commands are supported as Downlink Messages to Control Output Models. CRC bytes (2 bytes) are ignored by HUR device and user can send/downlink Modbus RTU commands without CRC Bytes

ETHERNET SWITCH TECHNOLOGY

Ethernet Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-T(X) IEEE 802.3x Flow Control
Mac Table	1K MAC address entry
Processing	Store-and-Forward
Memory	448K bits packet buffer memory

NTP TIME SYNCHRONIZATION

NTP is used to syncronize device time after a manual or system triggered restart and it only takes place if NTP time is available and device time difference from NTP time is + or - 24 Hours.

Device synchronize time with LoRaWAN Server as well after first succesfull connection and it has higher priority than NTP time synchronization.

I/O LOGIC FUNCTIONS

All versions of HUR Series Modbus TCP Remote Input/Output (I/O) Devices support I/O Logic Functions which can be used to make field automation by using HUR Series itself in the field. As an example, device can be programmed to Turn ON Output or send status of input values to MQTT server or LoRaWAN Server when an input dedected. There are many combinations available.

I/O Logic Commands	• Up to 16 commands available
Condition Slot and I/O	• HUR can check programmed input or output of selected slot. This can be any of the available slot (Analog Input, Digital Input, Analog Output or Digital Output)
Condition Command	• For Analog Input and Analog Output: HUR can check if the selected I/O value is Higher or Lower than user specified value • For Digital Input and Digital Output: HUR can check if the selected I/O value is ON, OFF or its State Changed (from ON to OFF or OFF to ON)
Condition Duration	• HUR can check the command for user defined duration and function is only triggered when command is true for specified duration
Result Slot and I/O	• This is the affected input or output number of slot for triggered command. This can be any of the available slot (Analog Input, Digital Input, Analog Output or Digital Output)
Result Command	• For Digital Output and Analog Output: HUR can set output to specific value. It can be On, Off or State Change for Digital Output model and can be user defined value for Analog Output Model • For All Slot Models: HUR can send MQTT message or LoRaWAN message for specified slot when command is triggered
Wait Before Next Check	• Once the command is triggered, HUR can wait for next check of command based on user defined duration
Examples	• HUR can send MQTT message for selected slot if an Analog Input Value is Higher than 10mA. • HUR can send LoRaWAN message for selected slot if an Analog Input Value is Lower than 10mA. • HUR can set Output On for selected Digital Output slot if a Digital Input value is OFF

MODBUS TCP CHARACTERISTICS

Modbus Protocol	• Modbus TCP
Modbus Address	• Default value is 0x01 • Changeable via Web Interface
Monitoring Parameters	• Modbus Read counter • Time counter (in seconds) • FW version • Device Up Time • Serial and TCP packages

EXTRA FEATURES FOR OUTPUT MODELS

Save Output Values Before Auto Restart	• Default enabled and when system auto restarts the values are saved and applied after restart • Changeable via Web Interface
Save Output Values and Apply on Power Up	• Default disabled, user can activate and enter parameters for each output individually • Changeable via Web Interface
I/O Mirror Functionality	• Default disabled • If enabled, device can read input value of remote HUR device and duplicate those values as output

CONNECTORS AND PORTS

SMA Antenna Connector For LoRa	1 Standard SMA female interface, 50 Ohm
Console Port	Micro USB or USB Type-C connection for LOG in 115200 baud
10/100T(X) RJ45 Ports	Ethernet Connection on 2 ports
Reset Buttons	Reset to Client and Reset to Server Operating modes buttons

LED INDICATORS

Power Indicator	Power LED
10/100T(X) Indicators	Activity LEDs: ETH1, ETH2 and HUR (Activity of device itself)
System Indicators	Status LED, Tx and Rx of data LEDs and Server LED (LED ON: Server Operating Mode, LED OFF: Client Operating Mode)
System LED	Flashes during normal operation of I/O module
Slot LEDs	S-1, S-2, S-3 and S-4: Turns On for 1 second and Turns OFF for 1 second under normal operation of I/O Interface. Each LED corresponds to related I/O Slot.
Console Indicators	Tx and Rx of data LEDs

I/O CONNECTORS AND INDICATORS - HUR1711 & HUR1811

I/O Connector	• Terminal Connectors Digital Outputs: 4 Slots x 8 Channel Output Terminals, polarity is not important. Total 16 connection pins for each slot. • 5-275V AC-DC, 100mA Digital Optocoupler Outputs
Isolation	• Digital Optocoupler Output: 3750 Vrms for 1 min
Over Voltage Protection	• Digital Optocoupler Output: 275V • Non-repetitive peak on-state pulse current: 80A
Output Status LEDs	• Shows which pin is ON and OFF for Digital Output versions.

I/O CONNECTORS AND INDICATORS - HUR1712 & HUR1812

I/O Connector	• Terminal Connectors Digital Outputs: 4 Slots x 8 Channel 5Amps 250VAC/30VDC Digital Relay Output 8 Channel Output terminals and polarity is not important. 2 pins for each connection and total 16 connection pins. Maximum 5 Amperes 250VAC/30VDC for each channel.
Dielectric Strength	• 3kV dielectric strength (between coil and contacts) Meets IEC61131-2 reinforce insulation
Output Status LEDs	• Shows which pin is ON and OFF for Digital Output versions.

I/O CONNECTORS AND INDICATORS - HUR1713 & HUR1813

I/O Connector

- Terminal Connectors

  Digital Inputs: 4 Slots x 8 Channel 12-275V AC-DC, 60mA Digital Optocoupler Input

  8 Channel Input terminals and polarity is not important. 2 pins for each connection and total 16 connection pins for each slot.

Isolation

- Digital Optocoupler Input:

  4470Vrms 1min

Over Voltage Protection

- Digital Optocoupler Input:

  275V

I/O CONNECTORS AND INDICATORS - HUR1714 & HUR1814

I/O Connector

- Terminal Connectors

  Analog Inputs: 4 Slots x 8 Channel 0-20mA Analog Input

  Polarity is important and all inputs references to Common point.

  2 Common points 8 Analog Inputs total 10 connection pins for each slot.

  0-10V and 0-20mA Selectable during order (default is 0-20mA) Analog Input

Analog Input Features

- 16-bit resolution with no missing codes

  Throughput: 250 kSPS

I/O CONNECTORS AND INDICATORS - HUR1715 & HUR1815

I/O Connector

- Terminal Connectors

  Analog Outputs: 4 Slots x 5 Channel 4-20mA Analog Output

  5 Analog Outputs total 10 connection pins for each slot.

  4-20mA Analog Output designed for 24V 250ohm load or 12V 125ohm load.

Over Voltage Protection

- Analog Output: 40V

I/O CONNECTORS AND INDICATORS - HUR1721 & HUR1821

I/O Connector
SLOT 1
SLOT 2

- Terminal Connectors

  Digital Outputs: 2 Slots x 8 Channel Input Terminals, polarity is not important.
  Total 16 connection pins for each slot.

- 5-275V AC-DC, 100mA Digital Optocoupler Outputs

I/O Connector
SLOT 3
SLOT 4

- Terminal Connectors

  Digital Inputs: 2 Slots x 8 Channel 12-275V AC-DC, 60mA Digital Optocoupler Input

  8 Channel Input terminals and polarity is not important. 2 pins for each connection and total 16 connection pins for each slot.

I/O CONNECTORS AND INDICATORS - HUR1722 & HUR1822

I/O Connector
SLOT 1
SLOT 2

- Terminal Connectors

  Digital Outputs: 2 Slots x 8 Channel 5Amps 250VAC/30VDC Digital Relay Output

  8 Channel Output terminals and polarity is not important. 2 pins for each connection and total 16 connection pins for each slot.

I/O Connector
SLOT 3
SLOT 4

- Terminal Connectors

  Digital Inputs: 2 Slots x 8 Channel 12-275V AC-DC, 60mA Digital Optocoupler Input

  8 Channel Input terminals and polarity is not important. 2 pins for each connection and total 16 connection pins for each slot.

I/O CONNECTORS AND INDICATORS - HUR1725 & HUR1825

I/O Connector
SLOT 1
SLOT 2

- Terminal Connectors

  Analog Outputs: 2 Slots x 5 Channel 4-20mA Analog Output

  5 Analog Outputs total 10 connection pins for each slot.

  4-20mA Analog Output designed for 24V 250ohm load or 12V 125ohm load.

I/O Connector
SLOT 3
SLOT 4

- Terminal Connectors

  Analog Inputs: 2 Slots x 8 Channel 0-20mA Analog Input. Polarity is important and all inputs references to Common point. 2 Common points 8 Analog Inputs total 10 connection pins for each slot. 0-10V and 0-20mA Selectable during order.

I/O CONNECTORS AND INDICATORS - HUR1741 & HUR1841

I/O Connector SLOT 1

- Terminal Connectors

  Analog Outputs: 1 Slot x 5 Channel 4-20mA Analog Output

  5 Analog Outputs total 10 connection pins.

  4-20mA Analog Output designed for 24V 250ohm load or 12V 125ohm load.

I/O Connector SLOT 2

- Terminal Connectors

  Digital Outputs: 1 Slot x 8 Channel 5Amps 250VAC/30VDC Digital Relay Output

  8 Channel Output terminals and polarity is not important. 2 pins for each connection and total 16 connection pins.

I/O Connector SLOT 3

- Terminal Connectors

  Analog Inputs: 1 Slot x 8 Channel 0-20mA Analog Input. Polarity is important and all inputs references to Common point. 2 Common points 8 Analog Inputs total 10 connection pins. 0-10V and 0-20mA Selectable during order.

I/O Connector SLOT 4

- Terminal Connectors

  Digital Inputs: 1 Slot x 8 Channel 12-275V AC-DC, 60mA Digital Optocoupler Input

  8 Channel Input terminals and polarity is not important. 2 pins for each connection and total 16 connection pins.

POWER - DC MODELS

Input Range	5-48V DC wide range power input (Allows up to 60 V DC)
Reverse Polarity Protection	Available
Thermal Shutdown and Current Limit Protection	Available

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS DC MODELS

Enclosure	Metal, IP 40
Dimensions	115 x 970 x 126 (w x d x h) mm
Weight	~700gr
Storage Temperature	-65 to 150 °C
Operating Temperature	-40 to 85 °C
Operating Humidity	5% to 95% Non-condensing

POWER - AC MODELS

Input Range	100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Input
Isolation	Fully Isolated >4200Vrms, 5mA 1 Min Insulation: Class II

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS AC MODELS

Enclosure	Metal, IP 40
Dimensions	115 x 970 x 126 (w x d x h) mm
Weight	~700gr
Storage Temperature	-40 to 105 °C
Operating Temperature	-25 to 70 °C
Operating Humidity	5% to 95% Non-condensing

Ordering Information

HUR1711: Multi Slot, 4 x 8 Channels 5-275V AC-DC, 100mA Digital Optocoupler Output Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1811: Multi Slot, 4 x 8 Channels 5-275V AC-DC, 100mA Digital Optocoupler Output Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

HUR1712: Multi Slot, 4 x 8 Channels Digital 5Amps 250VAC/30VDC Relay Output Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1812: Multi Slot, 4 x 8 Channels Digital 5Amps 250VAC/30VDC Relay Output Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

HUR1713: Multi Slot, 4 x 8 Channels 12-275 AC-DC, 60mA Digital Optocoupler Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1813: Multi Slot, 4 x 8 Channels 12-275 AC-DC, 60mA Digital Optocoupler Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

HUR1714: Multi Slot, 4 x 8 Channels 0-20mA Analog Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1814: Multi Slot, 4 x 8 Channels 0-20mA Analog Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

Ordering Information

HUR1715: Multi Slot, 4 x 5 Channels 4-20mA Analog Output Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1815: Multi Slot, 4 x 5 Channels 4-20mA Analog Output Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

HUR1721: Multi Slot, 2 x 8 Channels 5-275V AC-DC, 100mA Digital Optocoupler Output, 2 x 8 Channels 12-275 AC-DC, 60mA Digital Optocoupler Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1821: Multi Slot, 2 x 8 Channels 5-275V AC-DC, 100mA Digital Optocoupler Output, 2 x 8 Channels 12-275 AC-DC, 60mA Digital Optocoupler Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

HUR1722: Multi Slot, 2 x 8 Channels Digital 5Amps 250VAC/30VDC Relay Output, 2 x 8 Channels 12-275 AC-DC, 60mA Digital Optocoupler Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1822: Multi Slot, 2 x 8 Channels Digital 5Amps 250VAC/30VDC Relay Output, 2 x 8 Channels 12-275 AC-DC, 60mA Digital Optocoupler Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

Ordering Information

HUR1725: Multi Slot, 2 x 5 Channels 4-20mA Analog Output, 2 x 8 Channels 0-20mA Analog Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1825: Multi Slot, 2 x 5 Channels 4-20mA Analog Output, 2 x 8 Channels 0-20mA Analog Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

HUR1741: Multi Slot, 1 x 5 Channels 4-20mA Analog Output, 1 x 8 Channels Digital 5Amps 250VAC/30VDC Relay Output, 1 x 8 Channels 0-20mA Analog Input, 1 x 8 Channels 12-275 AC-DC, 60mA Digital Optocoupler Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 5-48V (max. 60V) DC Power Input

HUR1841: Multi Slot, 1 x 5 Channels 4-20mA Analog Output, 1 x 8 Channels Digital 5Amps 250VAC/30VDC Relay Output, 1 x 8 Channels 0-20mA Analog Input, 1 x 8 Channels 12-275 AC-DC, 60mA Digital Optocoupler Input Modbus TCP Remote IO Device with MQTT and 868MHZ LoRaWAN Connectivity, 100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input

PRODUCT SELECTION

Model	868MHz LoRaWAN Connectivity	I/O Logic Functions	5-48V (max. 60V) DC Power input	100 - 240V AC (120 – 370V DC), 50Hz to 60Hz AC Power Input	2 x 10/100 T(x) ETH ports	8 Channel 5-275V AC-DC, 100mA Digital Optocoupler Output	8 Channel Digital 5Amp. Relay Output	8 Channel 12-275 AC-DC, 60mA Digital Optocoupler Input	8 Channel 0-10V and 0-20mA Selectable Analog Input	5 Channel 4-20mA Analog Output
HUR1711	●	●	●		●	● (x4)				
HUR1811	●	●		●	●	● (x4)				
HUR1712	●	●	●		●		● (x4)			
HUR1812	●	●		●	●		● (x4)			
HUR1713	●	●	●		●			● (x4)		
HUR1813	●	●		●	●			● (x4)		
HUR1714	●	●	●		●				● (x4)	
HUR1814	●	●		●	●				● (x4)	
HUR1715	●	●	●		●					● (x4)
HUR1815	●	●		●	●					● (x4)
HUR1721	●	●	●		●	● (x2)		● (x2)		
HUR1821	●	●		●	●	● (x2)		● (x2)		
HUR1722	●	●	●		●		● (x2)	● (x2)		
HUR1822	●	●		●	●		● (x2)	● (x2)		
HUR1725	●	●	●		●				● (x2)	● (x2)
HUR1825	●	●		●	●				● (x2)	● (x2)
HUR1741	●	●	●		●		●	●	●	●
HUR1841	●	●		●	●		●	●	●	●