LoRa I/O Controller

LM200 I/O Tracking Controller

Complete LoRa Controller for Analog IO Tracking

The LM200/LC100 series utilizes the latest Low Power Wide Area (LPWA) technology to build Modbus/RTU communication for long-distance, wide-coverage, and low power consumption wireless IoT applications.

Multiple analog inputs and outputs are supported in LC100 series, such as voltage inputs and outputs, current inputs and outputs, PWM output and one RS-485 port for Modbus RTU slave. One LM200 can connect up to 250pcs LC100 LoRa end nodes for two-way communications where field site analog signals are sent from LC100 and mirrors to another LC100 by LM200. The LoRa wireless distance can reach up to 3-6KM distance depending on the environment.

The LM200/LC100 series offers great flexibility in wireless IoT applications, such as LED light control without cable , Analog signal reproduced at remote site to replace traditional wiring.

LoRa™ IO Tracking -40~75°C

Features & Benefits

Analog I/O Extension & Tracking by LoRa (LC144+LM200)

- Transparent /Reproduce Analog Signal by LoRa
- LM200 Polling Source LC100 specific Channel and Output to Target LC100 specific Channel
- Create /Edit Tracking Rule by Utility Tool
- Achieve 2-Sites Analog Tracking

V / V, V / A, A / A Auto I/O Tracking (LC144 + LM200)

- V / V Tracking – Local Input Voltage , Remote Output Voltage
- V / A Tracking – Local Input Voltage, Remote Output Current in V/A Ratio
- A / A Tracking – Local Input Current, Remote Output Current
- A / V Tracking – Local Input Current , Remote Output Voltage in A/V Ratio
- 20 I/O Rule Entries (Maximum)

Secured & Reliable Radio Communication

- ECHO & Re-Send Mechanism
- AES 128 Data Encryption

Windows© Configure Tools

- User-Friendly, Model Auto Detection
- Analog IO Parameter Read and Write
- On-Line Monitoring, Log File Download
- Micro-USB Interface

0~10V Input / Output (LC144)

- 2 Channels 0~10V High Impedance Input- Luminance Sensing
- 1 Channel 0~10V Open Drain Output, Dimmer Control

4~20mA Input / Output (LC144)

- 2 Channels Current Sensing, 0.3%High Accuracy
- 1 Channel Current Output, 0.3% High Accuracy

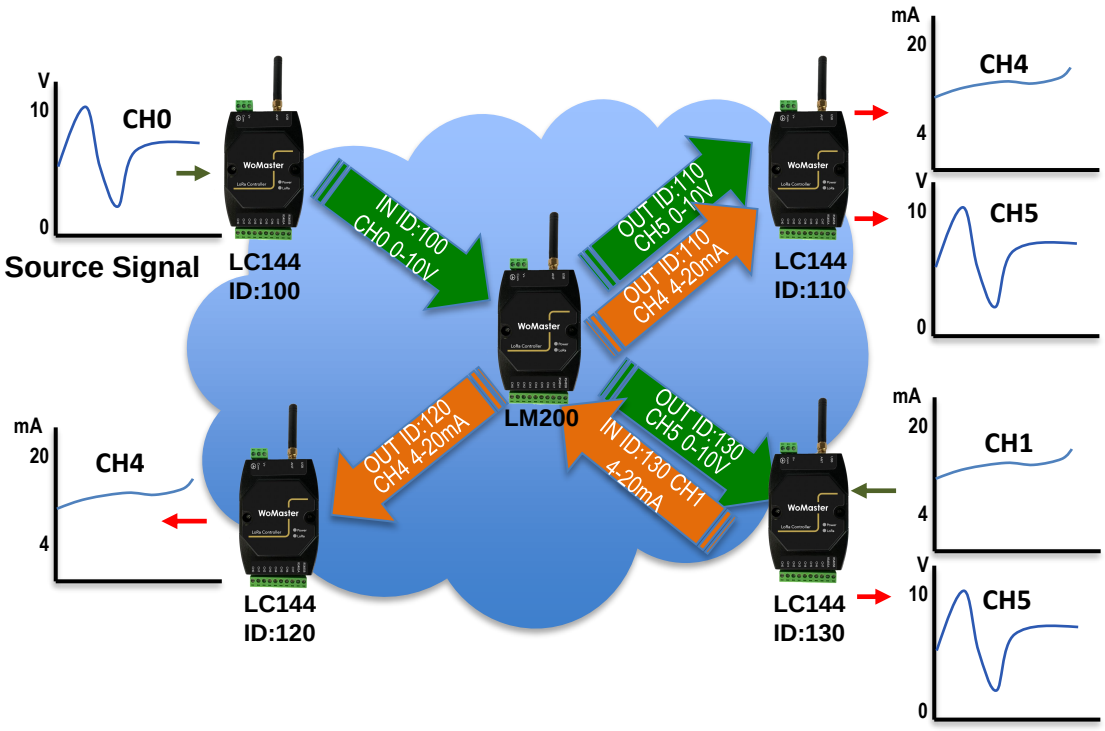
Event Log & Utility Monitoring (LM200)

- 1K Event Log Entries – Polling Fail, Remote Control Fail
- On-Line Monitoring by Utility

Industrial Application

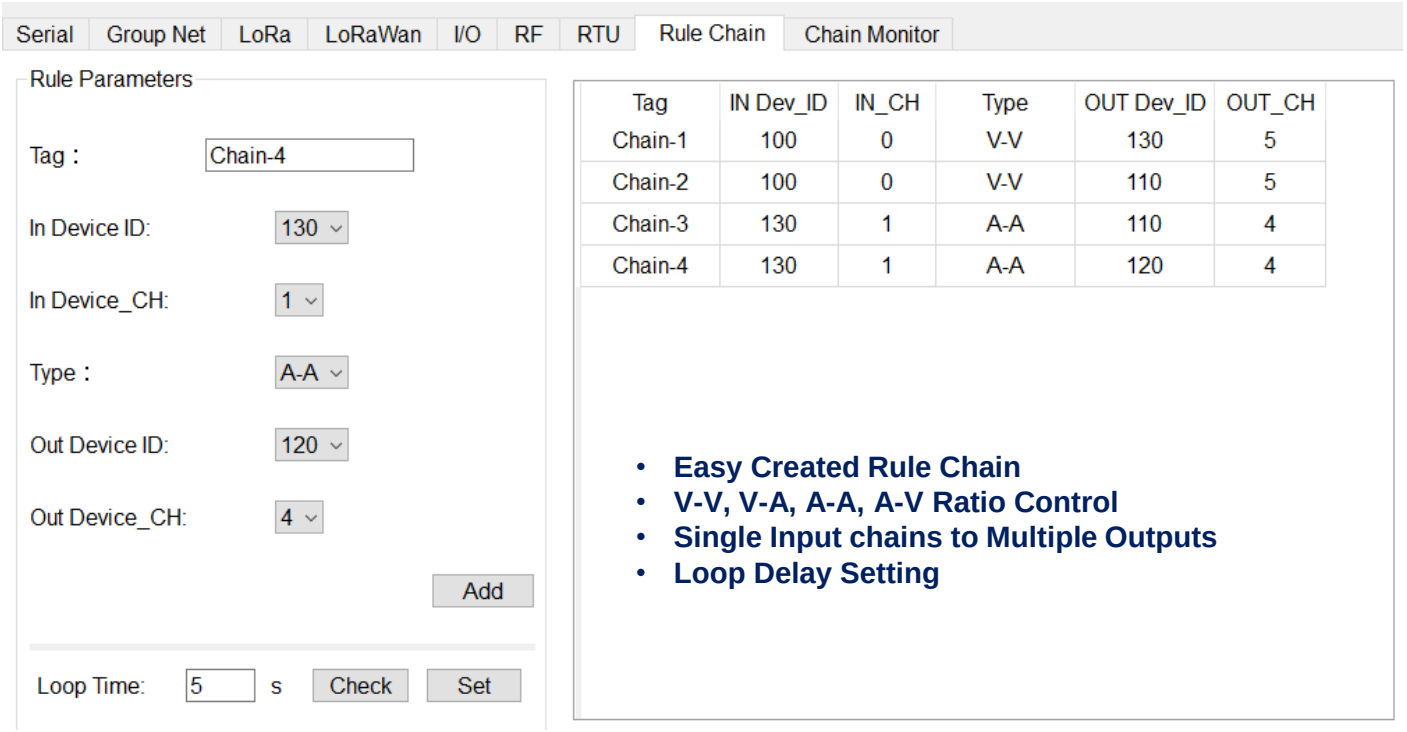
- 10~30V DC wide power range input
- Low Power Consumption
- Wide Coverage up to 6KM
- -40 ~ 75°C / 90%H Operating Temperature / Humidity
- Compliance IEC 61000-6-2/-6-4 Heavy Industrial EMC

✓ Transparent LoRa Communication – Analog I/O Tracking



Tag Name (Rule Name)	Tracking Rule - Input	Tracking Rule -Output
Chain-1	ID:100-CH0	ID:130-CH5
Chain-2	ID:100-CH0	ID:110-CH5
Chain-3	ID:130-CH1	ID:110-CH4
Chain-4	ID:130-CH1	ID:120-CH4

✓ User Friendly Utility to configure Analog IO parameters



- **Easy Created Rule Chain**
- **V-V, V-A, A-A, A-V Ratio Control**
- **Single Input chains to Multiple Outputs**
- **Loop Delay Setting**

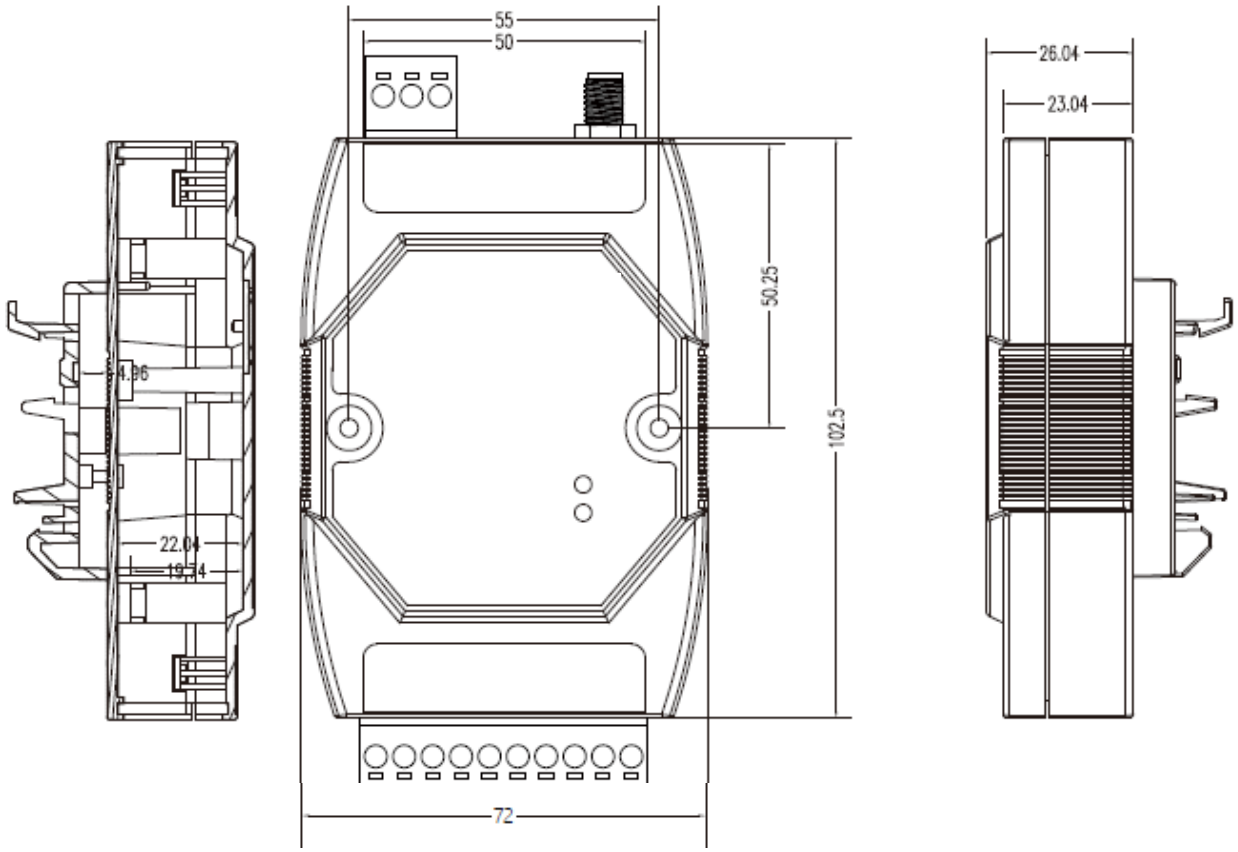
Interfaces

LC144

CH0	Input Voltage 0~10V Positive
CH1	Input Current 4~20mA Positive
CH2	Input Voltage 0~10V Positive
CH3	Input Current 4~20mA Positive
CH4	Output Current 4~20mA Positive
CH5	Output Voltage(OC) 0~10V Positive
CH6	Output PWM Voltage 0~5V Positive
CH7	Output PWM(OC) 0~10V Positive
RS485A	
RS485B	

Dimensions

(mm)



Specifications

Wireless Specification	
Frequency	-900 model : Frequency Support EU 868Mhz, US915Mhz, AS 923Mhz, KR 920Mhz -400 model : Frequency Support EU 433Mhz Frequency adjust by Utility
Wireless Technology	Low Power Wide Area – LoRa MAC Technology
Radio TX Power	22dBm
Radio RX Sensitivity	- 148dBm, SF=12 @ 250bps
Spreading Factor	SF5/SF6/SF7/SF8/SF9/SF10/SF12, Default SF7
Demodulator SNR	LoRa Demodulator Signal to Noise Ratio: -2.5dB ~ -20dB
Operating Mode	Modbus protocol over the Air (LoRa MAC Transparent Transmission) with configurable Echo time and retransmission technology LM200 supports Group I/O Tracking function, perform I/O Tracking between one pair of LC144
Forwarding Data Buffer	256Bytes FIFO Data Buffer for LoRa signal transmission
Data Encryption	128bits AES key , Utility configurable
Management	
System Management	1 x Micro USB 2.0 port for system configuration
Software Utility	Windows© Based Utility for parameters configuration, monitoring, log file download
Monitoring	On-Line Utility Monitoring
Event Log	1K Event Log Entries
Firmware Update	Firmware upgrade by upgrade tool or **Utility (To Be Available Soon)**
I/O Interface (LC144)	
Antenna Connector	1x 50 ohm, Female SMA
Serial Interface	2-wires RS-485 Terminal Connector with 1kv isolation Connector Type: Removable Terminal Connector Supported Model: LC-144(Host)
Serial Parameters	Baud Rate: 1200bps,2400bps, 4800bps, 9600bps Data Bits: 8 Parity Check: None, Even, Odd Stop Bit: 1,2
Current Input	2 Channels Detection Range: 4-20mA Accuracy Level: 0.3%
Voltage Input	2 Channels Detection Range: 0~10 V Accuracy Level: 0.2%
Current Output	1 Channel Output Range: 4-20mA @ Typical 24V Power Input Accuracy Level: 0.3%
Voltage Output	1 Channel Output Range: 0.03~10V Output Type: Open Collect (O.C.) Accuracy Level: 0.2%, Full Scale (F.S.)

PWM Output	Frequency: 100Hz~1KHz with 0.2% Duty-Cycle Accuracy Output Type-1: 5V, 200mA (Max) Output Type-2: Open Collect (O.C.), 10V /200mA (Max)
System Indication	
LED	Power (On): System Power applied LoRa (Blinking): LoRa RF Signal on Communication
Power Requirement	
Input Rating	Typical DC 24V, Rating: 10~30V 3-Pins Removable Terminal Connector for V+ ,Com and Earth Ground
Reverse Protection	Yes
Power Consumption	LM200: 1 Watt @ DC 24V power input LC144: 3 Watts @ DC 24V power input
Mechanical	
Installation	DIN Rail Mount
Enclosure Material	UL94v0, ABS , Anti- U/V
Ingress Protection	IP 40
Dimension	26(D) x 102.5 (H) x 72 mm (W) / with wall mounting clip
Weight	115g
Environmental	
Operating Temperature	-40°C~75°C, 0% ~ 90%, Non-Condensing
Storage Temperature	-40°C~80°C, 0% ~ 90%, Non-Condensing
Reliability & Warranty	
MTBF	>20000 Hours
Warranty	3 Years
Standards	
Radio Equipment Directive	RED 2014/53/EU EMC: EN 301489-1 V2.2.3 (2019-11)/ EN 301489-3 V2.1.1 (2019-03) Radio: EN 300 220-1 v3.1.1 (2017-02)/ EN 300 220-2 v3.2.1 (2018-06) Health: EN 50663:2017 / EN 62479:2010 Safety: EN62368-1: 2014+ A11:2017
EMC	Compliance with EN 55032:2015/A11:2020, EN 55035:2017 IEC 61000-4-2 ESD IEC 61000-4-3 RS IEC 61000-4-4 EFT IEC 61000-4-5 Surge IEC 61000-4-6 CS IEC 61000-4-8 Pulse Magnetic Field

Ordering Information

Model	Description
LM200-900	LoRa /Modbus RTU Client Agent 1 x RS-485 Slave 2-wire, 1 x SMA Antenna Connector LM200-900: support EU868,AS923, KR920,US915 with frequency adjustable
LM200-400	LoRa /Modbus RTU Client Agent 1 x RS-485 Slave 2-wire, 1 x SMA Antenna Connector LM200-400: support EU433 with frequency adjustable
LC144-900	LoRa End-Node, 8CH AIO, 1 Modbus RTU 485 Host 2 x 0~10V input, 0.2% accuracy 2 x 4~20mA input, 0.3% accuracy 1 x 0~10V Output, Open Collect (O.C.) Type, 0.2% accuracy 1 x 4~20mA Output, 0.3% accuracy 1 x PWM Output (0~5V), 200mA (max), 0.2%Duty_Cycle Accuracy @1khz 1 x PWM (0~10V), Open Collect (O.C.) Type, 200mA, 0.2% Duty Cycle accuracy @1Khz, 10V(Max) 1 x RS485 Host, 2-wire 1 x SMA /LoRa Antenna Connector LC144-900: EU868, AS923, KR920,US915 with frequency adjustable
LC144-400	LoRa End-Node, 8CH AIO, 1 Modbus RTU 485 Host 2 x 0~10V input, 0.2% accuracy 2 x 4~20mA input, 0.3% accuracy 1 x 0~10V Output, Open Collect (O.C.) Type, 0.2% accuracy 1 x 4~20mA Output, 0.3% accuracy 1 x PWM Output (0~5V), 200mA (max), 0.2%Duty_Cycle Accuracy @1khz 1 x PWM (0~10V), Open Collect (O.C.) Type, 200mA, 0.2% Duty Cycle accuracy @1Khz, 10V(Max) 1 x RS485 Host, 2-wire 1 x SMA /LoRa Antenna Connector LC144-400: EU433 with frequency adjustable
Packing & Accessories	
	LoRa Device x 1
	Antenna x 1, 6dBm , SMA
	User's QIG x1

Optional Accessories	
MDR-40-24	Din Rail Power Supply, INPUT:85-264VAC, 120-370VDC, OUTPUT: 24VDC/1.7A, -20 ~ +70℃
A-LORA868-7dBi-SM-3M	Out-Door LoRa Antenna, Magnetic Sucker, SMA Male, 850-925MHZ, 7dBi, RG174 Cable, 3M Length, -40˚C~65˚C
A-LORA433-7dBi-SM-3M	Out-Door LoRa Antenna, Magnetic Sucker, SMA Male, 433MHZ, 7dBi, RG174 Cable, 3M Length, -40˚C~65˚C