

The Kathrein RAIN RFID reader RRU 7700 is the leading IoT device for all professional ITS solutions, in vehicle identification in harsh environments. The Kathrein ITS reader offers modularity for high-speed identification and end-to-end security at the same time.

With its best-in-class +33 dBm UHF RFID unit and PoE+ powering capability, the reader is the first choice for vehicle identification in harsh environments. Based on the latest RFID standards, such as EPC Gen2v2/ISO 18000-63, Kathrein RRU 7700 reader supports all market-leading transponder chips for security, authentication and encoding.

This makes the reader compliant to the Crypto Suite requirements for road tolling of ISO/IEC 29167-10. The reader fulfill as well the performance test for ISO/IEC 18046-2 and conformance test for ISO/IEC 18047-6.



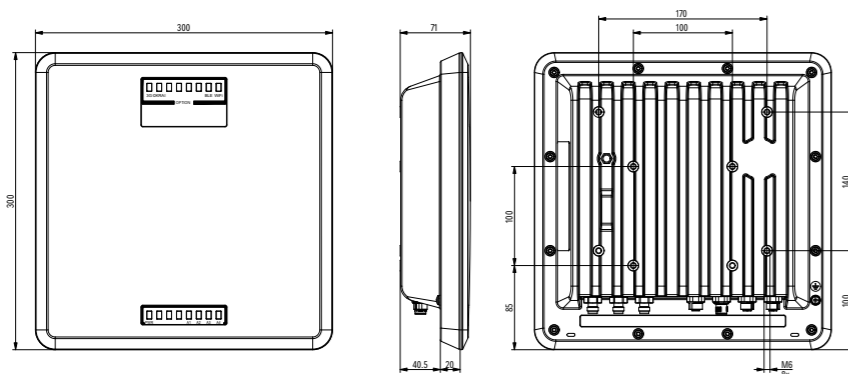
## Features

- high-speed vehicle identification
- accelerated data decoding
- efficient key handling on edge level with embedded High Secure Memory (HSM) module
- Crypto Suite compliant for road tolling ISO/IEC 29167-10
- compliant with ISO/IEC 18046-2 performance test and ISO/IEC 18047-6 conformance test
- ruggedised high-end RAIN RFID reader
- powerful IoT gateway
- enhanced RF design
- 4 antenna ports
- +33 dBm port power
- GPIO
- PoE+
- basic computing module
- embedded dual-core 800 MHz PC
- open source Linux OS
- advanced LED visualisation
- IP67 outdoor use\*
- type approval for Europe, in preparation vor US

## Key Applications

- Smart City Applications
- Vehicle Identification
- Tolling Applications
- Electronic Vehicle Registration

## Dimensions [mm]



## Note

### Risk of material damage!

- Make sure that the depth at which the screws are put into the housing of the reader does not exceed 10 mm (the tightening torque is 5 Nm).

## General Specifications

Type	ETSI Version		FCC Version	
	RRU 7700		RRU 7700	
Order number	52010592		52010594	
<b>RFID</b>				
Frequency range	[MHz]	865–868	902 - 928 MHz 915 - 921 MHz European Upper Band	
Impedance antenna port	[Ohm]	50		
Max. TX power conducted	[dBm]	33	30 (33 dBm with extended cable length)	
Max. TX power radiated	[dBm ERP] [dBm EIRP]	33	36	
RX sensitivity	[dBm]	typ. -80		
Number of antenna ports	[R-TNC]	4		
Standards		EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529, EPC Gen2 V2	FCC Part15, UL, IC, EPC Gen2 V2 (in preparation)	
		UCODE DNA, ISO/IEC 29167-10; ISO/IEC 18046-2; ISO/IEC 18047		
<b>ITS functionality</b>				
Vehicle identification		high-speed identification mode; selectable by SW <sup>1)</sup>		
Data transmission (air interface)		Profile optimized data throughput <sup>1)</sup>		
Key Handling		on edge level, with embedded High Secure Memory (HSM) module		
<b>Voltage</b>				
Local supply	[VDC]	+10 to +30		
Connector		M12, A-coded, 4-pole		
Remote feed	[VDC]	PoE+ according to 802.3at (35–57)		
		<ul style="list-style-type: none"> <li>Make sure that the router/switch supports 30 W in the static mode.</li> <li>Use the cable the length of which does not exceed 100 m.</li> <li>Make sure to use a Cat 6 cable or a higher level cable.</li> <li>Note that the internal supply of GPIO-VCC-pin is not possible with PoE+.</li> </ul>		
Connector		M12, X-coded, 8-pole, port 1 only		
<b>Power consumption</b>				
Local supply	[W]	25.4		
Remote feed	[W]	25.4		
<b>Embedded PC</b>				
Processor		ARMv7-A based processor, 2 cores @ 800 MHz		
Flash memory (eMMC)	[Gbyte]	8		
RAM DDR3	[Gbyte]	1		
Operating system		Linux		
<b>Ethernet</b>				
Number of Ethernet ports		2		
Data rate	[Mbit/s]	10/100		
Connector		M12, X-coded, 8-pole		

<sup>1)</sup> For the high-speed identification mode, please make sure that this mode is allowed in the respective country.

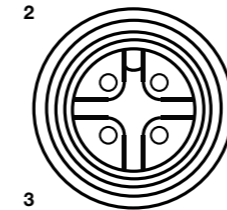
> **General Specifications**

Type	ETSI Version RRU 7700	FCC Version RRU 7700
Order number	52010592	52010594
<b>LED visualisation</b>		
Freely programmable		12
Fixed		1 (power LED)
<b>GPIO</b>		
Type		4 inputs, 4 outputs (double insulation possible)
Max. input voltage	[V]	30
Max. output voltage	[V]	30
Max. current per output port	[mA]	500
Max. current over all outputs	[mA]	1500
Connector		M12, A-coded, 12-pole
<b>RFID controller</b>		
Processor		ARMv7-A based processor with 600 MHz
Flash memory eMMC	[Gbyte]	4
RAM DDR2	[Mbyte]	128
Operating system		Linux
<b>Mechanical properties</b>		
Weight	[kg]	4.26
Degree of protection		IP67*
Operating temperature range	[°C]	-20 to +55
Storage temperature range	[°C]	-40 to +85
Dimensions (L x W x H)	[mm]	300 x 300 x 71

\* if all connections are made with a Kathrein cable or have Kathrein protective caps

> **Power Supply**

M12, A-coded, 4-pin, male

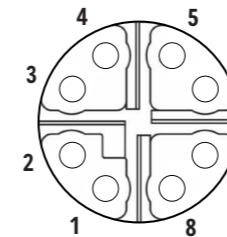


Pinout Power Supply

Pin	Allocation
1	+24 V DC
2	GND
3	GND
4	+24 V DC

> **Ethernet**

M12, X-coded, 8-pin, female

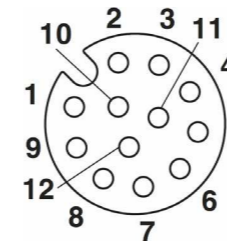


Pinout communication PoE+

Pin	Data	PoE
1	TX+	PoE Mode A
2	TX-	PoE Mode A
3	RX+	PoE Mode A
4	RX-	PoE Mode A
5		PoE Mode B
6		PoE Mode B
7		PoE Mode B
8		PoE Mode B

> **GPIO**

M12, A-coded, 12-pin, female

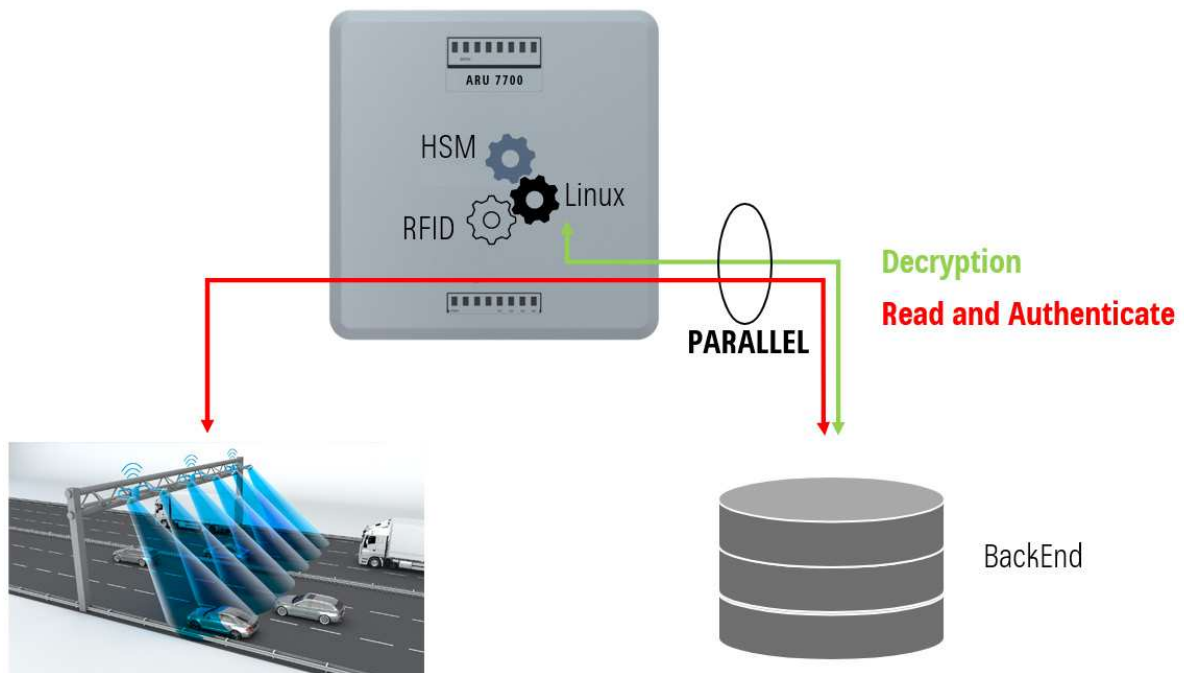


Pinout general purpose input output

Pin	Allocation	Pin	Allocation
1	OUT_CMN	7	UB
2	OUTPUT_1	8	OUTPUT_4
3	INPUT_3	9	OUTPUT_3
4	INPUT_CMN	10	OUTPUT_2
5	INPUT_1	11	INPUT_2
6	GND	12	INPUT_4

## > Feature of the Kathrein High Secure Memory (HSM-)Modul

Data Encryption and Key Handling with the enhanced HSM of RRU 7700:



### Data Decryption:

- Read and Authenticate in parallel
- High Secure handling and transmission of the keys
- High Speed decryption up to 300 km/h

### Key Diversification:

- Unique key for each transponder
- Key handling inside HSM