RAIN RFID Reader Systems | Page 1 of 5
ARU 7700 ITS Antenna Reader Unit

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RAIN RFID Reader Systems | Page 2 of 5
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The Kathrein RAIN RFID reader ARU 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.

The ARU 7700 has a built-in 70° wide-angle antenna and an additional 3 antenna outputs for connecting external antennas. The RRU 7700 is identical to the ARU 7700 and has no built-in antenna, but 4 external antenna ports.

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 ARU 7700 antenna reader supports all market-leading transponder 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 fulfills 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
- efficent 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 with an integrated antenna
- powerful IoT gateway
- enhanced RF design
- 3 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 for US

Key Applications

- Smart City Applications
- Vehicle Identification
- Tolling Applications
- Parking Applications

Dimensions [mm]
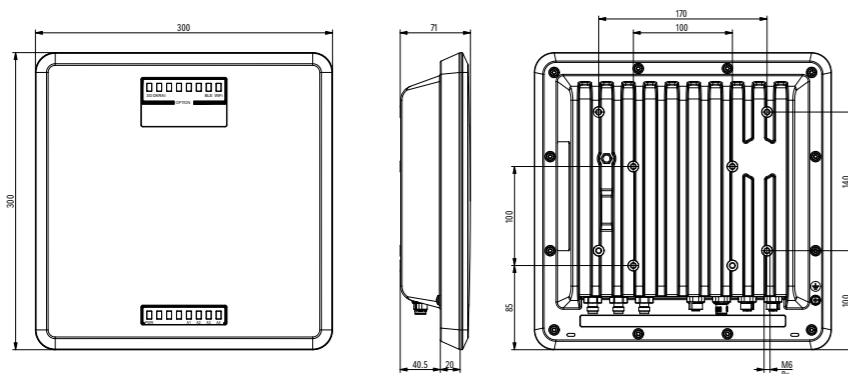
Note

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
		ARU 7700	**ARU 7700**
Order number		**52010593**	**52010595**
RFID			
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]	3	
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 18047-6	
ITS functionality			
Vehicle idendification		high-speed identification mode; selectable by SW[1]	
Data transmission (air interface)		Profile optimized data throughput[1]	
Key Handling		on edge level, with embedded High Secure Memory (HSM) module	
Antenna			
Half-power beam width	[°]	65	
Gain, linear	[dBi]	-	
Gain, circular	[dBiC]	8.5	
Voltage			
Local supply	[VDC]	+10 to +30	
Connector		M12, A-coded, 4-pole	
Remote feed	[VDC]	PoE+ according to 802.3at (35–57)	
		► Make sure that the router/switch supports 30 W in the static mode.	
		► Use the cable the length of which does not exceed 100 m.	
		► Make sure to use a Cat 6 cable or a higher level cable.	
		► Note that the internal supply of GPIO-VCC-pin is not possible with PoE+.	
Connector		M12, X-coded, 8-pole, port 1 only	
Power consumption			
Local supply	[W]	25.4	
Remote feed	[W]	25.4	
Embedded PC			
Processor		ARMv7-A based processor, 2 cores @ 800 MHz	
Flash memory (eMMC)	[Gbyte]	8	
RAM DDR3	[Gbyte]	1	
Operating system		Linux	

[1] For the high-speed identification mode, please make sure that this mode is allowed in the respective country.

RAIN RFID Reader Systems | Page 3 of 5
ARU 7700 ITS Antenna Reader Unit

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RAIN RFID Reader Systems | Page 4 of 5
ARU 7700 ITS Antenna Reader Unit

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General Specifications

Type		ETSI Version ARU 7700	FCC Version ARU 7700
Order number		52010593	52010595
Ethernet			
Number of Ethernet ports		2	
Data rate	[Mbit/s]	10/100	
Connector		M12, X-coded, 8-pole	
LED visualisation			
Freely programmable		12	
Fixed		1 (power LED)	
GPIO			
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	
RFID controller			
Processor		ARMv7-A based processor with 600 MHz	
Flash memory eMMC	[Gbyte]	4	
RAM DDR2	[Mbyte]	128	
Operating system		Linux	
Mechanical properties			
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
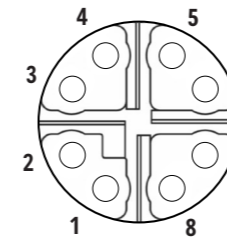
Power Supply

M12, A-coded, 4-pin, male
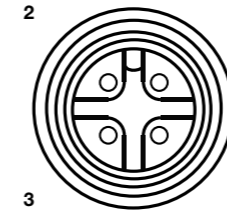
Pinout Power Supply

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
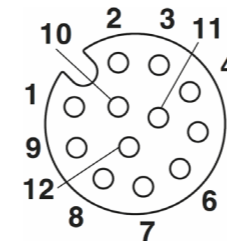
Pinout general purpose input output

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

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

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

PARALLEL

Decryption

Read and Authenticate

BackEnd
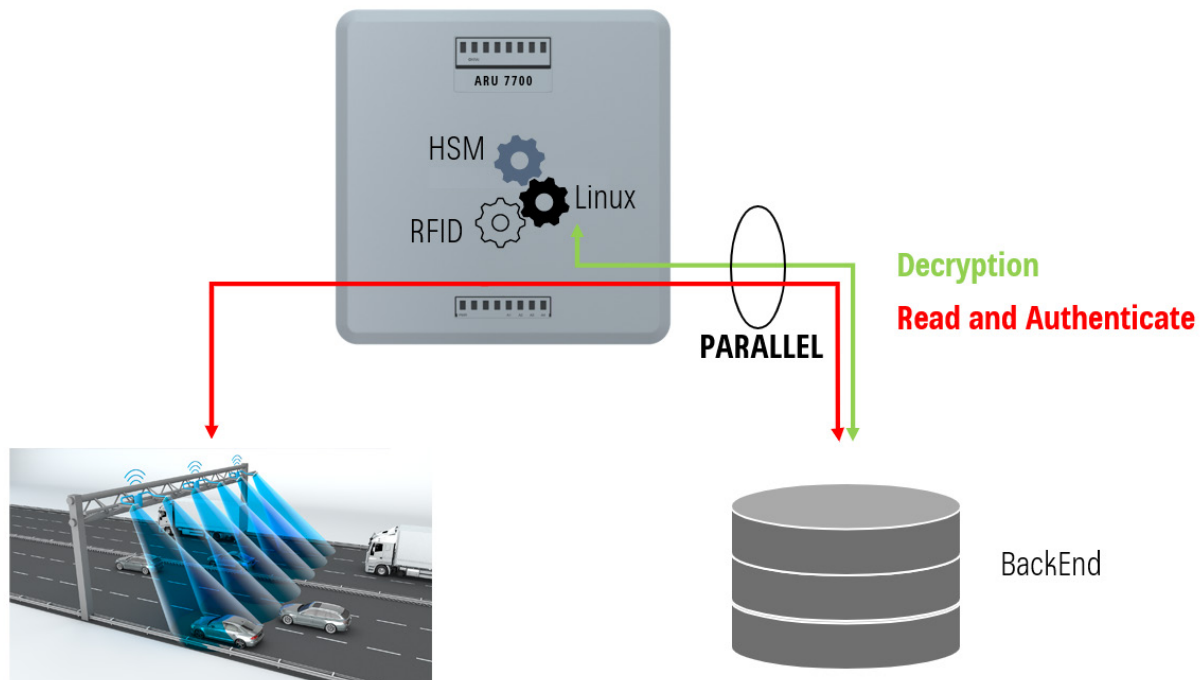
Data Decryption:

- 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