Syrus 4G
IoT TELEMATICS GATEWAY

One device, multiple applications, infinite possibilities.

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IoT Secure Element — Inside

Robust IoT Telematics Gateway designed for the most demanding fleet management operations, offering sensor scalability and multi-platform compatibility. Powered by APEX, a DCT Linux distribution capable of hosting third party applications.
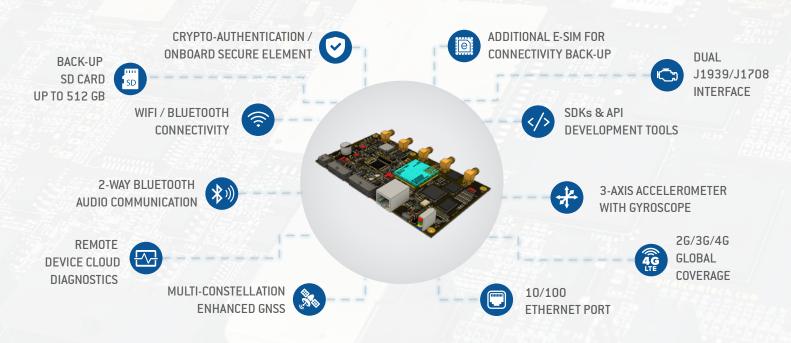
An optional centralized back-end platform, Pegasus IoT Cloud, is availbale in order to maximize Syrus 4G capabilities, perform remote device diagnostics, expedite integration development and interact with a complete API infrastructure .

Special features include a 4G LTE Cat 4 modem, cellular back-up eSim, WiFi/Bluetooth connectivity, ethernet port, multiple CAN interfaces, GNSS capability, powerful programming engine and an industry leading hardware based security, making Syrus IoT Telematics Gateway the ideal solution tailored for your specific needs.

COMPATIBLE WITH

Pegasus *IoT Cloud*

POWERED BY

APEX LINUX

HARDWARE FEATURES

BACK-UP SD CARD UP TO 512 GB

CRYPTO-AUTHENTICATION / ONBOARD SECURE ELEMENT

WIFI / BLUETOOTH CONNECTIVITY

2-WAY BLUETOOTH AUDIO COMMUNICATION

REMOTE DEVICE CLOUD DIAGNOSTICS

MULTI-CONSTELLATION ENHANCED GNSS

ADDITIONAL E-SIM FOR CONNECTIVITY BACK-UP

DUAL J1939/J1708 INTERFACE

SDKs & API DEVELOPMENT TOOLS

3-AXIS ACCELEROMETER WITH GYROSCOPE

2G/3G/4G GLOBAL COVERAGE

10/100 ETHERNET PORT

DCT
ACTIONABLE TELEMATICS

KEY FEATURES

Onboard Secure Element

Syrus Onboard secure element solution is a tamper-resistant hardware platform, capable of securely hosting applications and storing confidential and cryptographic data. It guarantees that user data and keys are stored securely and that communications are done in a secure way.

Advanced Interaction through APIs

Create and deploy IoT/M2M solutions quickly with Pegasus IoT Cloud/REST APIs. Eliminate the complexity of data abstraction and interact without the hassle of learning hardware protocols.

eSIM Back-up Connectivity

Enhance connectivity coverage with an embeded eSIM power by DCT Cloud Connect global wireless data service. This will serve as a back-up connectivity for the main SIM card.

Satellite Connectivity

Uptime is an important aspect of fleet management. Even with Dual LTE Global connectivity downtime can be experienced in remote areas. Iridium ™ connectivity with the Satcom accessory can increase the uptime of data when it matters. *Satcom sold separately.*

Tire Pressure Monitoring (TPMS)

The third-largest operating cost for most fleets are tires. Properly managing them is vital for reducing costs and possible problems on the road. TPMS integrations help keep track of the state of tires by measuring temperature and pressure in real time.

Engine Diagnostics Monitoring

By connecting to the vehicle's ECU module, receive engine data that can help to remotely diagnose the health of the vehicle. Get real time alerts of engine error codes, for fleet maintenance and reducing vehicle downtime.

Blackbox Functionality

See the true impact of a crash, with blackbox functionality get event data recording at the time of an incident. High precision accelerometer data can be downloaded and used to reconstruct an accident. Automatically generate a call to any designated number.

Extended Storage

Securely store events or video content on a micro SD card up to 512 GB SD/SDHC class 10. External USB 2.0 Hard Drive. *SD card & Hard Drive not included.*

Fatigue / Distracted Driver Detection

Avoid fatigue related accidents. Using a fatigue detection camera, set in-cabin voice notifications to warn the driver if it detects a possible fatigue/distracted event. Also send alerts in real time.

Hotspot / WiFi Functionality

Add connected vehicle capabilities to your fleet with onboard WiFi. Provide connectivity to several wi-fi devices within the vehicle. Reduce communication downtimes and maximize efficiency.

Syrus Dashcam / Video On Demand

See what they see. Using Syrus Dashcam, record event triggered videos. Also stream live video on demand and/or back-up large files locally. Connect to compatible Advanced Driver-Assistant Systems (ADAS) cameras.

Multi-sensor/Accessories Compatibility & Application Scalability

Multiple ports for different sensors and accessories and SDKs for edge integration from device to cloud.

2-way Bluetooth Audio Communication

Customize audio messages via bluetooth audio to alert drivers of any relevant events. Receive phone calls from any authorized numbers using Hands-Free Bluetooth standard incabin headsets.

DEVICE LABEL

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SYRUS 4G LTE Cat 4
IoT Telematics Gateway

USB Login
IP Address: 192.168.7.2
Username: admin
Password: admin

Contains FCC ID: XMR201903EG25G
Contains IC : 10224A-201903EG25G
This device complies with Part 15 of the FCC Rules.
Operation is subject to the condition that this device
may not cause harmful interference.

RoHS CE FC

S/N: 11:22:33:44:55:66

IMEI: 1 2 3 4 5 6 7 8 9 6 5 4 3 2 1

e-SIM: 0 1 2 3 4 5 6 7 8 9 8 7 6 5 4 3 2 1 0

BT MAC: 11:22:33:44:55:66

WL MAC: E1:22:33:44:F5:66

CM MAC: 11:22:33:44:55:66

TECHNICAL SPECIFICATIONS

PRODUCT INFORMATION

Manufacturer	Digital Communications Technologies
Brand	DCT
Model Description	Syrus 4G LTE Cat 4 IoT Telematics Gateway

PART NUMBER

S4G-CAT4-ME	Modem Embedded GNSS Module
S4G-CAT4-MPCB	Modem + PCB Mounted GNSS Module

HARNESS CABLES

S4G-4CON	4 Pin Connector
S4G-14CON	14 Pin Connector (order separately)
S4G-16CON	16 Pin Connector (order separately)

Note: antennas not included

PHYSICAL

Unit Dimensions	174.1 mm x 95.2 mm x 33.5 mm
Weight	220 g
Material	Polycarbonate 94v-0 for higher temperatures
Case Rating	IP-64
LEDs	Red (System)
	Blue (Bluetooth/WiFi)
	Green (LTE/Connectivity)
	Yellow (GNSS)

ENVIRONMENTAL

Operating Temperature	-30°C to 85°C
Storage Temperature	-25°C to 40°C
Operating Humidity	Up to 95% non-condensing
Storage Humidity	10% to 90% non-condensing

BACKUP BATTERY

Capacity	1.2 A
Operating Voltage	3.7 V
Technology	Polymer Li-Ion
Weight	6 g
Protection	Internal PCM Circuit
Temperature Ranges	Charge: 0°C to 40°C
	Discharge: -20°C to 40°C

POWER SUPPLY PROTECTIONS

Overvoltage	Yes
Over-current	Yes
Max: 1.6 A	
Reverse Polarity	Yes
Internal Resettable Fuse	Yes

CONNECTORS

4 Pin Molex Type	PWR, IN1, IGN, GND
16 Pin Molex Type	IN1 - IN7, OUT1 - OUT4, AN1 - AN4, GND
14 Pin Molex Type	RS-232 Tx/Rx/RTS/CTS
	RS-485 D+/D-, J1708 A/B
	CAN 1 High/Low, CAN 2 High/Low, 1-Wire
WiFi/ BT Antenna	2 - MIMO 2.4GHZ RP-SMA (F)
GNSS	1 - SMA (F)
4G LTE CAT4	2 - MIMO LTE SMA (F)
USB	1 - Micro USB 2.0 OTG
Ethernet	1 - RJ45

DUAL SIM CARD

Automotive Grade SIM Holder	Dual-Point contact design
2FF Form Factor	Auto-lock latch prevent card ejection
	Card detection switch
	High resistance against impact/ temperature & shock

eSIM CHIP

MFF2 Form Factor	ETSI TS 102.671 + extended JEDEC tests set Quality Process
	ISO 9001 Classification RoHS, REACH, Halogen-Free
Operating temperature	-40°C to + 105°C

ANTENNAS

OPTION 1 - 5-in-1 Combo Antenna
Taoglas - Part # MA285.LBICG.001
5 iGNSS, 2*LTE MIMO & 2*Wi-Fi MIMO Low Profile Antenna

OPTION 2A - Dual WiFi Antenna
DCT - Part # YB0008HA
2.4/5.8G WIFI

OPTION 2B - Dual Cellular + GNSS Antenna
DCT - Part # YB0008GA
Cellular 4G+4G DIV+GNSS

ELECTRICAL

Operating Voltage	8 - 38VDC
Power Consumption	
Deep Sleep Mode	1mA @ 12V
Active Tracking	70mA @ 12V

TECHNICAL SPECIFICATIONS

CELLULAR MODEM SPECIFICATIONS

Manufacturer/Model	Quectel EG25-G
Data Transmission	LTE FDD: Max 150Mbps (DL)/Max 50Mbps (UL)
	LTE TDD: Max 130Mbps (DL)/Max 35Mbps (UL)
	DC-HSDPA (3G): Max 42Mbps (DL)
	HSUPA (3G): Max 5.76Mbps (UL)
	WCDMA (3G): Max 384Kbps (DL)/Max 384Kbps (UL)
	EDGE (2G): Max 296Kbps (DL)/Max 236.8Kbps (UL)
	GPRS (2G): Max 107Kbps (DL)/Max 85.6Kbps (UL)
Frequency Bands	
4G LTE Cat 4 USA	2100(B1), 1900(B2), 1800(B3), AWS(B4), 850(B5), 2600(B7), 900(B8), 700(B12), 700(B13), 850(B18), 850(B19), 800(B20), 850(B26), TDD (B41)
4G LTE Cat 4 Global	2100(B1), 1900(B2), 1800(B3), AWS(B4), 850(B5), 2600(B7), 900(B8), 700(B12), 700(B13), 850(B18), 850(B19), 800(B20), 850(B26), 700(B28), TDD B38, TDD B39, TDD B40, TDD B41
3G: Penta band	800/850/900/1900/2100MHz
2G: Quad band	850/900/1800/1900MHz
Output Power	Class 4 (33dBm±2dB) for GSM850
	Class 4 (33dBm±2dB) for EGSM900
	Class 1 (30dBm±2dB) for DCS1800
	Class 1 (30dBm±2dB) for PCS1900
	Class E2 (27dBm±3dB) for GSM850 8-PSK
	Class E2 (27dBm±3dB) for EGSM900 8-PSK
	Class E2 (26dBm±3dB) for DCS1800 8-PSK
	Class E2 (26dBm±3dB) for PCS1900 8-PSK
	Class 3 (24dBm+1/-3dB) for WCDMA bands
	Class 3 (23dBm±2dB) for LTE-FDD bands
	Class 3 (23dBm±2dB) for LTE-TDD bands
Type Allocation Code (TAC)	86769804

OPERATING SYSTEM

Processor	Sitara™ ARM® Cortex®-A8 32Bits Processor @ 1GHz
Flash Memory	4GB
RAM Memory	4Gb DDR3
PRU's	2 x 32Bits Coprocessors for Real Time applications @ 200MH
Linux OS Apex Distribution by DCT	

ROUTER MANAGEMENT

Pegasus IoT Cloud Gateway
Local web user interface (Telnet/SSH/USB)
SMS Commands
SNMP

DIMENSIONS

PCB Dimensions (L x W)	142 mm x 80 mm
Enclosure Dimensions (L x W x H)	174.1 mm x 95.2 mm x 33.5 mm

174.1 mm

95.2 mm

33.5 mm

MOUNTING

Screw Mount
Tie-Wrap

GNSS SPECIFICATIONS

	Modem Embedded	PCB
GNSS Solution Part Number	S4G-CAT4-ME	S4G-CAT4-MPCB
Frequencies (MHz):		
GPS	1575.42±1.023	1575.42
GLONASS	1597.5~1605.8	598.0625~1605.375
Galileo	1575.42±2.046	E1, 1575.42
BeiDou	1561.098±2.046	B1, 1561.098
QZSS	1575.42	-
GNSS Sensitivity:		
Cold Start	-146 dBm	-148 dBm
Reacquisition	-156 dBm	-163 dBm
Tracking	-157 dBm	-165 dBm
TTFF:		
Hot start	2 seconds	1 second
Warm start	3 seconds	33 seconds
Cold start	28 seconds	35 seconds
Accuracy	<2.5 m	<2.5 m
Channels	48	99
Altitude		10,000 m
Velocity		515 m/s
DGPS	SBAS (default) [WAAS, EGNOS, MSAS, GAGAN]	

ACTIONABLE TELEMATICS

TECHNICAL SPECIFICATIONS

PERIPHERALS

Outputs	4 - Open Drain Outputs
	Continuous Current Capacity: 1.6A
	Maximum Instantaneous Current: (< 1 sec): 10A
	Maximum Switching Voltage: +32V
	Automatic Overvoltage/Over-current
	Resettable Protection
Inputs	7 - Discrete Inputs (Ground activated)
	1 - Pulse counter input up to 1KHz
	(one of the 7 inputs can be configured as a pulse counter) from 0V to 32V. 50KΩ Impedance
	1 - Ignition Input. 50KΩ Impedance
	2 - Analog Input (ADC). Voltages from 0V to 28V. 127KΩ Impedance
	1 - Differential analog input. Voltages from 0V-11V
Data Comm Ports *Serial ports are mutually exclusive	1 - 10/100 Ethernet Port RJ45
	1 - USB OTG Micro-B Connector
	1 - RS-232 Serial Port*
	1 - RS-485 Serial Port*
	1 - SAE J1708/J1587*
	1 - One-Wire Bus
	2 - CAN J1939 (2.0b) (Supports ISO 11783, ISO 15765, J1939, & FMS)
Data Storage *SD Card & Hard Drive not included	Micro SD Card 512 GB SD/SDHC class 10*
	External USB 2.0 Hard drive*
Bluetooth Audio	Dedicated Audio Processor Support of SBC Encoding + A2DP
	Voice Speech Codec Modes: HR/FR/EFR/AMR/AMR-WB
	Echo Arithmetic:
	Echo Cancellation/Noise Suppression
	VoLTE (Voice over LTE)
	Speech recognition over Bluetooth
	Programmable voice prompts

NETWORK PROTOCOLS

MQTT, TCP, UDP, IPv4, IPv6, ICMP, NTP, DHCP, DNS, HTTP, HTTPS, SSL v3, TLS, ARP, PPPoE, UPNP, SSH, Telnet, SNMP

CERTIFICATIONS

FCC: XMR201903EG25G

IC (Industry Canada): 10224A-201903EG25G

CE (pending)

PTCRB (pending)

AT&T (pending)

UL (pending)

TRUST PLATFORM

Security based on hardware

Cryptographic coprocessor with secure hardware-based key storage (ATECC608)

Protected storage for up to 16 keys, certificates, or data

Hardware support for asymmetric sign, verify, and key agreement:
    ECDH: FIPS SP800-56A Elliptic Curve Diffie-Hellman
    NIST standard P256 elliptic curve support

Hardware support for symmetric algorithms:
    SHA-256 & HMAC hash including off-chip context save/restore
    AES-128: encrypt/decrypt, galois field multiply for GCM

Web Security:
    AES 256 Data Encryption
    Supports TLS 1.2 & 1.3 Protocols

Onboard Secure Element:
    AWS Certificate

Certificate-based authentication for any Public Key Infrastructure (PKI), any cloud platform (AWS IoT authentication, Microsoft Azure IoT Hub authentication, Google IoT authentication, among others)

Token-based authentication

Secure boot (with key attestation)

Over-the-Air (OTA) verification

Firmware IP protection

Message encryption

Key rotation

I/O protection key

Host accessory authentication

WI-FI

Manufacturer/Model: Texas Instruments WL 1835MOD

WLAN Baseband Processor and RF Transceiver Support of IEEE Std 802.11b, 802.11g, and 802.11n

Frequency: 2412 - 2484 MHZ

20- and 40-MHz SISO and 20-MHz 2 × 2 MIMO at 2.4 GHz for High Throughput: 80 Mbps (TCP), 100 Mbps (UDP)

Wi-Fi Direct Concurrent Operation (Multichannel, Multirole)

Transmitter output power 18.5dBm

BLUETOOTH 4.2

Manufacturer/Model: Texas Instruments WL 1835MOD

Bluetooth 4.2 Secure Connection Compliant and CSA2 Support

Dedicated Audio Processor Support of SBC Encoding + A2DP

Dual-Mode Bluetooth and Bluetooth Low Energy

Frequency: 2402 - 2480 MHZ

BT BR/EDR Transmitter output power: 11.7 dBm

BT BLE Transmitter output power: 7.0 dBm

PINOUT

PIN	WIRE COLOR	SIGNAL	DESCRIPTION
		4 PIN MOLEX TYPE	
1	WHITE/BLUE	IN1	Active ground input. Detects ON when v <= 2 V, OFF when v >= 2.5 V or when HZ Max 30 V. Zin > 50 Kohm.
2	YELLOW	IGN	Ignition sensor: Detects ON when v >= 6.1 V, OFF when v <= 4.6 V. Max. 30 V. Zin >30 Kohm.
3	BLACK	GND	Device's electrical ground.
4	RED	PWR	Main Power Cable, 8 - 38V DC. Connect directly to battery positive terminal.
		14 PIN MOLEX TYPE	
1	ORANGE	RS232_TX	Data transmitter.
2	BLUE	RS232_RX	Data receiver.
3	WHITE/ORANGE	RS485_D+	Data transmitter
4	PURPLE	J1708_A+	Positive signal of the J1708 bus. Connect to the vehicle's J1708A+ cable. This cable is twisted together with the brown/white J1708B- cable.
5	YELLOW	CAN1_H	Primary positive signal of the J1939/FMS bus. Connect to the vehicle's CAN_H cable. This cable is twisted together with the green CAN1_L cable.
6	CYAN	CAN2_H	Secondary positive signal of the J1939/FMS bus. Connect to the vehicle's CAN_H cable. This cable is twisted together with the white/light green CAN2_L cable.
7	WHITE/RED	1WIRE	Delivers 3.3 V. 50mA. Max. Standard and overdrive velocities.
8	GRAY	RS232_RTS	Request to send flow control.
9	WHITE/BLACK	RS232_CTS	Clear to send flow control.
10	PINK	RS485_D-	Data receiver.
11	BROWN/WHITE	J1708_B-	Negative signal of the J1708 bus. Connect to the vehicle's J1708B- cable. This cable is twisted together with the purple J1708A+ cable.
12	GREEN	CAN1_L	Primary negative signal of the J1939/FMS. Connected to the vehicle's CAN_L cable. This cable is twisted together with the yellow CAN1_H cable.
13	WHITE/LIGHT GREEN	CAN2_L	Secondary negative signal of the J1939/FMS bus. Connect to the vehicle's CAN_L cable. This cable is twisted together with the cyan CAN2_H cable.
14	BROWN	GND	Device's electrical ground.
		16 PIN MOLEX TYPE	
1	WHITE	AN1	Analog input 1. From 0 V to 28 V. Zin = 127 kOhm.
2	PINK	AN2	Analog input 2. From 0 V to 28 V. Zin = 127 kOhm.
3	BLUE	AN_DIFF_IN+	Differential input +. From 0 V to 11 V. Zin = 127 kOhm.
4	GRAY	AN_DIFF_IN-	Differential input -. From 0 V to 11 V. Zin = 127 kOhm.
5	BLUE/RED	OUT1	User output: open drain output. Max. 1.8 A, 30 V.
6	BLUE/YELLOW	OUT2	User output: open drain output. Max. 1.8 A, 30 V.
7	BLUE/BLACK	OUT3	User output: open drain output. Max. 1.8 A, 30 V.
8	BLUE/WHITE	OUT4	User output: open drain output. Max. 1.8 A, 30 V.
9	WHITE/BLUE	IN1*	Active ground input. Detects ON when v <= 2 V, OFF when v >= 2.5 V or when hi-Z Max 30 V. Zin > 50 kOhm.
10	WHITE/ORANGE	IN2*	Active ground input. Detects ON when v <= 2 V, OFF when v >= 2.5 V or when hi-Z Max 30 V. Zin > 50 kOhm.
11	WHITE/GREEN	IN3*	Active ground input. Detects ON when v <= 2 V, OFF when v >= 2.5 V or when hi-Z Max 30 V. Zin > 50 kOhm.
12	WHITE/RED	IN4*	Active ground input. Detects ON when v <= 2 V, OFF when v >= 2.5 V or when hi-Z Max 30 V. Zin > 50 kOhm.
13	WHITE/BLACK	IN5*	Active ground input. Detects ON when v <= 2 V, OFF when v >= 2.5 V or when hi-Z Max 30 V. Zin > 50 kOhm.
14	WHITE/YELLOW	IN6*	Active ground input. Detects ON when v <= 2 V, OFF when v >= 2.5 V or when hi-Z Max 30 V. Zin > 50 kOhm.
15	WHITE/PURPLE	IN7*	Active ground input. Detects ON when v <= 2 V, OFF when v >= 2.5 V or when hi-Z Max 30 V. Zin > 50 kOhm.
16	BROWN	GND	Device's electrical ground.

*Inputs can be used as a 1kHz pulse counter.