

G3-PLC module
SGCM-P4x series

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Name	P/N	Descriptions
SGCM-P40	SGPL-002-1L-R	Single phase G3-PLC module in FCC band (145.3kHz ~ 478.12kHz)
SGCM-P40-EVK	SGPL-002-1L-test-R	G3-PLC EVKit



G3-PLC module

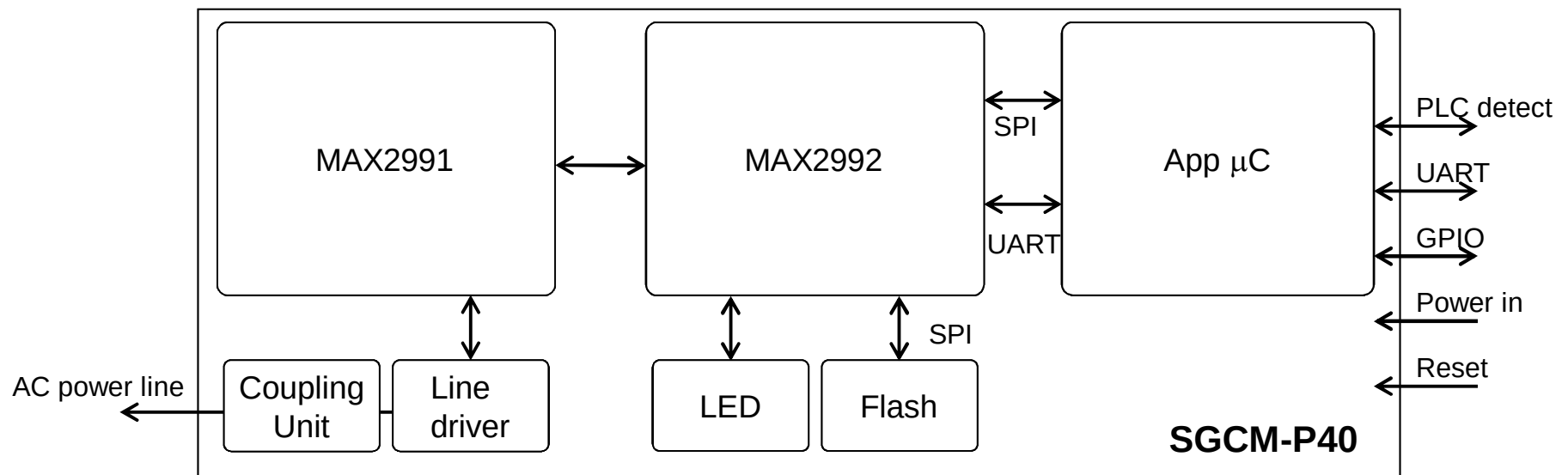


G3-PLC Evaluation Board

Key Features of G3-PLC module

- **Promotes Interoperability**
 - 10kHz to 490kHz operation complies with FCC, CENELEC, and ARIB
 - Coexists with IEC 61334, IEEE® P1901, and ITU G.hn systems
- **Reduces Infrastructure Costs**
 - Transmission over 6km on medium voltage lines means fewer repeaters
 - Communication across transformers allows fewer data concentrators
- **Cyber Security**
 - 6LoWPAN adaptation layer supports IPv6 packets
 - Fast AES-128 cryptographic engine
- **Built-In Robustness**
 - OFDM-based PHY ensures robust operation
 - IEEE 802.15.4-based MAC layer is well suited to lower data rates
 - Robust mode overcomes noisy channel conditions
 - Two layers of forward error correction
- **Intelligent Communication Mechanisms**
 - Adaptive tone mapping maximizes bandwidth utilization
 - Channel estimation optimizes modulation between neighboring nodes
 - Mesh routing protocol selects best path between remote nodes

Block diagram of SGCM-P40



General spec.

Feature	Description
General	
Operation frequency	FCC band: 145.3kHz ~ 478.12kHz (72 carriers)
Modulation	ROBO / DBPSK / DQPSK / D8PSK
Transmit power	+6dBm ~ -10dBm (can be set by software)
Power supply	Core power supply: +4 ~ +5 VDC Line driver power supply: +12 ~ +12.5 VDC
Power consumption	Maximum power consumption: 3.6W Average power consumption: 1.1W
Storage temperature	- 30°C to +70°C / 5% to 95%, non-condensing
Operation temperature	- 40°C to +85°C / 5% to 95%, non-condensing
Dimension	70mm × 40mm × 22.1mm
RoHS	All hardware components fully compliant with EU RoHS Directive

Hardware characteristics

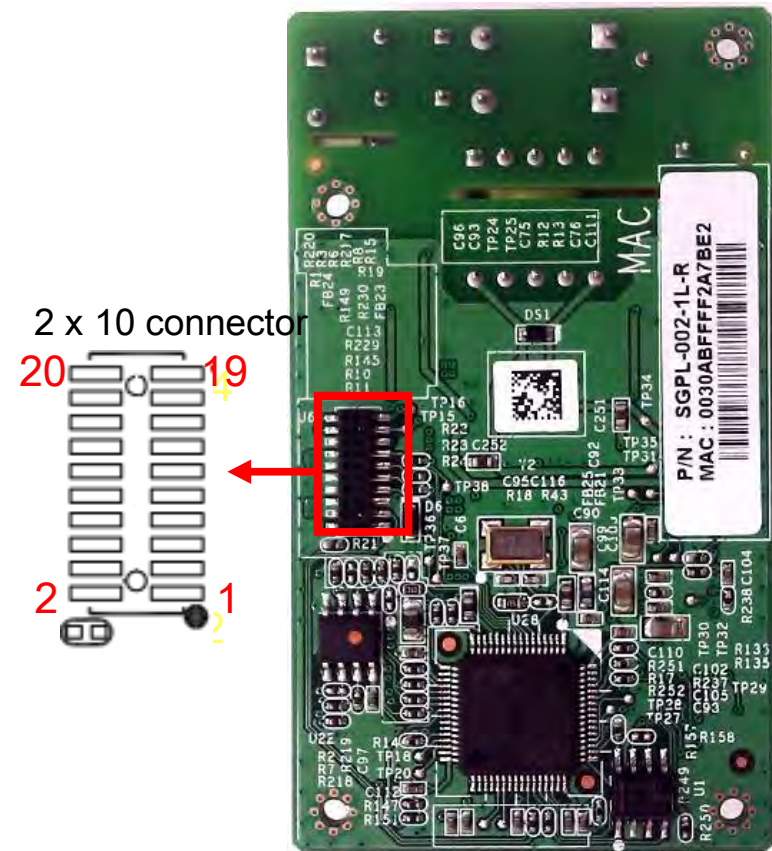
Rating	Min	Max	Unit
Supply voltage 5V	+4.0	+5.0	V
Supply voltage 12V	+12.0	+12.5	V
PLC_RSTN VIH	+2.0	+3.8	V
PLC_RSTN VIL	−0.3	+0.5	V
Maximum current (12V)		200	mA
Maximum current (5V)		620	mA
Operating temperature	−30	+70	°C
Storage temperature	−40	+85	°C

Power consumption	Typ	Max	Unit
Power on			
Current consumption in 12V	9.6	40	mA
Current consumption in 5V	184	620	mA
Active			
Current consumption in 12V	15	200	mA
Current consumption in 5V	184	620	mA

Digital single connector to Main board

Pin #	Name	Pin #	Name
1	PLC RX	2	PLC_Detect
3	PLC TX	4	+5V _{in}
5	GND	6	+5V _{in}
7	PLC_RSTN	8	GND
9	GPIO 2	10	GND
11	GPIO 1	12	+12V _{in}
13	GPIO 0	14	+12V _{in}
15	PLC_3.3V	16	GND
17	JTMS_SWIO	18	GPIO 3
19	JTMS_SWCLK	20	GPIO 4

PLC module bottom side



Analog single to AC power line

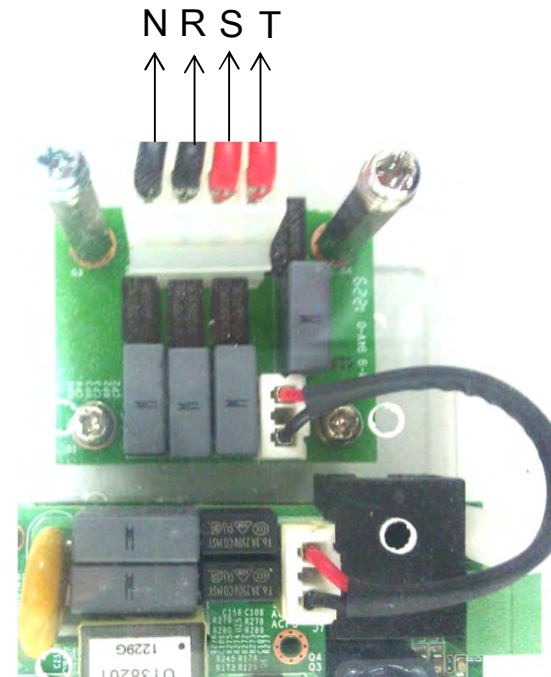
PLC module top side



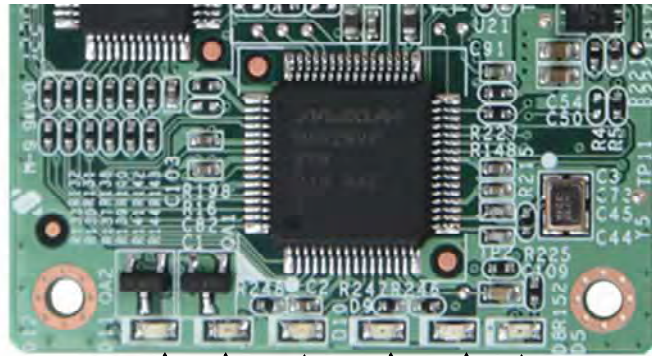
AC line for PLC signal



3 phase solution



LED indicators



User define 2 ————
User define 1 ————
Collision LED ————

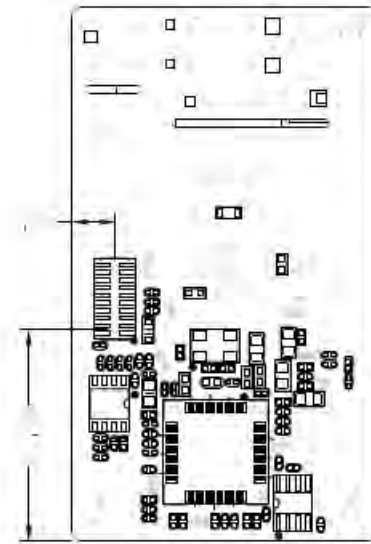
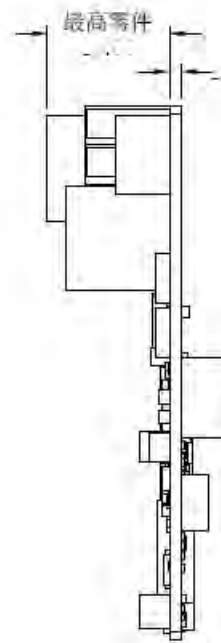
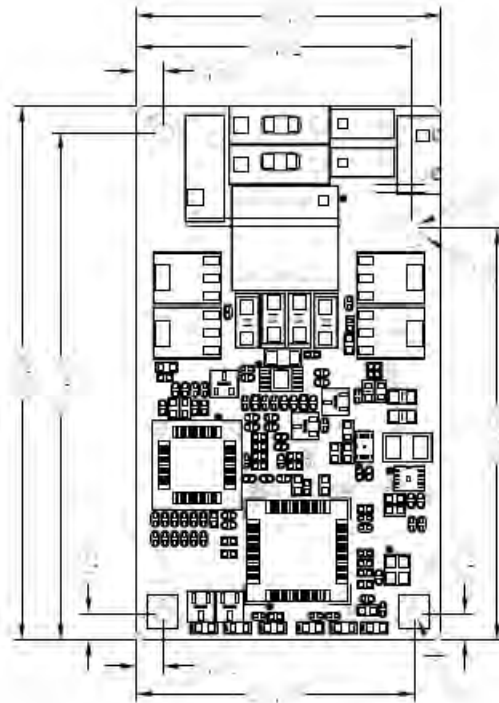
Power LED
Activity LED
Ready LED

Dimension information

W: 40 mm

H: 23 mm

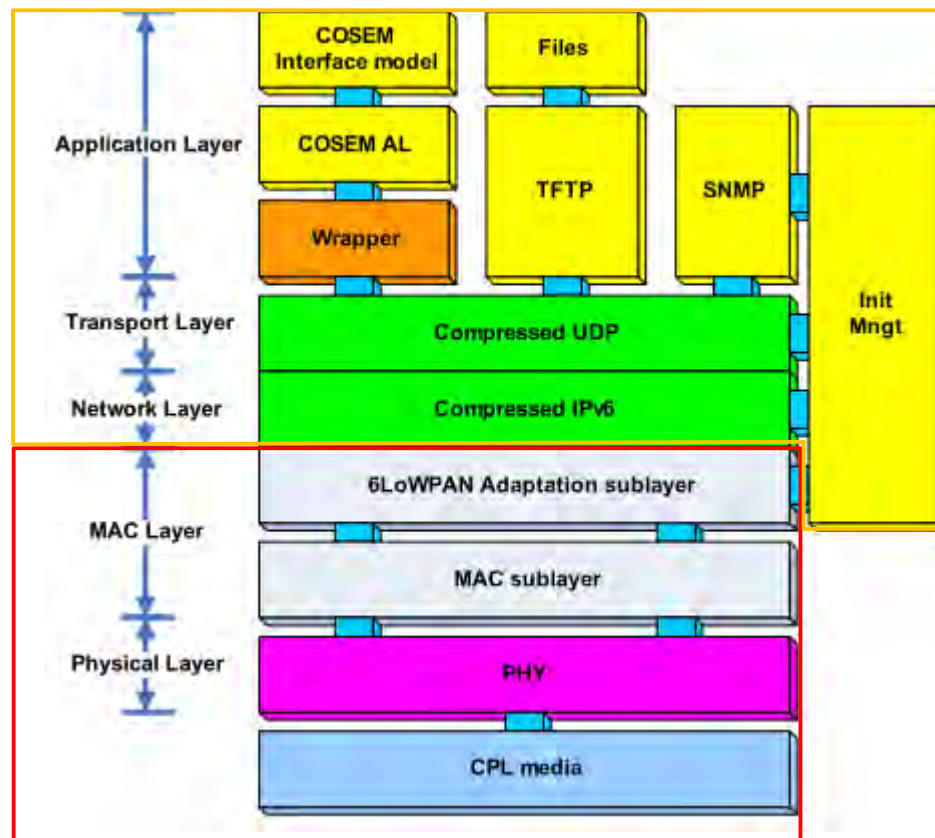
L: 70 mm



Software development

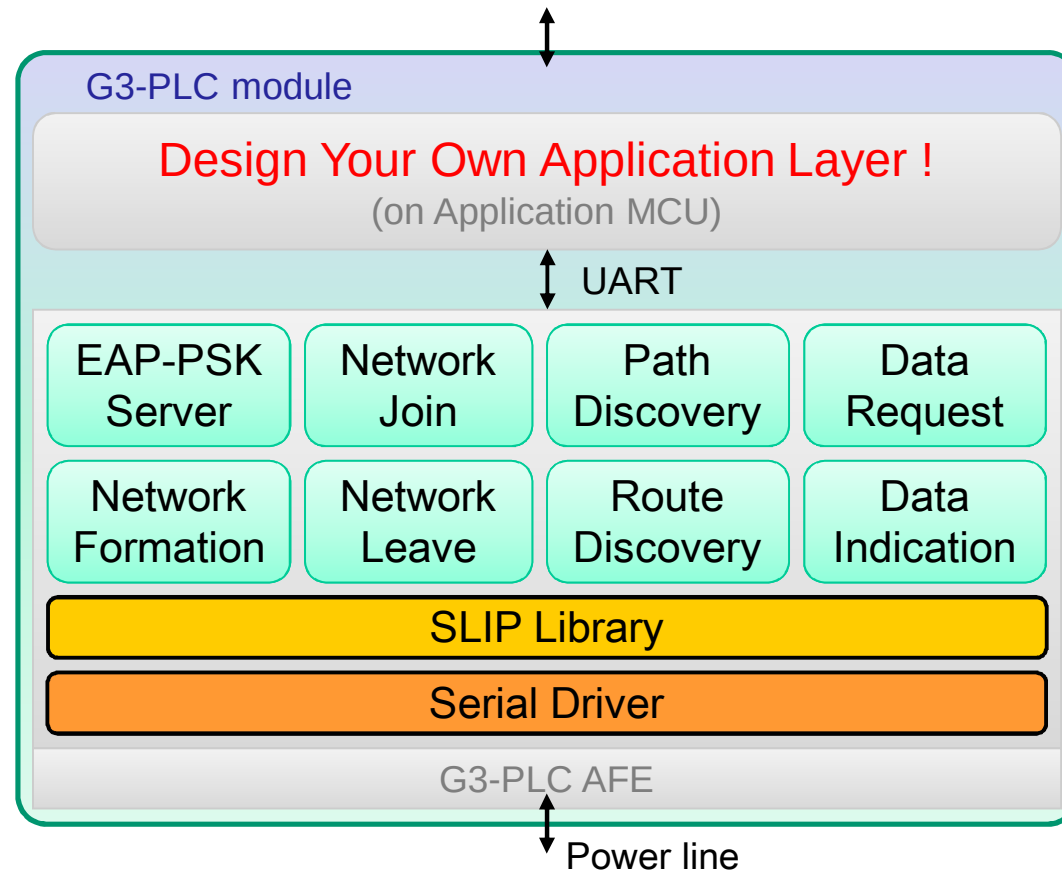
Application software
From us or
designed by customers

PHY to Adaptation
From Chip Vendor



We provide 2 kinds of software support!!

Opt 1: G3-PLC with libraries



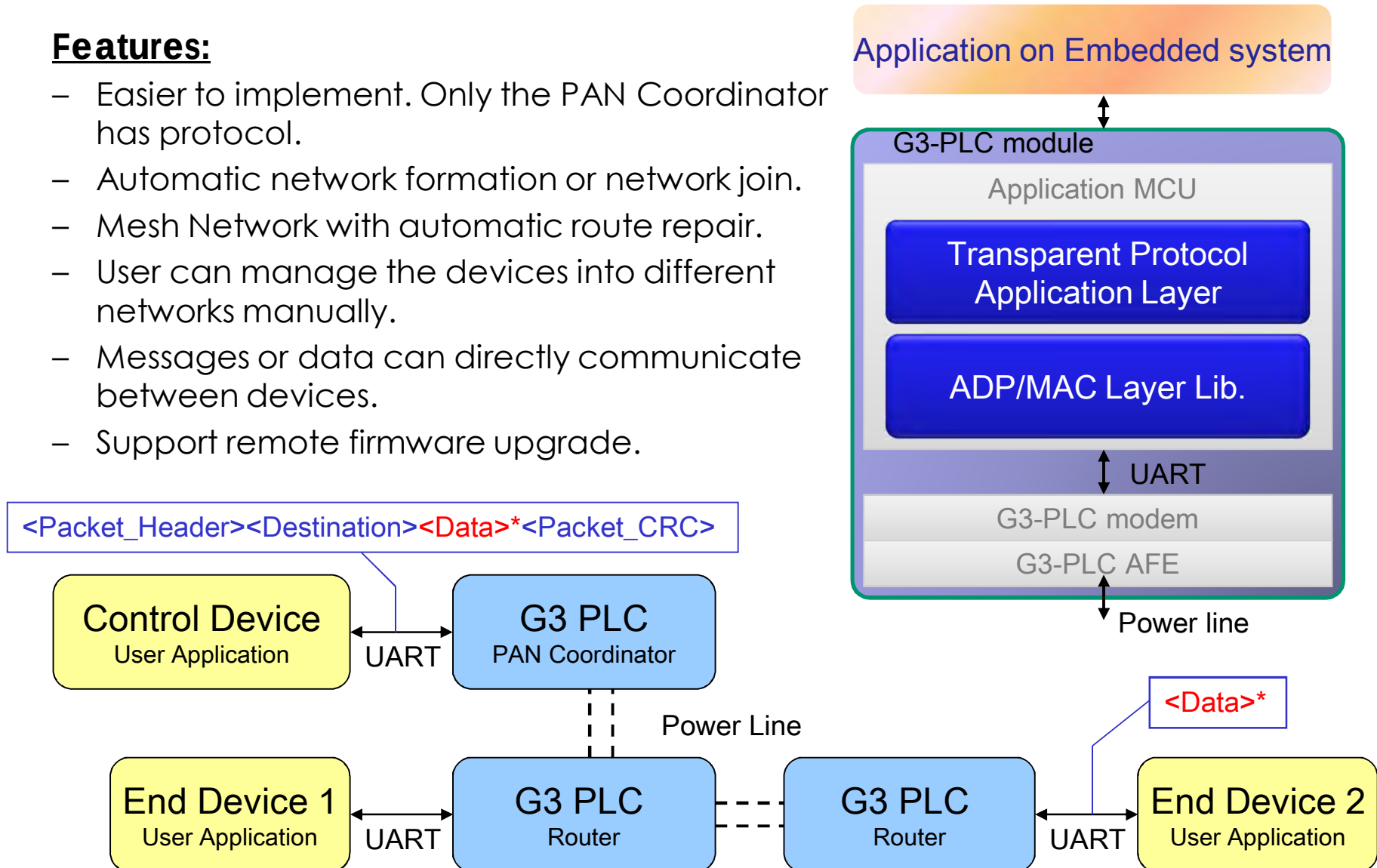
Features:

- Develop the application based on the ADP/MAC layer Library.
- Control the behavior of network and the application layer.
- Shorter the development schedule.

Opt 2: G3-PLC with Transparent Protocol

Features:

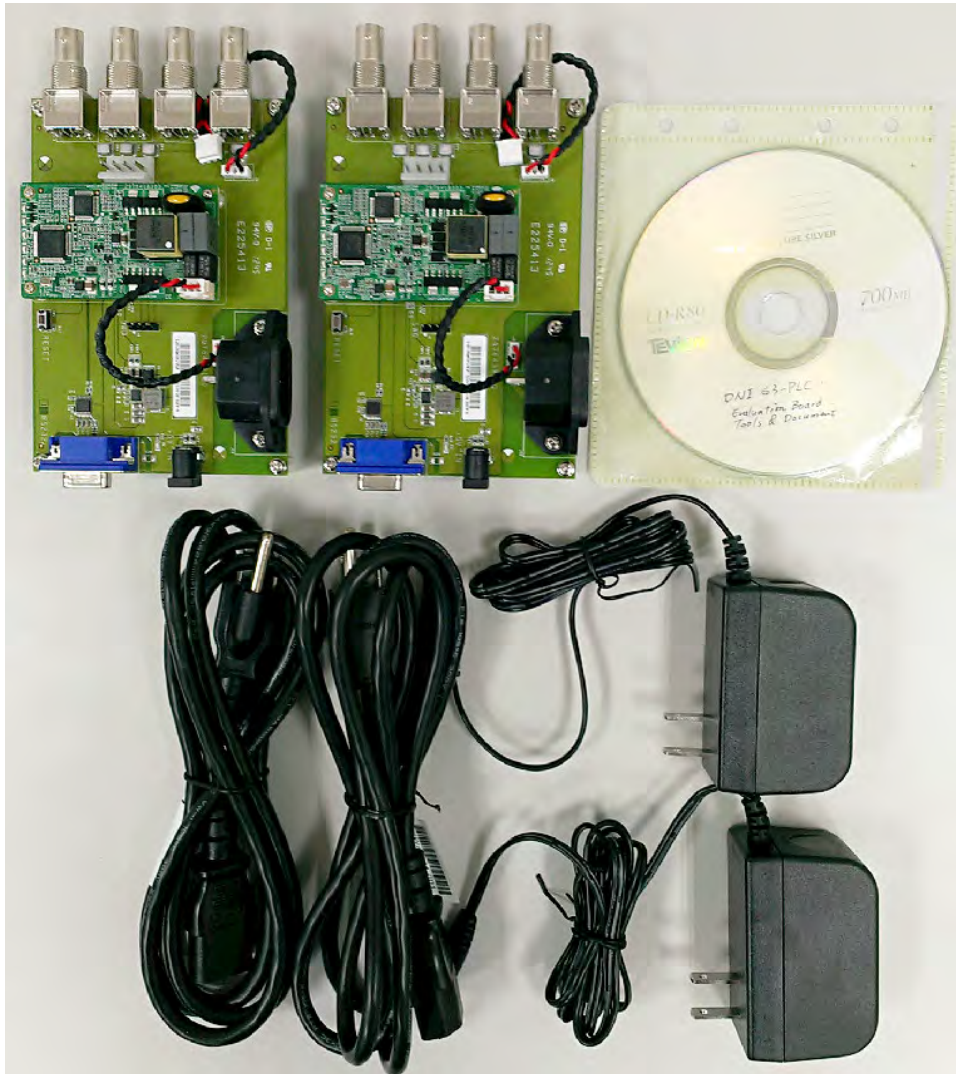
- Easier to implement. Only the PAN Coordinator has protocol.
- Automatic network formation or network join.
- Mesh Network with automatic route repair.
- User can manage the devices into different networks manually.
- Messages or data can directly communicate between devices.
- Support remote firmware upgrade.



Order information

Items	Contains	Descriptions	Status
Evaluation Suit I	G3-PLC module x 2 SGCM-P40-EVK x 2 DC Adapter x 2 Power cable x 2 Document & Software x 1	• G3-PLC evaluation kit with Maxim simple MAC firmware • Support G3-PLC module communication test via MAX2992 connect	Available Now
Evaluation Suit II	G3-PLC module x 2 SGCM-P40-EVK x 2 DC Adapter x 2 Power cable x 2 Document & Software x 1	• G3-PLC evaluation kit with Maxim full MAC firmware and transparent protocol • Support application software development	Available Now
G3-PLC module	SGCM-P40 x 1	G3-PLC module with transparent protocol	Available Now

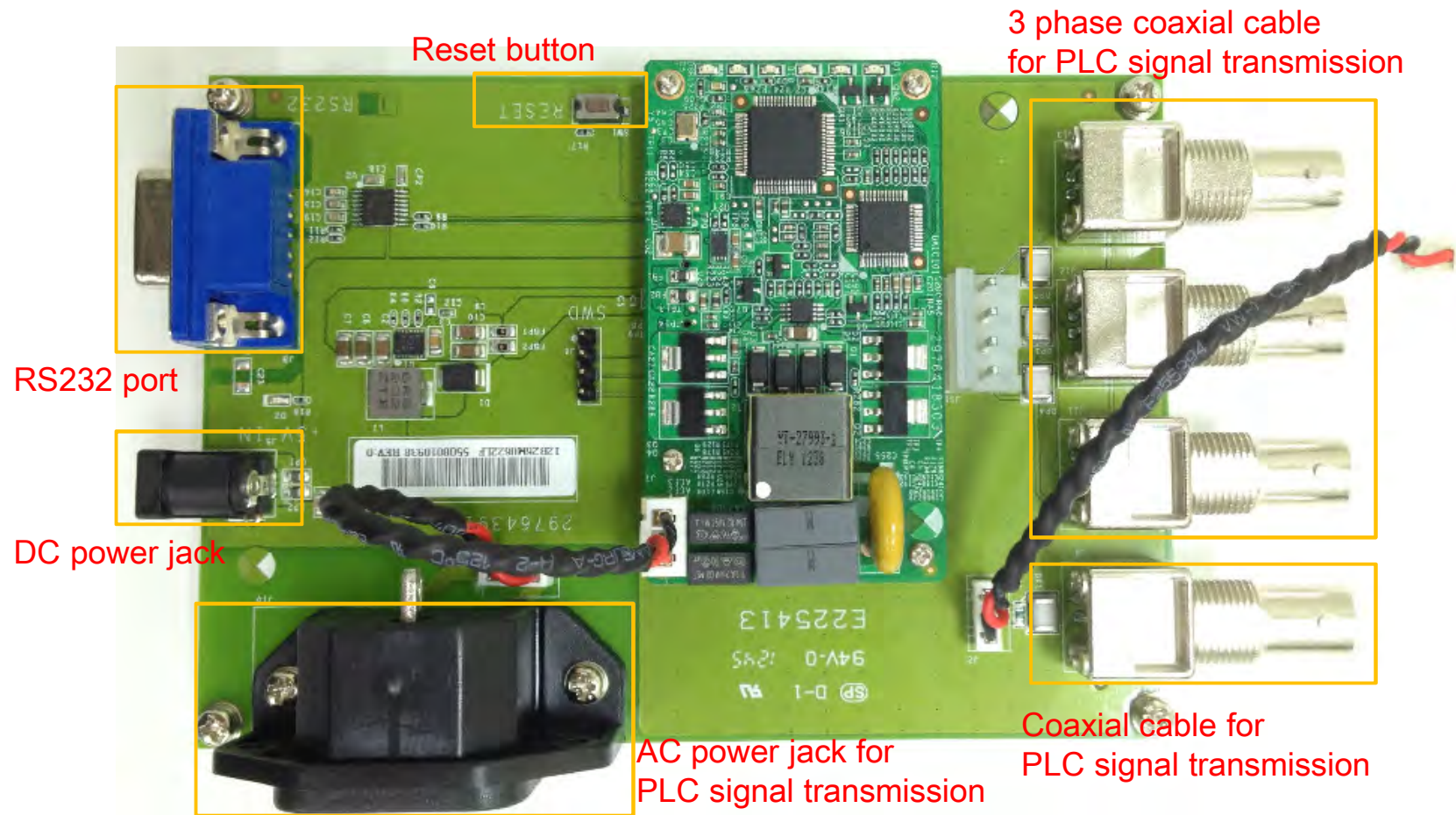
Evaluation Suit



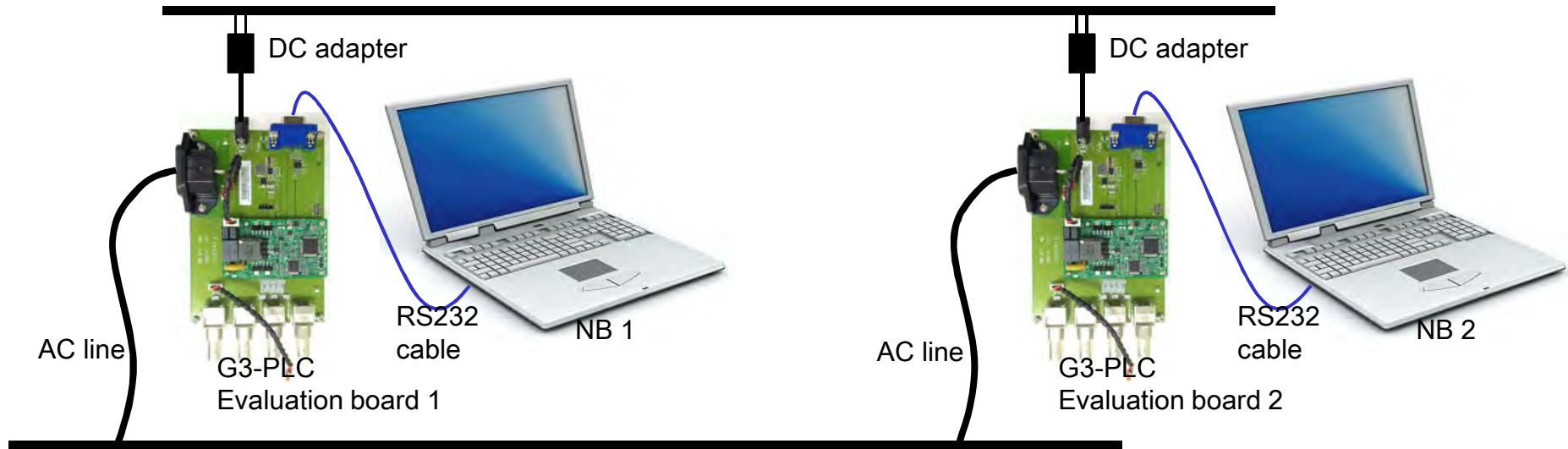
Items:

- G3-PLC module x 2
- G3-PLC Evaluation Board x 2
- Power adapter x 2
- AC power cable x 2
- Document & Software disk x 1

G3-PLC Evaluation board



G3-PLC communication test





Thank you.