



LIM Series: Industrial Lithium Ion Battery:

LIM25H

LIM50EN

LIM40E-13/LIM40E-14



Pursuing new value in energy and the possibilities of the future

INDEX

Line Up

LIM25H Series 04



	Nominal Voltage(V)	Nominal Capacity(Ah)	The Number of Cells
LIM25H-8	28.8	25.0	8
LIM25H-12	43.2		12

LIM50EN Series 05



	Nominal Voltage(V)	Nominal Capacity(Ah)	The Number of Cells
LIM50EN-8	29.6	50.0	8
LIM50EN-12	44.4		12

LIBMII (Battery Management System) 06

LIM40E Series 08



	Nominal Voltage(V)	Nominal Capacity(Ah)	The Number of Cells
LIM40E-13	48.8	40.0	13
LIM40E-14	52.5		14

Installation Record 10

Telecom
Industrial Machinery
Energy Storage Systems

Our batteries are manufactured to the highest standards and deliver high quality, long life and superior performance in a wide variety of applications. GS Yuasa's Battery products deliver reliable battery power for Telecommunications, Renewable Energy, Uninterruptible Power Supply (UPS), Emergency Lighting, and Automotive industries.



Features of the LIM Series

1 Full Range of Applications

Designed to deliver excellent performance for various applications, such as Telecom, UPS, ESS, EV, and Automatic Guided Vehicle.

2 High Reliability

These modules are manufactured in Japan using the high quality components and under rigorous Japanese quality control standards.

3 Long Cyclic Life

Designed to deliver high cycle life and high power.

4 Superior High Rate Performance

Excellent performance in high-power applications where high charge and discharge rates are required.

5 PSOC (PARTIAL STATE OF CHARGE)

Not effected by partial state of charge (PSOC) operation. The formation of sulfate crystals that causes early failure in other battery chemistries is not a factor in this battery.

Product

High Power Modules

LIM25H Series

Features

- 24C Maximum Rate
- More than 30,000 Cycle Life*
- Tolerance of cold temperatures down to -20°C (-4°F)

*DOD@100%, Temp 25Deg C
The data is for reference purposes.
Actual performance varies by condition

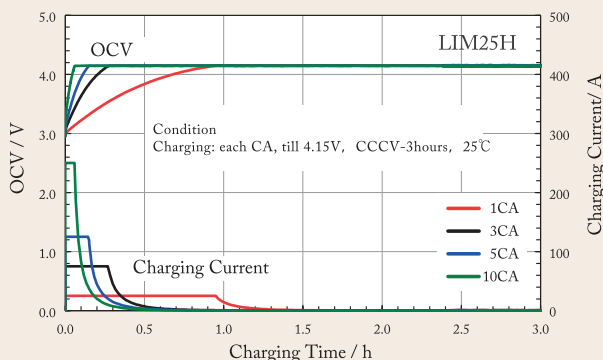
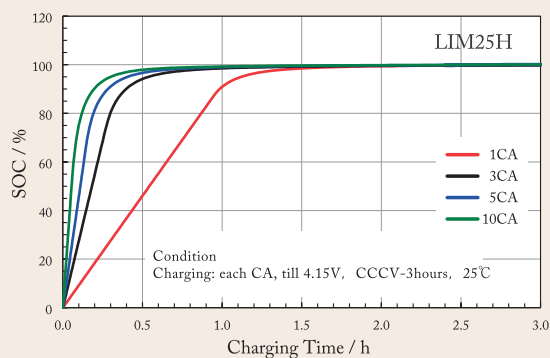


	LIM25H-8	LIM25H-12
The number of cells	8	12
Nominal Capacity (Ah)	25	
Nominal Voltage (V)	28.8	43.2
Max Charging and Discharging Rate (°C)	24C	
Ambient Temperature (°C)	Charging: -10 Deg C ~ + 45 Deg C Discharging: -20 Deg C to 45 Deg C	
Weight (kg, lbs)	17.5kg 38.58Lbs.	27.0kg 59.52Lbs.
Dimension (L×W×H / mm, in)	440 × 219 × 128 mm 17.32 × 8.62 × 5.05 in	617 × 219 × 128 mm 24.29 × 8.62 × 5.04 in

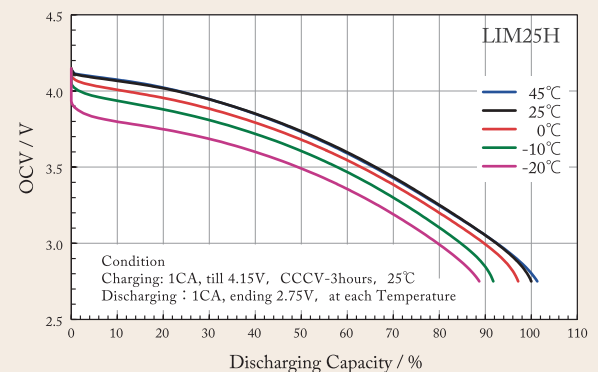
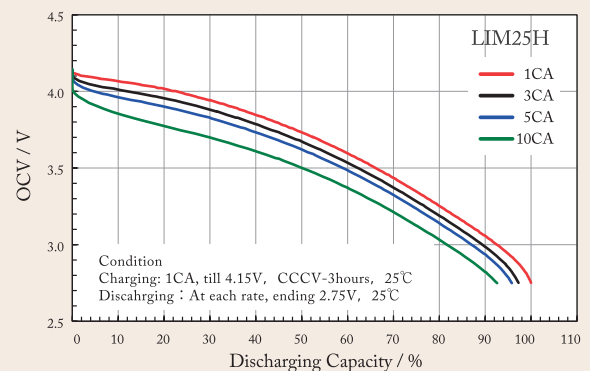
Applications

- AGV
*Automatic Guided Vehicle Automatic
- RTG
*Rubber Tired Gantry Crane
- Diesel Hybrid Train
- UPS

Charging Characteristics



Discharging Characteristics



The data is for reference purposes.
Actual performance varies by condition

High Energy Modules

LIM50EN Series

Features

- 6C Discharging Maximum Rate
- Tolerance of cold temperatures down to -20°C (-4°F)
- Deliver high cycle life and high power
- More than 5,000 Cycles*

*DOD@100%, Temp25 Deg C
The data is for reference purposes.
Actual performance varies by condition

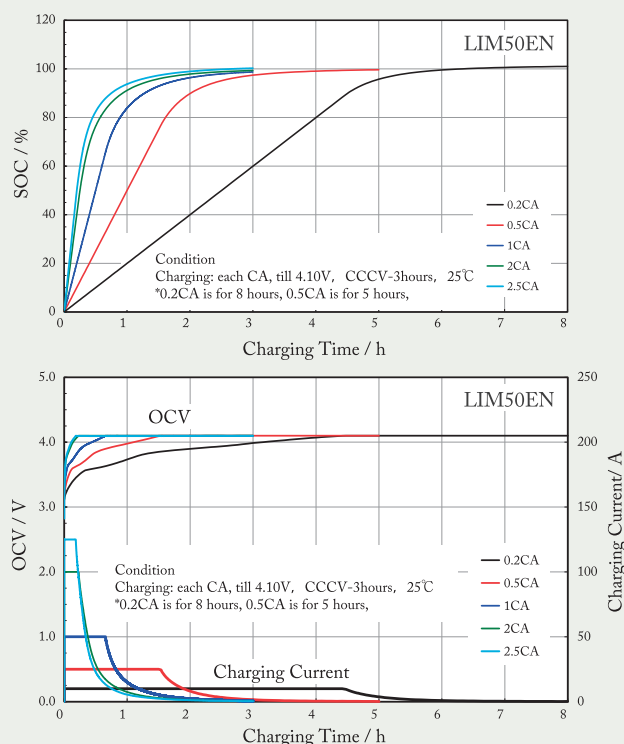


	LIM50EN-8	LIM50EN-12
The number of cells	8	12
Nominal Capacity (Ah)	50	
Nominal Voltage (V)	29.6	44.4
Max Charging and Discharging Rate (C)	Charging: 2.5C, Discharging: 6C	
Ambient Temperature (C)	- 20 Deg C ~ + 45 Deg C	
Weight (kg, lbs)	18.0kg 39.68Lbs.	27.0kg 59.52Lbs.
Dimension (L×W×H/ mm, in)	440 × 219 × 128 mm 17.32 × 8.62 × 5.05 in	617 × 219 × 128 mm 24.29 × 8.62 × 5.04 in

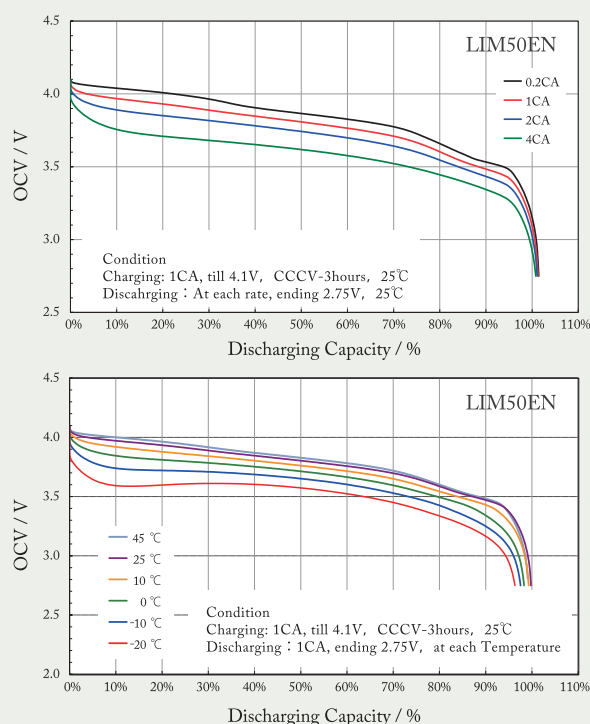
Applications

- UPS
*Uninterruptible Power System
- ESS
*Energy Storage System
- AGV
*Auto Guided Vehicle Automatic
- UPS

Charging Characteristics



Discharging Characteristics



The data is for reference purposes.
Actual performance varies by condition

Product

Battery Management System (LIBM II)

The lithium ion battery requires appropriate battery management to protect the battery from over discharge, over charge, heat up etc. Each battery module is equipped with a battery monitoring PCB which measures and sends signals of cell voltage and module temperature to a battery management PCB (LIBMII) which protects the battery in case of overcharge, overdischarge, over heatup or over current.

Features

- **Balancing Function**
Automatically adjusts each cell voltage
- **State of Charge(SOC) Calculation**
Battery SOC is monitored in real time and automatically calculated.
- **Multiple Banks Batch Monitoring**
Domain LIBMII, which is the master of Bank LIBMII for each string, can monitor a large battery system all at once.
- **High Voltage System Specification**
Max DC1800V (LIM25H)



LIBM II Specifications

	Standard Type	High Voltage Type
Input Voltage (V)	DC21~27	
Max Series Connection (Module)	26	53
Max Parallel Connection (Bank)	72	36
Ambient Temperature (°C)	-20 Deg C ~ + 65 Deg C	
Mass (g)	210 (Circuit Board), 800 (Touch Panel)	

■ Logging Function

Can record charging current, cell voltage, SOC and battery temperature. Recorded data can be downloaded by web interface or collected by using USB memory.

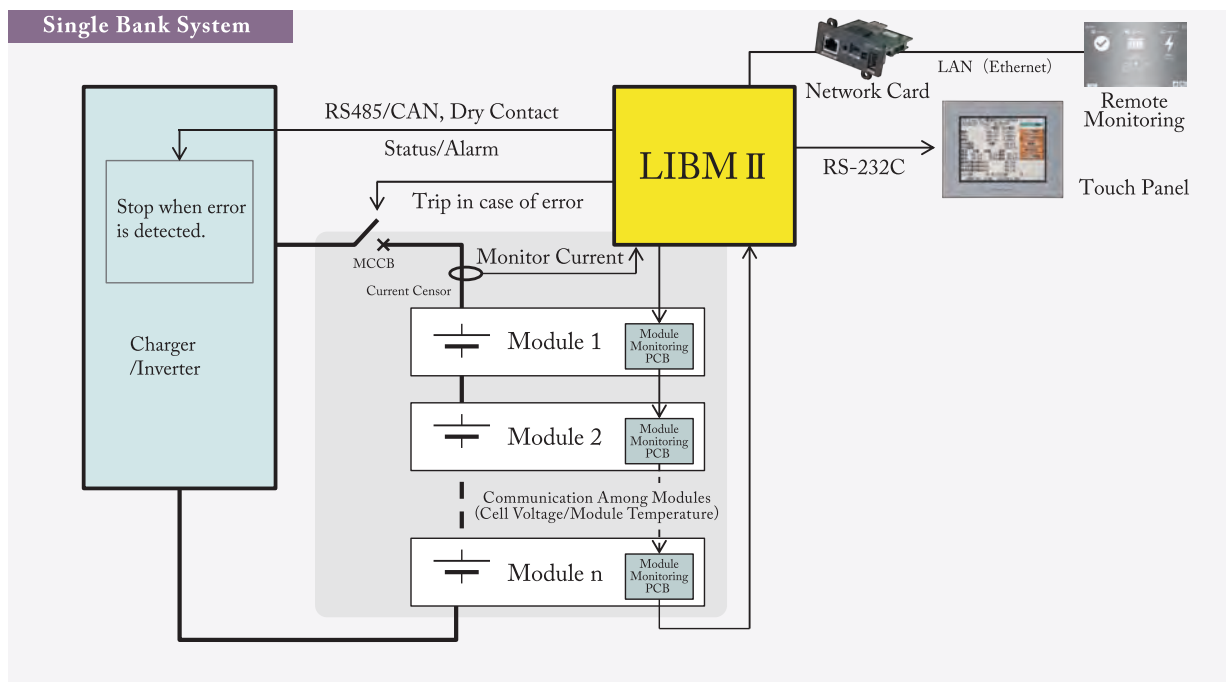
■ Modbus/TCP, SNMP Communication

Having multiple types of communication makes it possible to interface with various types of customers' device including remote monitoring systems.

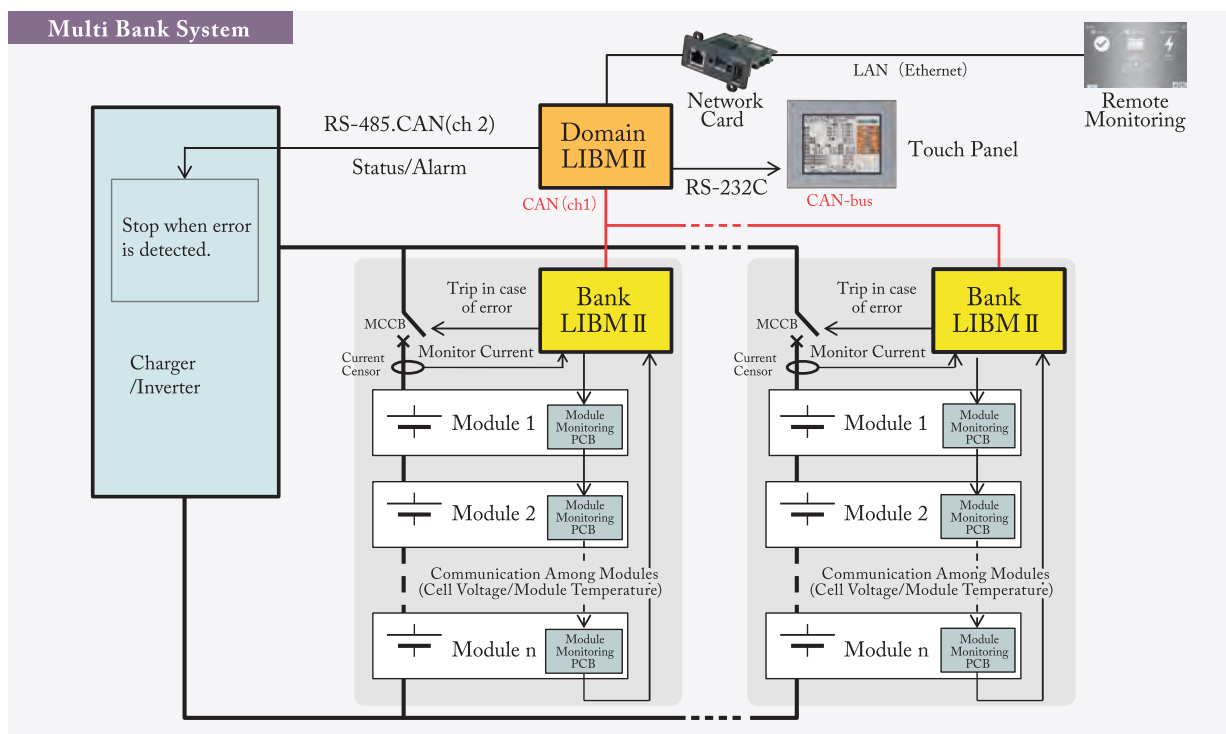


How does Battery Management System work?

LIBMII collects data from the module monitoring PCB and outputs status of a battery to an external device. In case of an abnormality, LIBMII will independently send signal to bank MCCB to disconnect battery bank. For a single battery bank application, only one LIBMII is required. In case of multiple battery banks, one LIBMII is for each bank and a domain LIBMII is required to monitor all strings.



LIBM II has two CAN Channels. Channel 1(ch1) is for monitoring battery status and Channel 2(ch2) is for communication with external device.



Product

Modules For Cyclic Telecom Applications

LIM40E Series

Features

- 1.25C Charging/Discharging Maximum Rate
- Tolerance of cold temperature down to -20°C (-4°F)
- More than 5,000 Cycles*

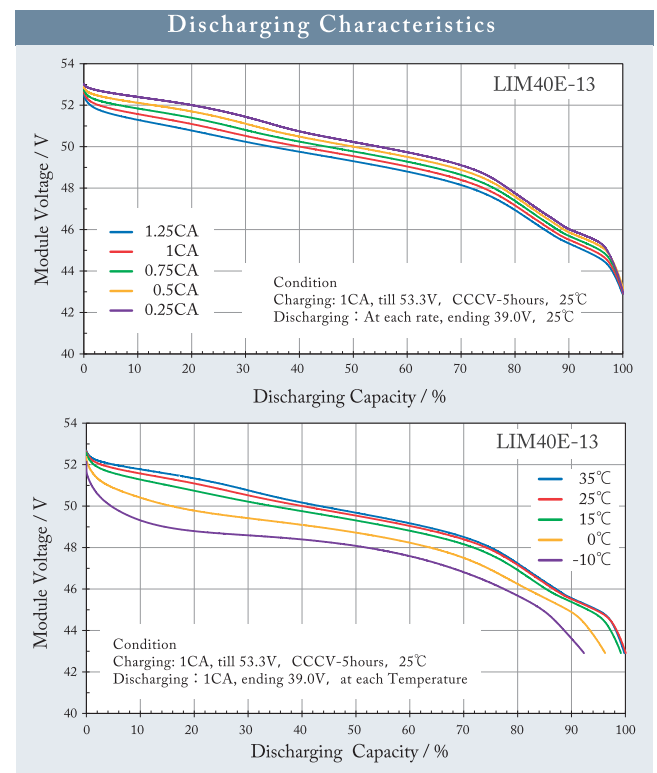
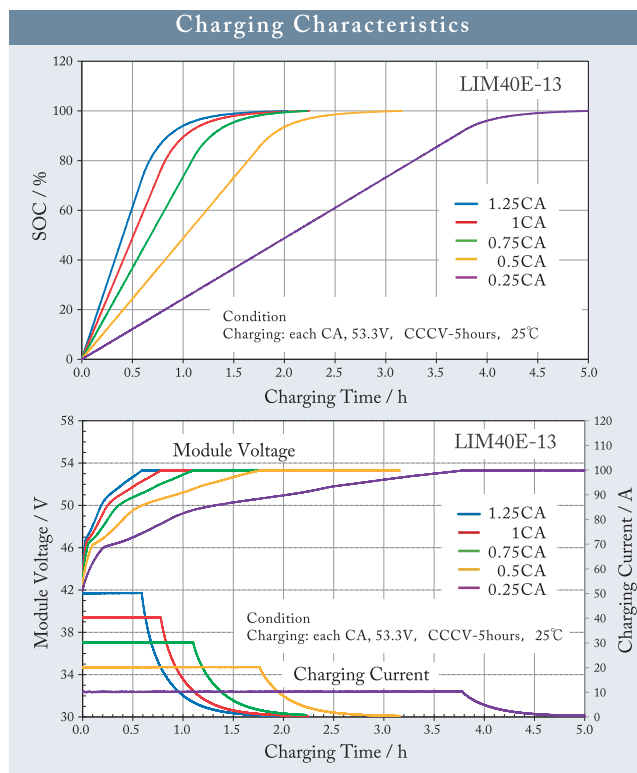
*DOD@100%, Temp 25 Deg C
The data is for reference purposes.
Actual performance varies by condition



	LIM40E-13	LIM40E-14
The number of cells	13	14
Nominal Capacity (Ah)	40	
Nominal Voltage (V)	48.8	52.5
Max Charging and Discharging Rate (C)	1.25	1.25
Ambient Temperature (C)	- 20 Deg C ~ + 50 Deg C	
Weight (kg, lbs)	27kg 59.52lbs	29kg 63.93lbs
Dimension (L×W×H / mm, in)	362 × 435 (480) × 130 mm 14.25 × 17.12 × 5.11 in *3U	
Multiple Connection	MAX 32 units (*1,280Ah)	
User Interface	3 ch CAN 2.0B 1ch RS-485 1ch	
- dry contact		
- communication 1		
- communication 2		

Applications

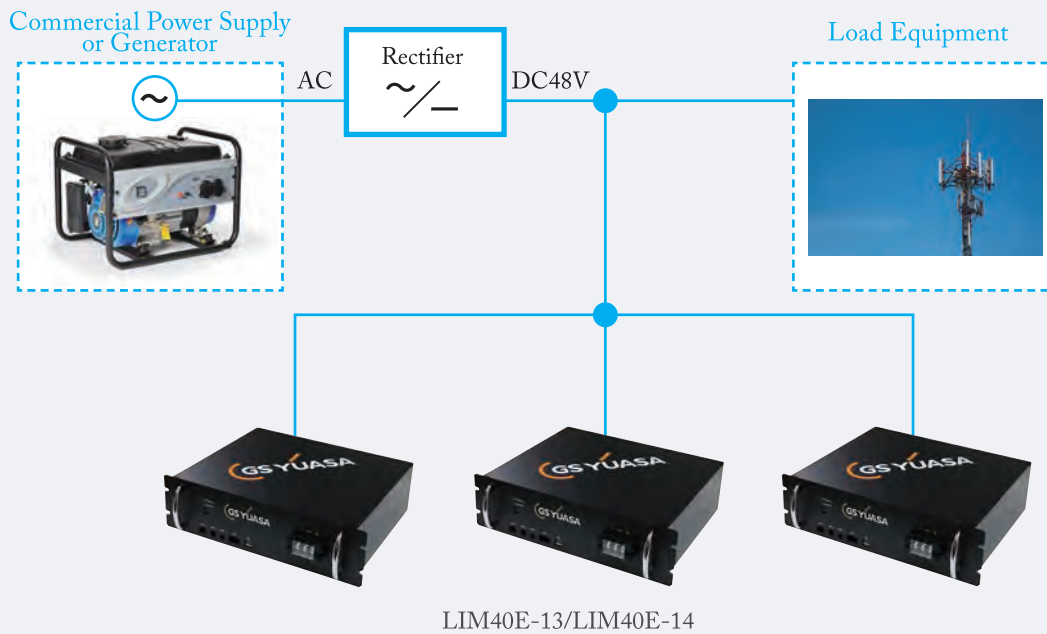
- Telecom
- CATV
*Community Antenna TeleVision
- BTS
*Base Transceiver Station



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System Design

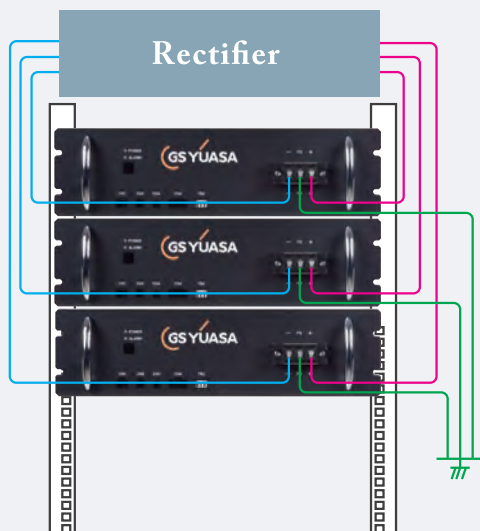
LIM40E-13/14 is a high performance lithium ion battery module designed for Telecom use. LIM40E-13/14 has outstanding cyclic life and can charge at 1.25C thus reducing the Total Cost of Ownership (TCO) in regions with unreliable or unavailable grid conditions.



Installation image

LIM40E-13/14 can be mounted onto a 19 inch rack making installation and maintenance easy. In addition, using LIM40E-13/14 will save space and have less weight compared to lead acid batteries. Battery capacity can be flexibly increased to match customer needs by connecting multiple modules in parallel.

Wiring



An example of Implementation
in 19 inch Rack



Installation Record

Telecom

Quewave SA / Vodafone Egypt

*End User is Vodafone Egypt. The Batteries have been supplied by our local partner Quewave, SA.

Application : Backup for Base Station

Capacity : 25kWh

Operation Start Date : July, 2016



True Corporation Group

Application : Backup for Cable TV

Capacity : 2kWh

Operation Start Date : October, 2015

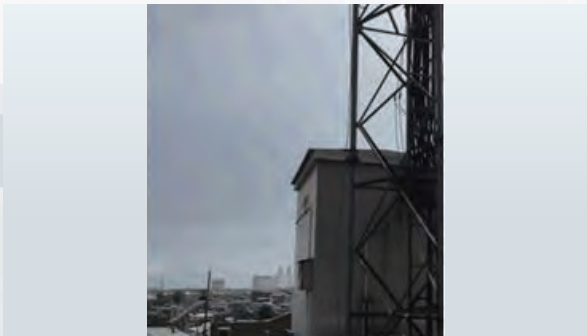


Axiata Group

Application : Backup for Base Station

Capacity : 12kWh

Operation Start Date : September, 2016



Industrial Equipment

ZPMC

Application : Automatic Guided Vehicle

Capacity : 316kWh/vehicle

Operation Start Date : Jan, 2017



Japan Freight Railway Company

Application : Train

Capacity : 67kWh

Operation Start Date : February, 2012



Sumitomo Heavy Industries Material Handling Systems. Co.,Ltd

Application : Transfer Crane

Capacity : 14kWh/crane

Operation Start Date : July, 2017



Energy Storage

Tokyo Tama Intercity Monorail Co.,Ltd.

Application : Regenerative Power Absorption/
Emergency Running
Capacity : 75kWh(Power Absorption),
202.46kWh(Emergency Running)
Operation Start Date : July, 2016



Parker Hannifin Corp.

Application : Energy Storage
Capacity : 5MWh
Operation Start Date : Oct, 2016



Chugoku Electric Power Co.,Inc.

Application : Output Fluctuation Regulation
for Renewable Energy
Capacity : 1,350kWh
Operation Start Date : September, 2015



TOBU Railway co.,Ltd

Application : Regenerative Power Absorption
Capacity : 104kWh
Operation Start Date : October, 2016





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