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TECHNICAL
DOCUMENT

Communication solution
for Utility Scale Station



Comparing to the C&I or residential PV station, Utility Scale Station is quite different application, it has more equipment, more complicated communication plan, longer communication distance etc. Based on which, GoodWe provides a solution especially for Utility Scale Stations.

There are two ways of communication, PLC and RS485.

PLC (Power line Communication), is generally used in utility scale station and some large industrial and commercial PV projects. It uses AC cables as communication carriers, which can save the cost and installation work of communication cables, and improve the reliability and maintainability of power station communication. It is a reliable power station communication solution.

Based on PLC communication technology, GoodWe optimize and upgrade the PLC from 1.0 to 2.0, and to the current HPLC. The HPLC communication adopted the latest modulation chip, which makes it equivalent rate faster and can reach 200kbps. At the same time, it also has CSMA function, which can prevent the crosstalk, the theoretical maximum communication distance can reach 1000m. To ensure faster and more stable communication, all GoodWe 1500V series inverters is upgraded to HPLC.

RS485 communication adopts serial communication bus technology, and uses shielded twisted pair wire as communication carrier to connect inverter, weather station, measurement and control device of MV station and other third-party equipment. The default communication rate is 9.6kB/s, and the maximum transmission distance is 1200m.

The optical fiber ring network communication connects each optical fiber terminal box to form a ring network through optical fiber, the optical fiber ring network switch is connected to the datalogger through the Ethernet cable. The use of fiber ring network communication can prevent the failure of one connection and affect the whole network, so that the network is in redundancy, so that the data received by the main station will not be affected, and there will be no communication break and data loss. And the relative transmission rate of optical fiber is faster, and the transmission distance can reach more than 20km.

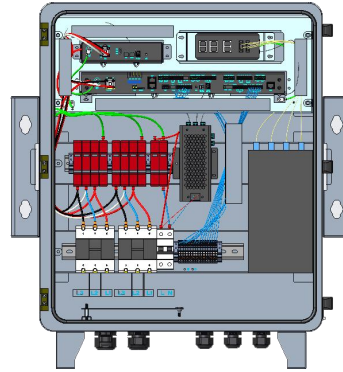
GoodWe provides different types of intelligent communication boxes for utility scale stations and large industrial and commercial power stations, which can meet different application in the whole scenario.

1. Smart Communication Unit, SCU3000A series

1.1 Product layout



SCU3000A Outline



SCU3000A Internal View

1.2 Function introduction

SCU3000A equipped 1 or 2 (for option) HPLC ports, 8 RS485 ports, 2 LAN ports, 8DI, 4DO, 8AI and PT100/PT1000. Also it has a Ethernet & Fiber switch with 2 fiber ports and 6 Ethernet ports, and there's 24 core fiber splice box.

The SCU3000A supports various communication way with inverter, like HPLC and RS485. The RS485 is also compatible with third party equipment like weather station, meter and measurement & control device of MV station. To inverter and third party equipment, it supports Modbus RTU. To SCADA side, it supports IEC 104, Modbus TCP and Goose with LAN port.

2. Type of SCU3000

We have 2 different types for different application

Function	SCU3000A-S	SCU3000A
PLC	1 (HPLC)	2 (HPLC)
RS485	8	8
LAN	2	2
Switch	1	1

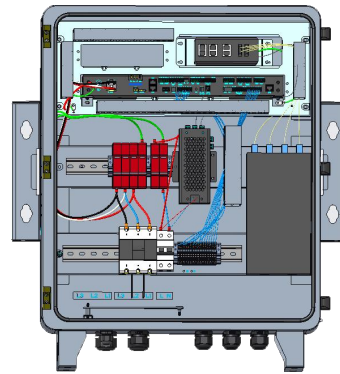
Inverter	GW250K/KN-HT GW350K/KH-UT	GW250K/KN-HT GW350K/KH-UT
Application	1 LV winding transformer	2 LV winding transformer

2.1 SCU3000A-S

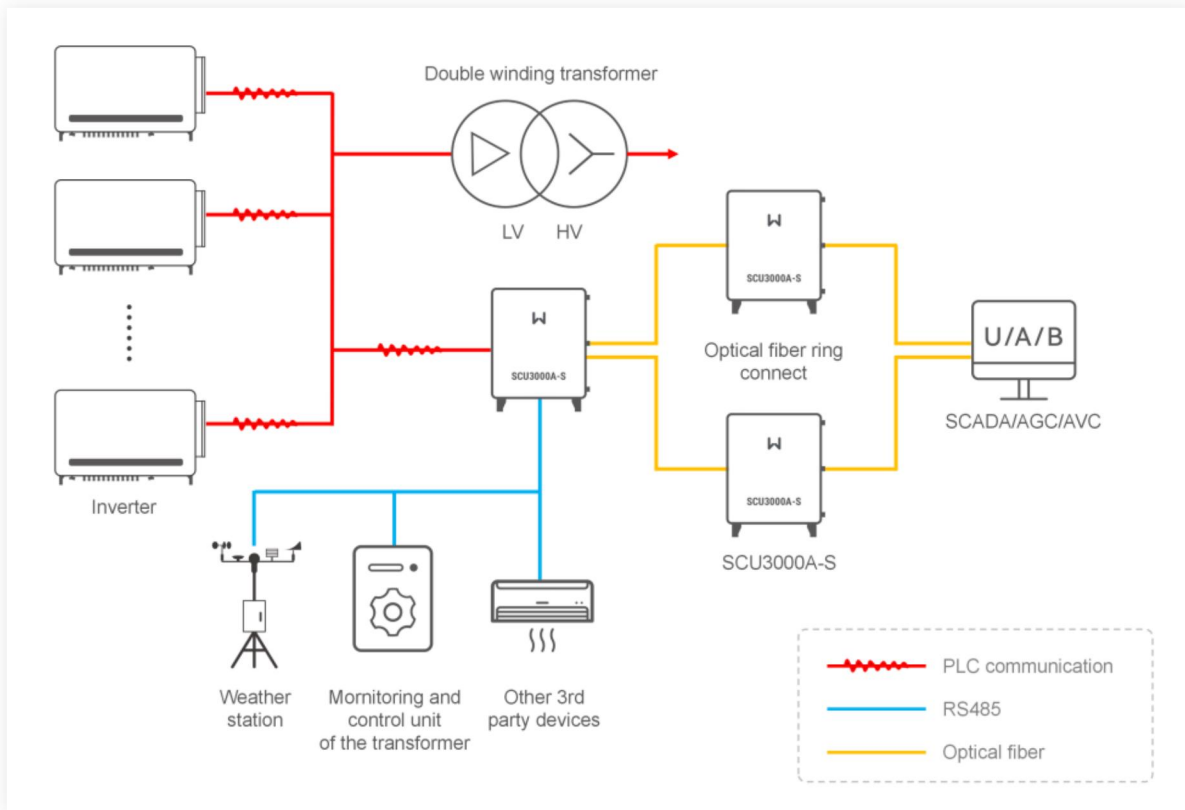
SCU3000A-S is applicable for GW250K/KN-HT and GW350K/KH-UT inverter with 1 PLC communication.



SCU3000A-S Outline



SCU3000A-S Internal View



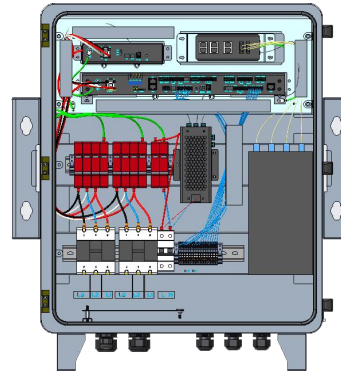
SCU3000A-S Communication plan

2.2 SCU3000A

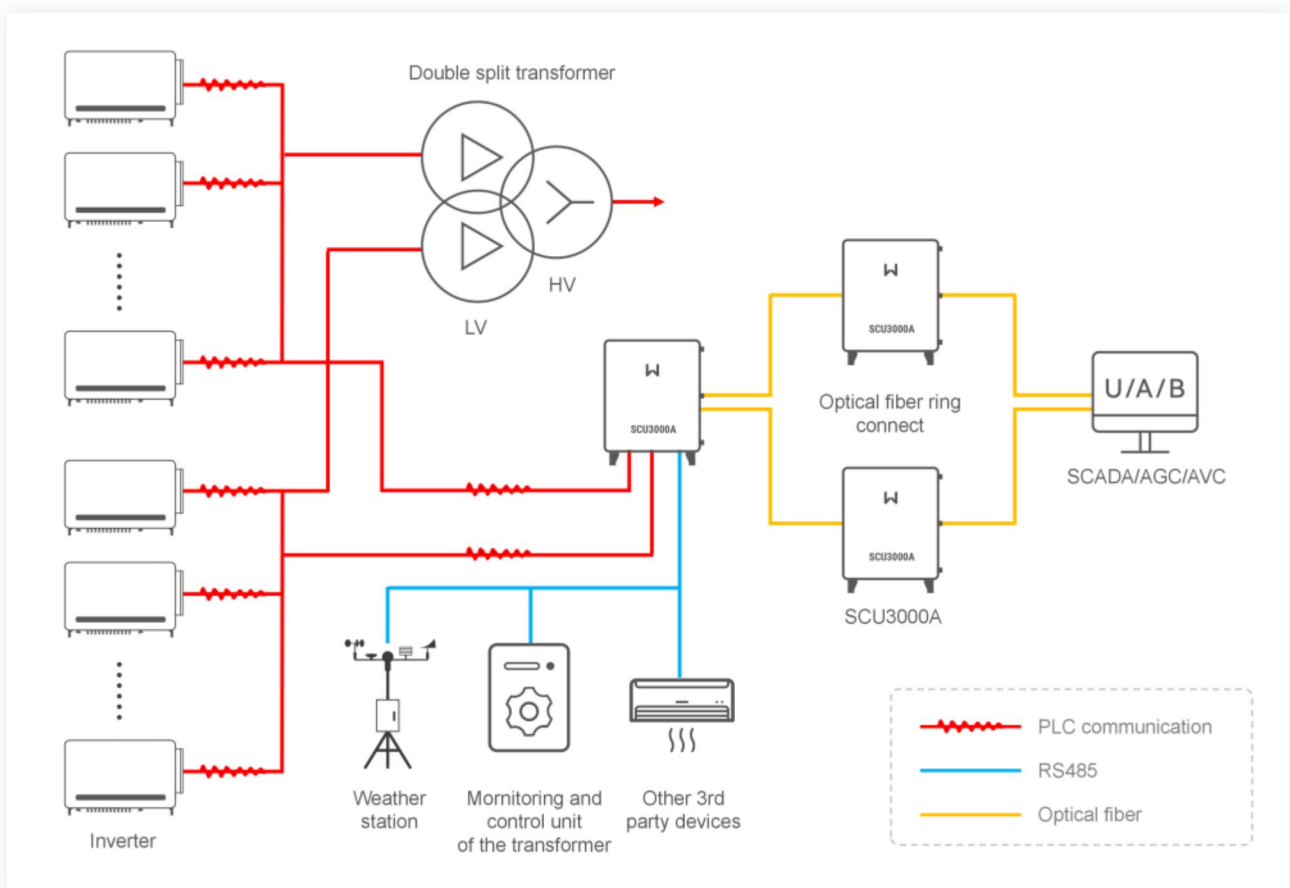
SCU3000A is applicable for GW250K/KN-HT and GW350K/KH-UT inverter with 2 PLC communication.



SCU3000A Outline



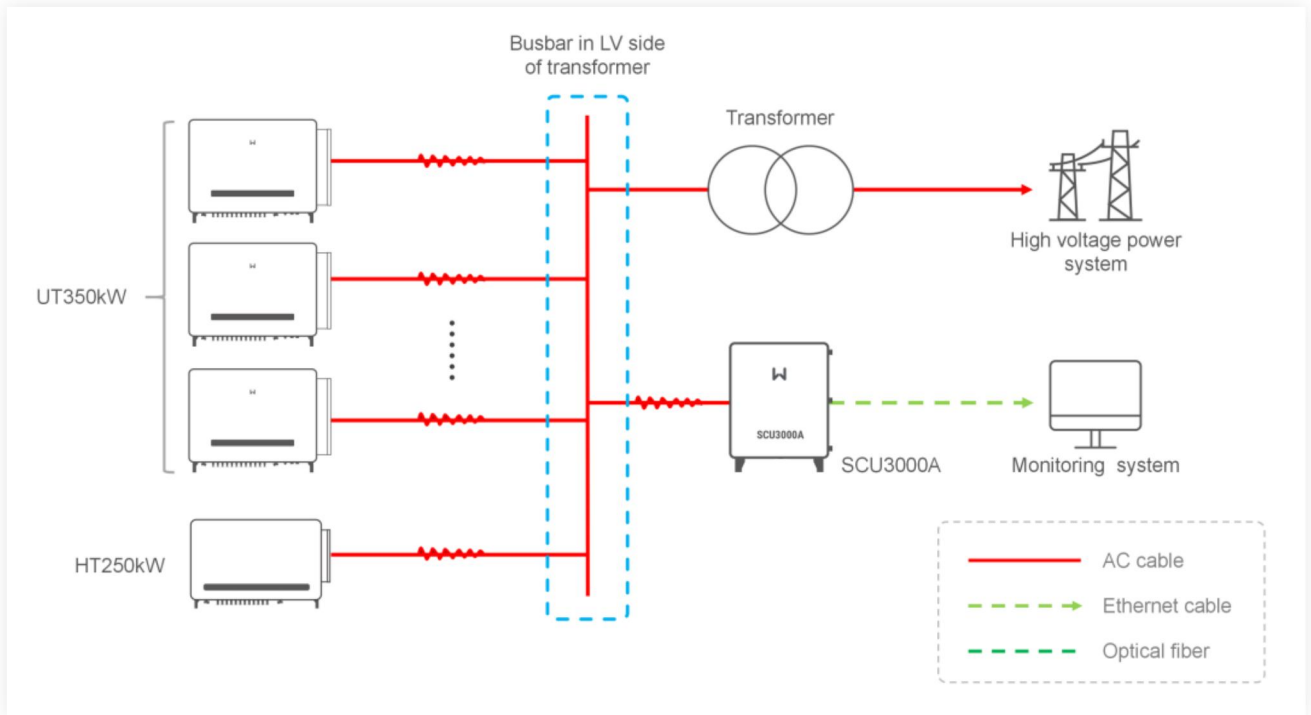
SCU3000A Internal view



SCU3000A Communication plan

3.Special application

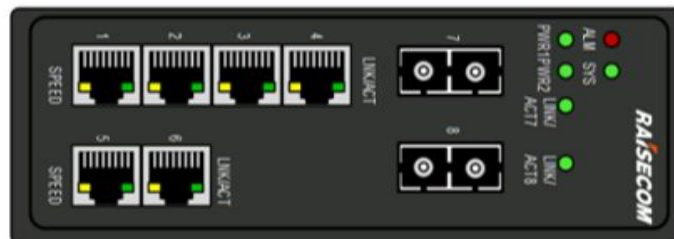
Since the 250kW inverter and 350kW inverter both using HPLC, for mix using 250kW and 350kW inverter in one station, we have following solution.



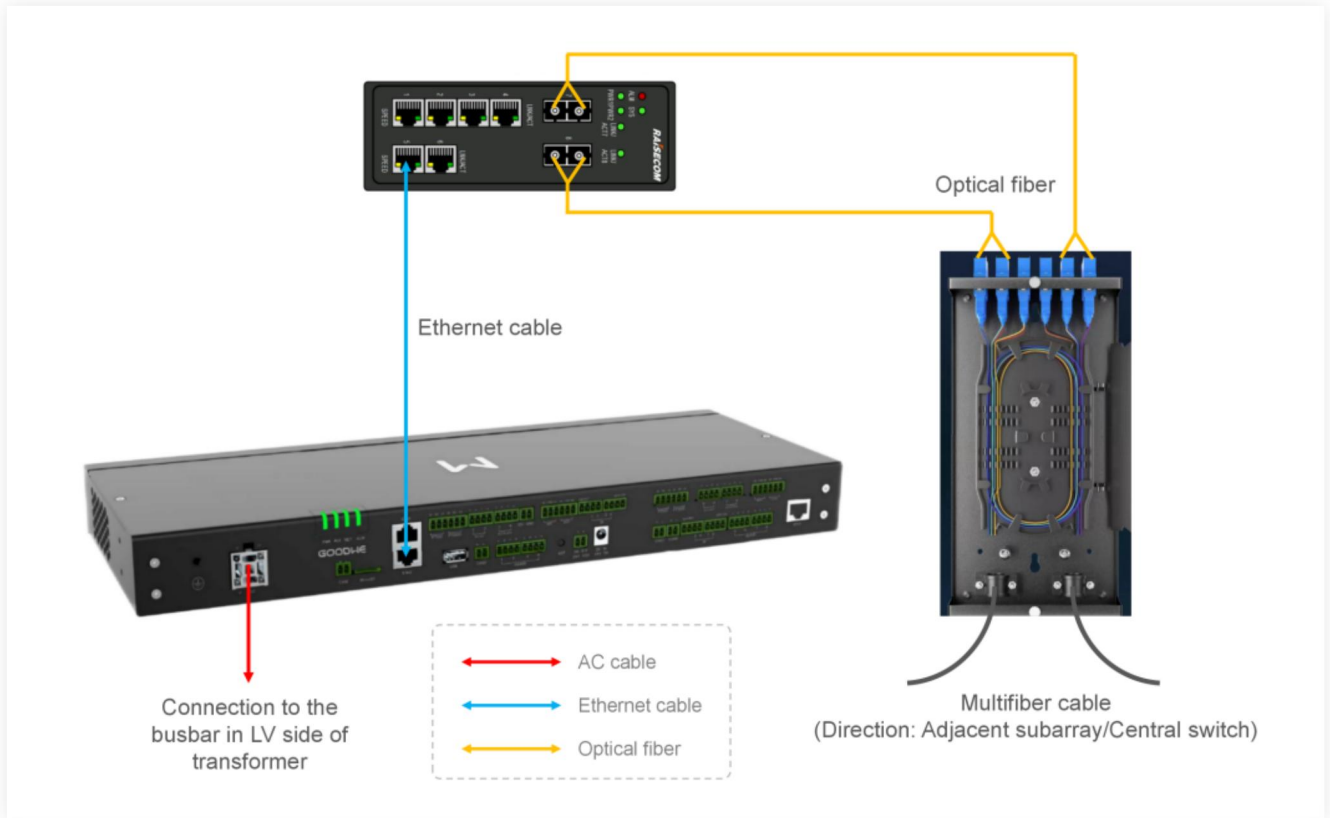
Application of mix using 250kW and 350kW inverter in one station

4.Fiber ring network

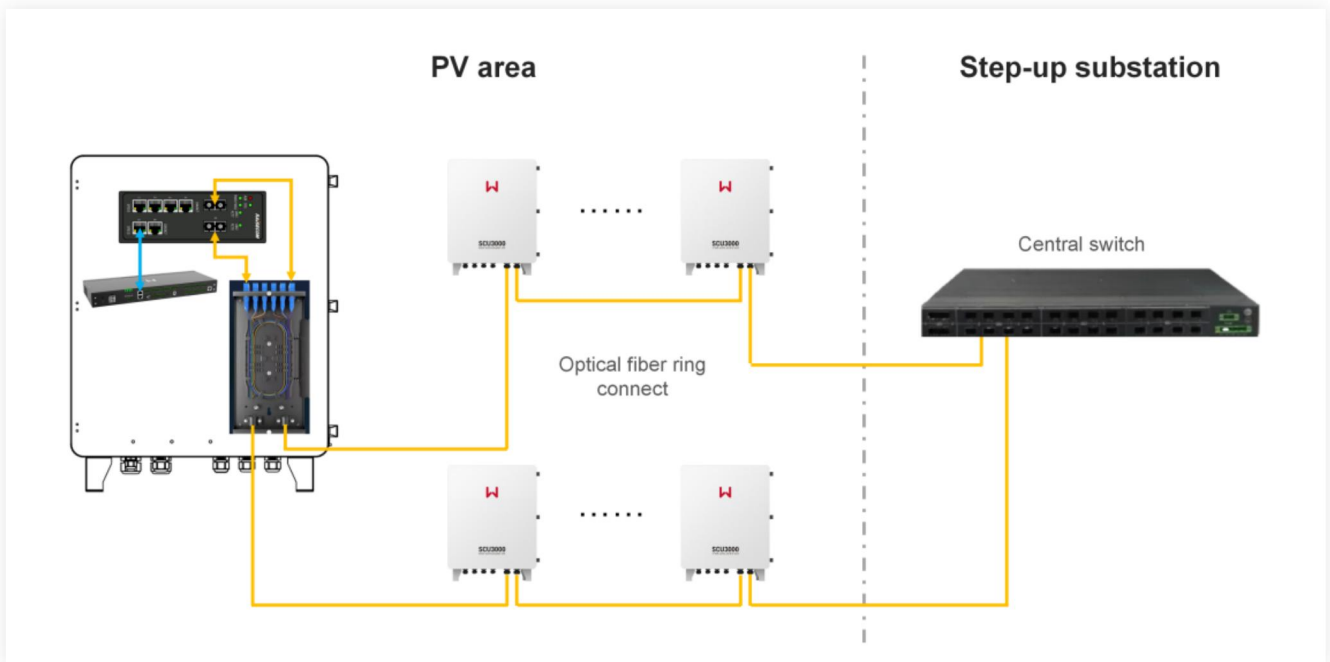
SCU3000A series communication unit equips Fiber & Ethernet switch with 2 fiber ports and 6 Ethernet ports. The network plan is as following.



Fiber & Ethernet switch



Wiring diagram



Fiber ring network diagram

GoodWe provides different communication unit for different application, which can cover the major communication plan. Besides, the SCU3000A series communication unit equipped with Fiber & Ethernet switch, so that customer doesn't have to purchase additional switch. We provide a complete set of solutions for various communication modes of PV station, making on-site construction and commissioning more efficient and convenient. Truly achieved a set of products to solve all the pain points in photovoltaic power station communication.

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