Smart G4 Climate Control Solutions

Heating Ventilation and Air conditioning control

Rev.1


G4
Best Climate Control Solutions

Smart Building Climate Control

Smart Building climate control is that which is capable to control and monitor of total air and temperature support systems with minimum energy loss like:
Heating
Ventilation and air quality
Air-conditioning
dry stores, cold stores and freezers environment
as well as harvesting for green building effect.

Climate contributes to happiness

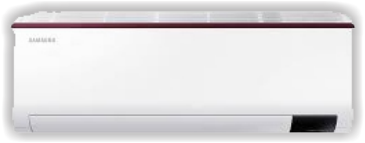
In This Document

- Air Conditioning Types and How to Control and monitor
- Heating Types and How to Control and monitor
- Smart G4 Products for Climate control
- Ventilation and Air Quality
- Energy Saving and Triggers
- Connection Diagram Examples and Wire Pinouts

Ceiling Fan Speed

Window AC
Manual Knobs

Window AC
W/ IR Remote



Wall Split AC
W/ IR Remote

Mister Coooler

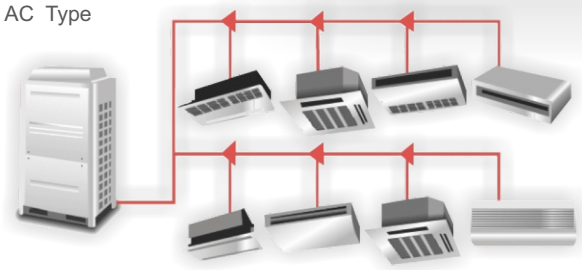
Types of Air-conditioner Technology G4 can Control

Ceiling Cassette
Split AC
W/ IR Remote

Desert Cooler
Water Cooled

Split AC Stand
W/ IR Remote

VRV-VRF
AC Type



AHU AC

FCU AC

VAV Damper

Package AC

Air Conditioning Types

System Type	Minimum needed control / Maximum Control options	G4 Solution Module
Ceiling Fans	(Fan Speed presets with motor noise reduction technology)	Fan speed
Desert Cooler	(On/Off, 3Fan Speed, Water Pump, Drain, Filter Alert, water level alert)	R12, Gladiator, HVAC
Manual Window AC	(Simple On/Off, Filter reminders)	R12
IR Controlled window AC	(On/Off, Temperature, Fan Speed, Sway, Fresh air Vent, Filter alert)	IR, 5IR2Z, IPIR, 9in1
Cassette Type split AC	(On/Off, Temperature, Fan Speed, Sway, Fresh air Vent, Filter alert)	IR, 5IR2Z, IPIR, 9in1
Package	(On/Off, Temperature, Fan Speed, Filter alert)	HVAC
VAV	(On/Off, 0-10V Damper control, Filter alert, Pressure shut off)	1B0-10V, 6B0-10V, 12R
FCU ducted	(On/Off, Temperature, Fan Speed, Cool, Heat, Filter alert)	HVAC, Gladiator, 12R
AHU	(On/Off, Temperature, Fan Speed, Cool, Heat, Fresh air, Filter alert)	HVAC, Gladiator, 12R
VRF, VRV	(On/Off, Temperature, Fan Speed, Cool, Heat)	CMBridge, KNX-Bridge
Misters Coolers	(On/Off, Fan speed, Pump control)	R12

Water
R12/Freon
Amonia

Kindly refer to Diagrams and recommendation

Types of Heating Technologies G4 can Control





Heating Types

System Type	Minimum needed control / Maximum Control options	G4 Solution Module
Underfloor electric Coil	(On/Off)	R12
Hot Water or Oil Radiated	(On/Off, Impulse)	R12
Radiated (Gas or Bulbs or Coil)	(Crank, On/Off, Optional Fan Speed, Direction)	IR, R12
Manual Window AC W/Heater	(Simple On/Off, Filter reminders)	R12
IR Controlled window AC W/Heater	(On/Off, Temperature, Fan Speed, Sway, Fresh air Vent)	IR, 5IR2Z, IPIR, 9in1
Cassette Type split AC W/Heater	(On/Off, Temperature, Fan Speed, Sway, Fresh air Vent)	IR, 5IR2Z, IPIR, 9in1
Package W/Heater	(On/Off, Temperature, Fan Speed, Filter alert)	HVAC
VAV W/Heater	(On/Off, 0-10V Damper control, Filter alert, Pressure shut off)	1B0-10V, 6B0-10V, 12R
FCU ducted W/Heater	(On/Off, Temperature, Fan Speed, Cool, Heat)	HVAC, Gladiator, 12R
AHU W/Heater	(On/Off, Temperature, Fan Speed, Cool, Heat, Fresh air)	HVAC, Gladiator, 12R
VRF, VRV W/Heater	(On/Off, Temperature, Fan Speed, Cool, Heat)	CMBridge, KNX-Bridge
Mirror and Towel Heating	(On/Off)	2R, 12R

Water
Oil
Air

Kindly refer to Diagrams and recommendation

OUR CLIMATE CONTROL PRODUCTS CAN!

MONITOR - CONTROL - ENERGY SAFE

IMPROVE COMFORT - CONTRIBUTE TO HEALTH & AMBIANCE

Over 60,000 Devices
full Monitoring and Control
in a single network (Expandable)

Take a Glance
Smart G4 Climate Control Products

FCU/ AHU Package and Desert Cooler control (HVAC Module)

SB-HVAC2-DN

SB-HVAC4-DN


SB-HVAC4-DN

Ready To connect to 3rd Party Standard Thermostat with NO/NC Connection contactors

Features

HVAC Module by G4 is a state of art control and monitoring device this can control and monitor 1 zone and has the following features:

- Cool - Heat - Humidate/ Dehumidate - Fresh Air
- VAV Damper control 0-10V and On/Off
-Return Duct Temperature monitoring
-3 Fan Speed Control (L - M - H)

HVAC4 added features like:

- Eco function
- On Board Preset control (Cold, Cool, Warm, Heat)
- On Board fast override buttons to test and control Fan speed & Modes
- Third Party Thermostat Parallel Bridging so can use the thermostat as the user interface, and can override it for energy saving + using HVAC3

Control Flexibility

- Smart G4 HVAC modules can control upto 60,000 FCU/AHU/AC in one single Building. over distance of up to 1-3 Kilometers of cable length
- It can operate automatically by logic
- It can be operated and controlled by users:
  - From wall Panels
  - From APP
  - From Software
  - By SMS message
- It can be controlled by triggers and events like:
  - Opening of Door or window
  - Reaching to Temperature High or Low
  - More people entered the Zone space
  - Outside temperature and time lag
  - Air quality limit reach or other

Usage:

HVAC Modules are champions in control of the following Type of Climate Machines and devices:

- Desert Cooler AC Type
- Package AC Type
- FCU AC Type
- AHU AC Type
- VAV Damper Control

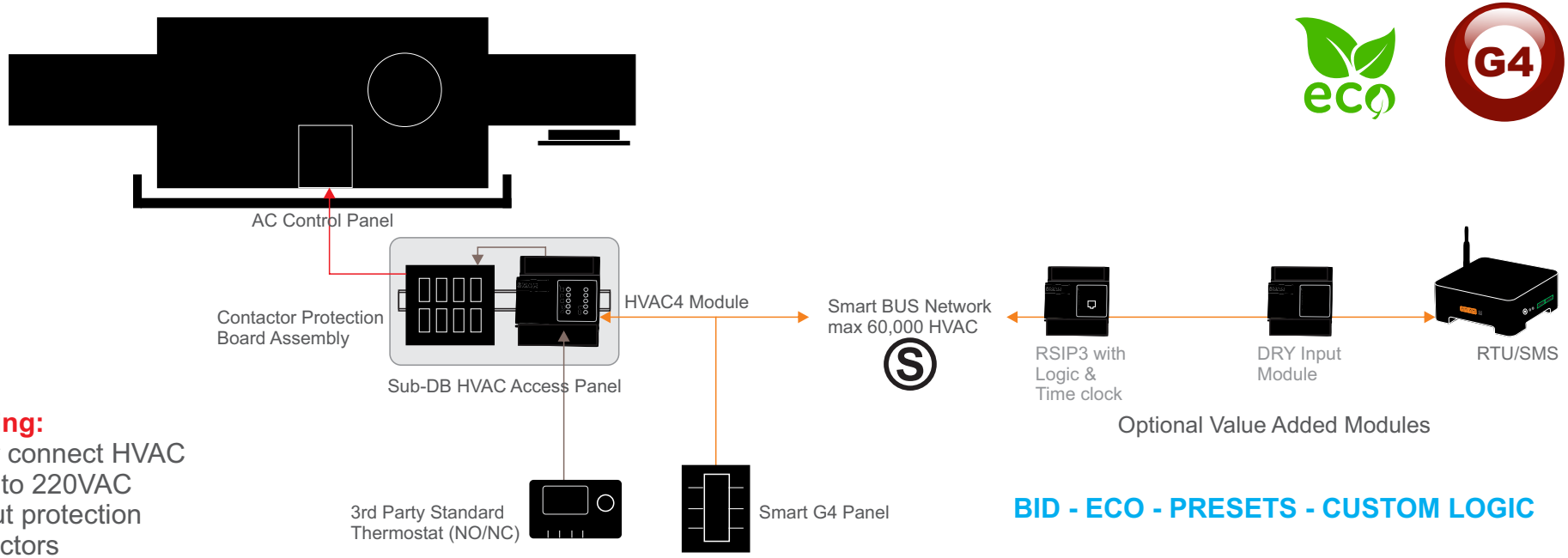
-Eco Mode
-Off or change mode if Terrace open long
-Presets and schedules


SB-HVAC3-DN

HVAC3 added features like:

- Eco function
- On Board Preset control (Cold, Cool, Warm, Heat)
- On Board fast override buttons to test & control Fan speed & Modes

HVAC Module Connection Diagram



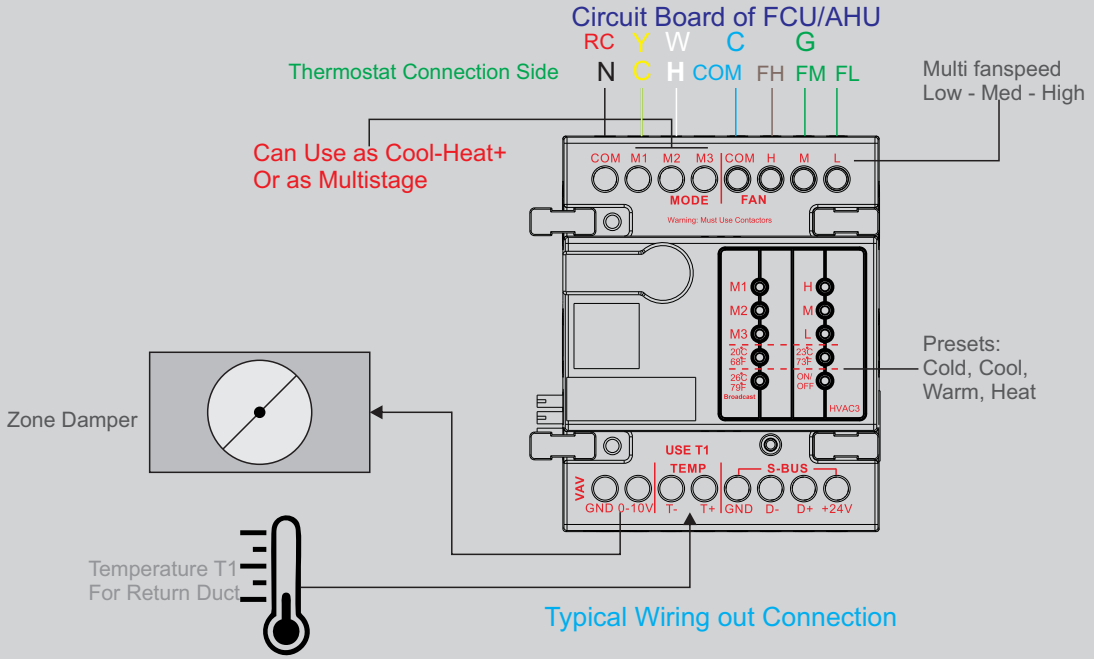
Warning:
Never connect HVAC direct to 220VAC without protection Contactors

BID - ECO - PRESETS - CUSTOM LOGIC

This Diagram:

Typical Connection Diagram of HVAC4 to FCU / AHU / Desert Cooler / Package Unit and To VAV Dampers Note: (0-10V Dampers do nor require Contactor protection)

Note: HVAC2 and HVAC3 has same exact connection Except the Third Party Thermostat manual override



VAV Damper Control Products

for both Adjustable 0-10V and Open/Close Damper types

SB-1B0-10V-TC

Features: SB-1B0-10V-TC

Distributed Technology that Allows unlimited Damper Connection and addition on the go. (1 Damper per module)

0-10V Control and On/Off Power Control for Open/Close

4Dry Contacts allows Connection to Standard Thermostat for presets Like: Cold - Cool - Warm - Off

Features: SB-6B0-10V-DN

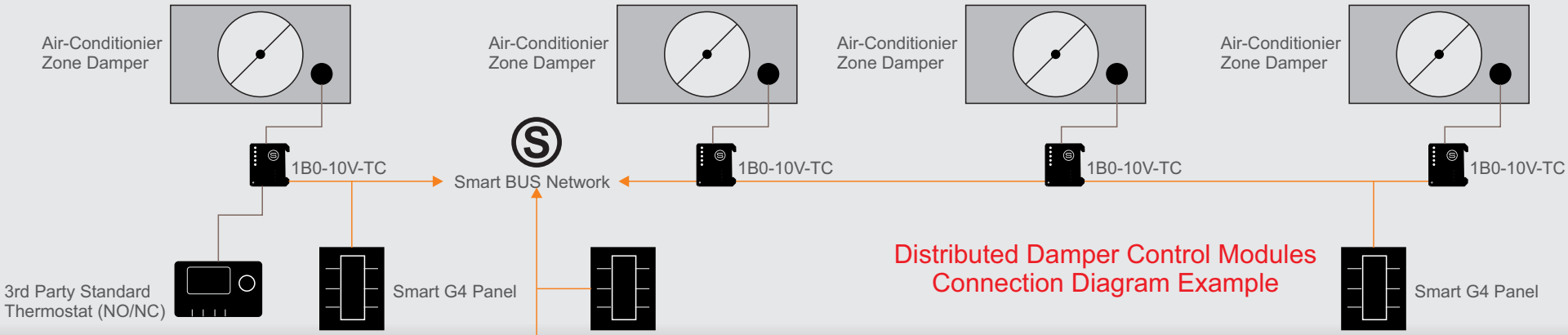
Centralized Damper Control (6 Dampers per module)
Can add more modules as needed

0-10V Control and On/Off Power Control for Open/Close

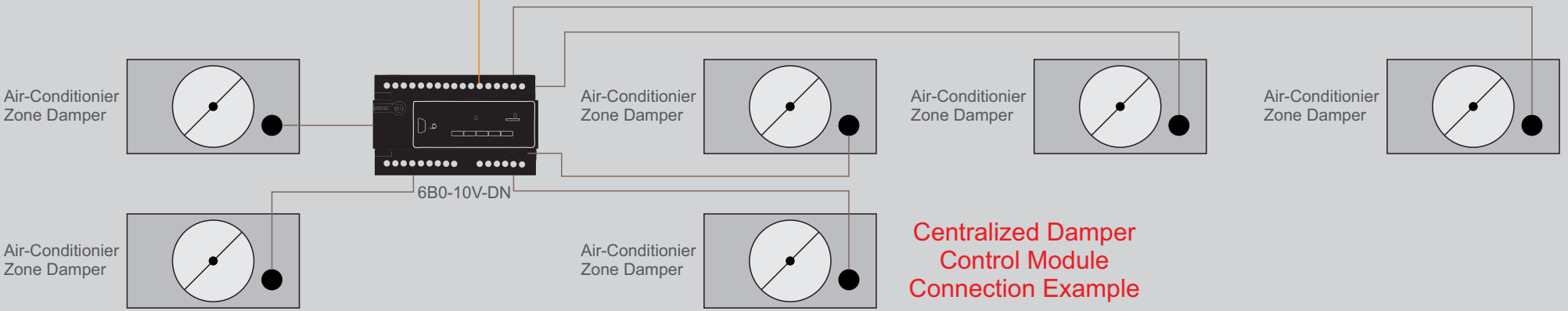
Can be controlled from any Smart G4 Panel, and can add 4Z/24Z to integrate to third party NO/NC thermostat presets.

VAV Damper Control Connection Diagram

More economical solution compared to using HVAC



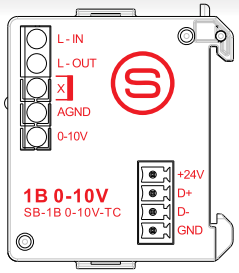
Distributed Damper Control Modules Connection Diagram Example



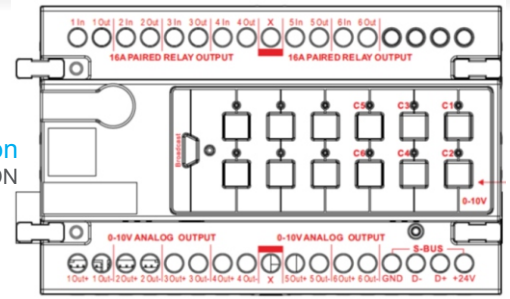
Centralized Damper Control Module Connection Example

VAV is: Variable Air Volume system

Typical Wiring out Connection
SB-1B0-10V-TC



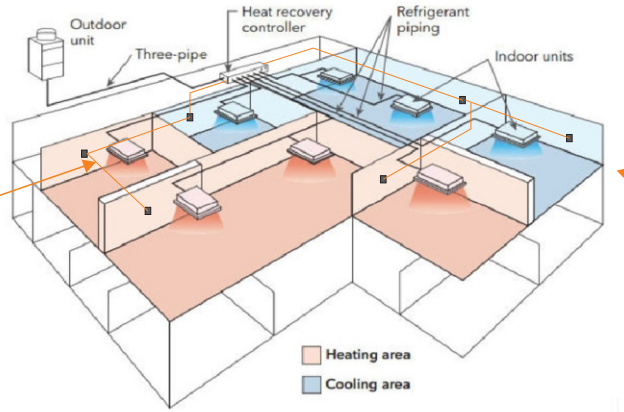
Typical Wiring out Connection
SB-6B0-10V-DN



VRV/VRF G4 Control Products

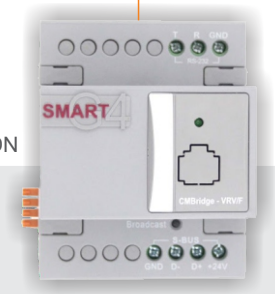
4 Methods G4 Can fully control the latest VRF/VRV HVAC systems (First 2 Methods)

CoolAutomation.com
VRF/VRV Gateway
third party



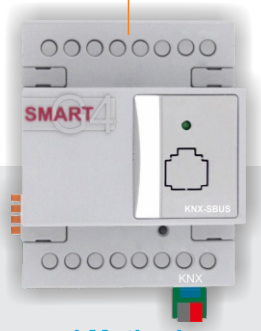
intesisbox.com
VRF/VRV Gateway
third Party

SB-CMBridge-DN



SB-DTPu-DN

SB-KNX-DN



First Method
Using Cool Master Gateway
and CMBridge By G4

Second Method
Using KNX Gateway
and KNX-Bridge By G4

Smart G4 VRV/ VRF Control Via Gateways

Theses Methods allow both control and
monitoring of 1-64 Indoor units
using single Smart G4 Bridge

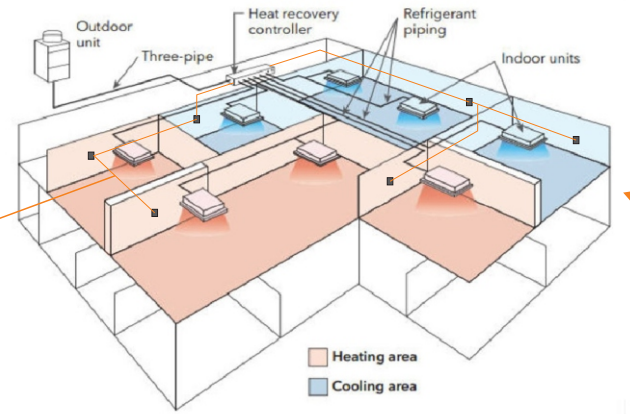
This integration is done fast thanks to the gateways that are ready with
connection ability tobothVRV / VRF System and Smart G4 Bridges

VRV is: Variable Refrigerant Volume system

VRF is: Variable Refrigerant Flow system

VRV/VRF G4 Control Products

4 Methods G4 Can fully control the latest VRF/VRV HVAC systems (Second 2 Methods)



Manufacturer Infra Red Receiver Moddule

SB-IR-UN
SB-IRM-UN

SB-DTPu-DN

Boilers

RS-485 Interface or ModBus Gateway third Party

SB-RS232-DN
SB-RSIP2-DN
SB-RSIP3-DN

Third Method
Using Infra red Receiver Gateway with IR emitter of G4

Forth Method
Using RS-485 Modbus /RS-232 with RSIP2 of G4

Smart G4 VRV/ VRF Control by IR
The IR Method is the simplest and is good for small structures that has limited quantity of indoor units. (Economical)

Smart G4 VRV/ VRF Control by Protocol
The protocol integration Method is an advanced methos that can be used whenever possible provided that VRV/VRF sys. manufacturer provides the protocol document and the interface support.

Such integration can be done via MODBUS, RS-485, or RS-232 according to manufacturer interface

Impulse and Open/Close Climate Control Products

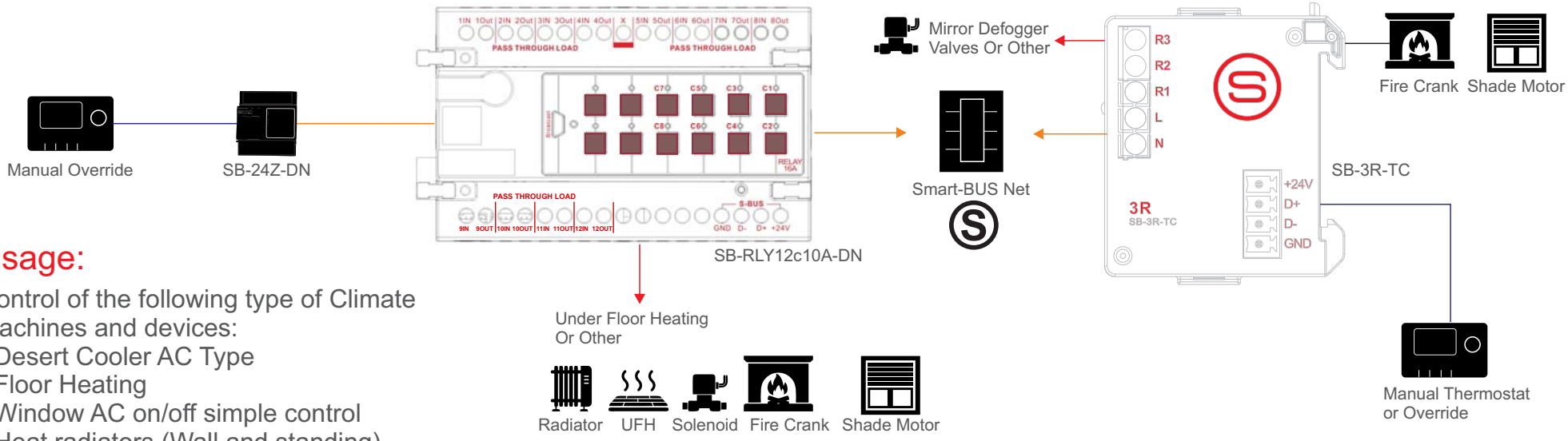
For Floor Heating, Radiator Systems, Towel Heaters, Mirror Defoggers, and Simple AC on/Off

G4

SB-RLY12C10A-DN

SB-1R-TC
SB-2R-TC
SB-3R-TC

SB-2R-UN



Usage:

Control of the following type of Climate Machines and devices:

- Desert Cooler AC Type
- Floor Heating
- Window AC on/off simple control
- Heat radiators (Wall and standing)
- Towel heaters
- IR Heaters
- Mirror de-foggers
- Fire Place Cranking

Shades for Climate Control

The Relay Actuators can also be used to Harvest energy from sun or to protect from it by opening/ Closing Shades which helps HVAC efficiency and assist in saving energy

Our Unique Relay Actuator Devices

Our Smart relays are designed to work with climate control systems by impulsing and triggering on/off the function based on day night, away, and the scheduled timers and events

HVAC Infra Red Control

Smart G4 Provides at Least 5 Solutions for IR Control

SB-5IR2Z-UN

SB-5IPIR-SL
SB-IPIR-SL

Controls 5 IR Devices
50 IR commands/Device
32 Lines of Logics
2Dry contacts Occupancy
and Infiltration

SB-IR-UN

SB-IRM-UN

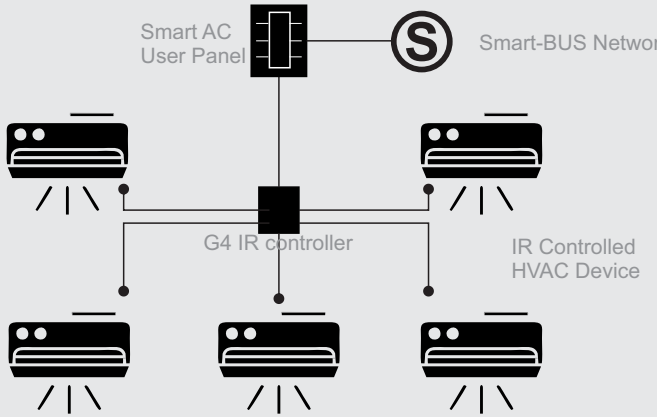
Controls 1 IR Device
250 IR commands/Device
Built in Current Sensor

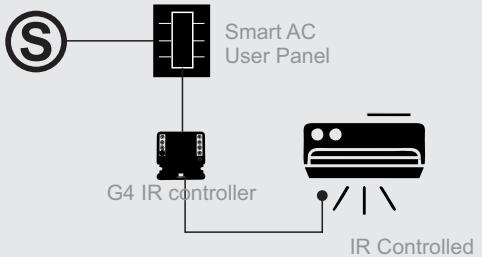
SB-9in1T-CL
SB-8in1T-CL

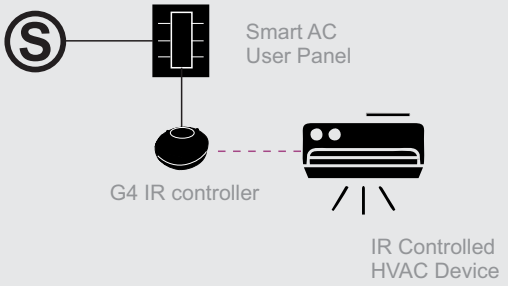
Controls 1 IR Device
250 IR commands/Device
32 Lines of Logics
2Dry contacts Occupancy
and Infiltration + Temp Sensor

SB-9in1T-CL
SB-8in1T-CL

Controls 6 IR Device
250 IR commands/Device
W/ Current sensors input







Brief

50-250 IR Codes Per HVAC Device
1-5 HVAC Devices control Per 1 G4 Module
Complete afford ability

Features

Smart BUS Infra Red Modules, Learns and Stores IR codes in its internal memory Then those Codes are emitted via flashers to the HVAC Device.

Being part of smart bus network gives the IR emitting devices cutting edge abilities and limitless applications in th efield of energy saving, comfort and control.

The Gladiator 8 and Gladiator 16

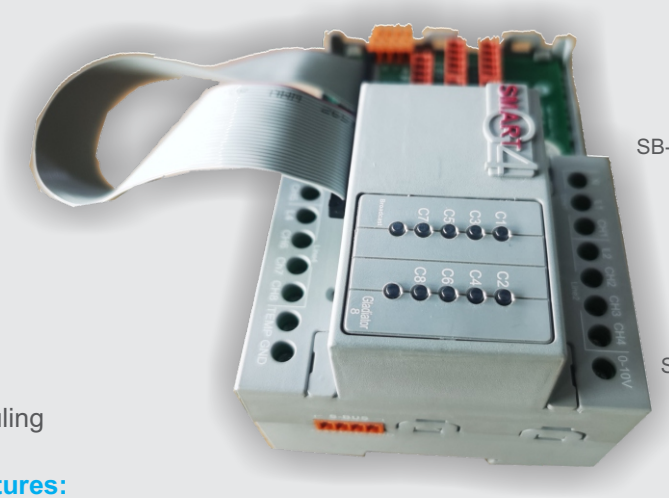
When you need Floor heating with one or two FCU/AHU controls

SB-Gladiator16-DN

With Gladiator 16 you can control
2 units of AHU FCU + 2 VAV +
up to 8 Heating Zones

Unique Ability
Built-in Logic control &
Time clock and scheduling

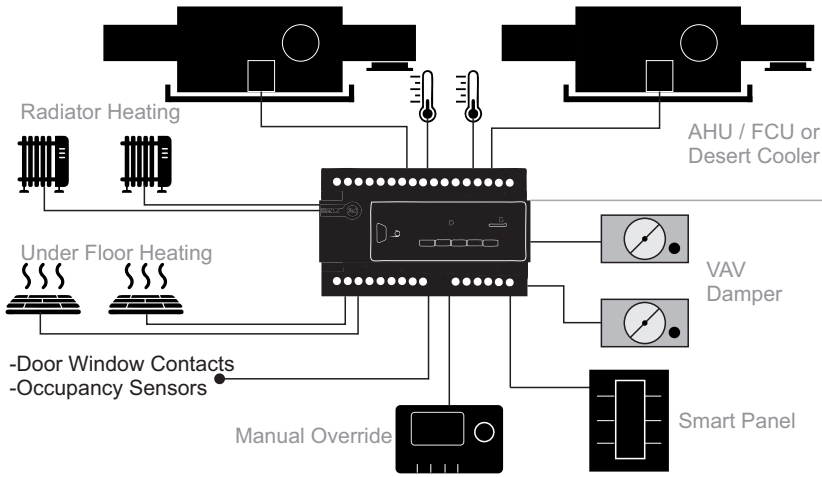
Same as HVAC4 Features:
-Built in Temp sensors
-On Board Control
-On Board Presets
-On Board Override connection
to third party Thermostat
and many Sensor inputs

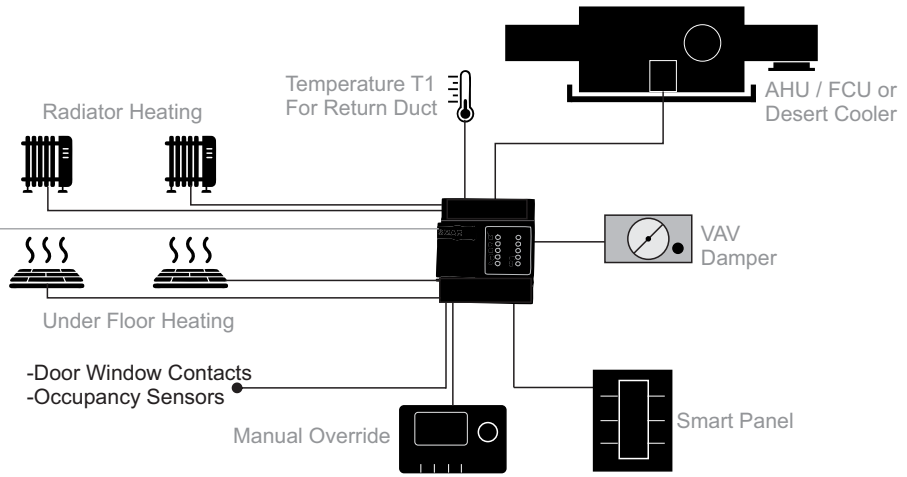


SB-Harness-DN

SB-Gladiator8-DN

With Gladiator 8 you can control
1 unit of AHU FCU + 1 VAV +
up to 4 Heating Zones





Temperature Monitoring and reading

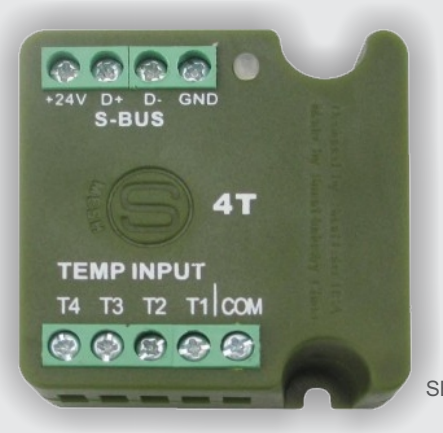
Water, Supply air, Return air & Indoor/ Outdoor Temp

4T Temp sensor

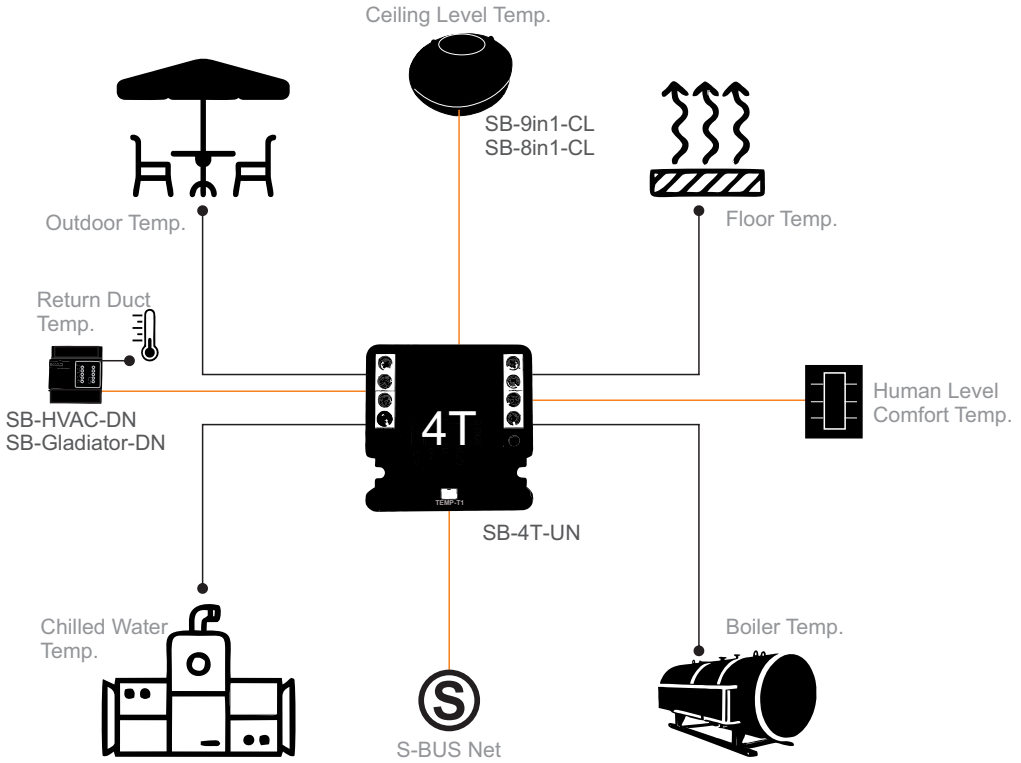
Smart G4 HVAC System collects Temperature from several sources, calculates and averages between then. and prepare for time lag effect

G4 has many devices that collects temperature like:

-Return Air Duct temperature **(All HVAC Modules)**
-Ceiling Level Temperature **(9in1/8in1)**
-Floor level Temperature **(4T)**
-140cm High (human comfort) Temperature **(User Interface Panels)**
-Outside (Outdoor) temperature **(4T/ Weather Station mini)**
-Chilled Water or Boiler water Temperature **(4T)**



SB-4T-UN



4T and T2 are also used for Swimming Pool, Jacuzzi, sauna and wine cellar Temp. monitoring

Note: Please use T2 Probes with 4T Module

Add 4T to Mini-IO and Monitor all requirements in Cold Stores, Dry Stores, Freezer Stores. Use Relay actuators, Zone-audio and SMS to Send Audible and visual alerts to safe both products and People lives trapped.

Ceiling fan Speed Control

With noise reduction speed presets

SB-6FAN5S-DN

Features

Smart G4 provides special ceiling fan speed attenuator
This Fan Speed module has ability to control 6 Separate Fans
Each can have 5 Speed Presets that are adjustable to match
motor noise reduction positions.

Applications

This product can also be used in Checken farming
and in other industries that require variable speed preset control

Enhancing Air Quality & Comfort

Introducing Add-on G4 Devices

Air Quality and comfort inside buildings are the target behind HVAC technology. accordingly several points must always be considered in order to achieve target.

To enhance comfort:
- air must be not stagnant in the space
- air flow noise level must be minimal
- fresh air volume must be balanced based on dwellers
- Air Quality must be maintained.

The above is also applicable in Parking areas as well as machine rooms, and storage

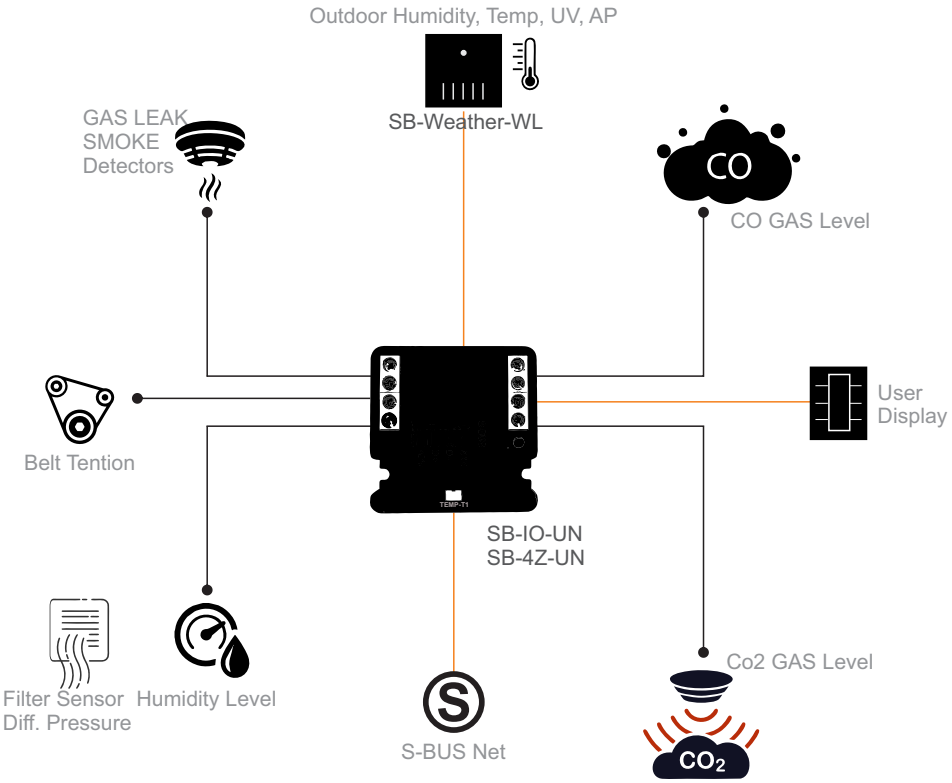
To enhance air quality:
- monitor CO gas level
- monitor Humidity
- Filter and process fresh air incoming
- De-germinise air at Heat recovery
- Exhaust out bad air from parking and trapped spaces

Smart G4 has several products that help to enhance comfort and air quality monitoring one of which is the Mini-IO and the 4Z/24Z

SB-IO-UN

SB-4Z-UN

Mini IO - 4Z



Mini IO can also detect Water and fuel tank levels
4Z can also detect sump pump float level and trip

Logical Actions:

Based on detected levels, system will automatically act logically to circulate Loopers at parking taking out bad air and injecting fresh air. similarly will induce fresh air slowly into building to compensate for the people usage based on air quality and occupancy measures

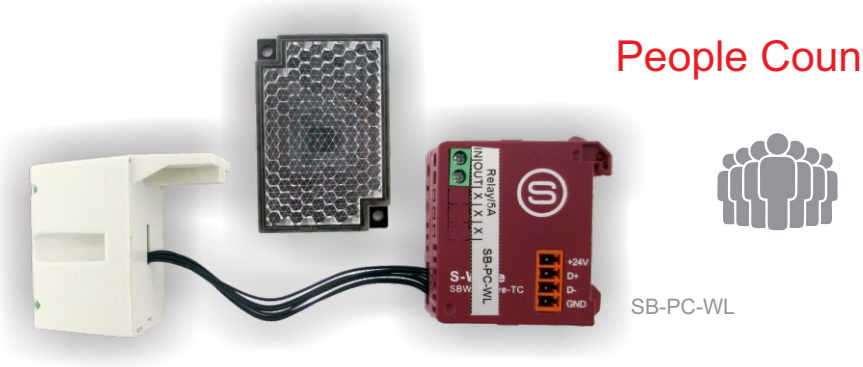
Protective Alerts that saves Energy and Money

-Mini IO-4Z can be used to detect alerts in differential filter pressure, motor belt tension that would cause more energy drain in HVAC system. and would cause operation issues
-The Smart G4 Noise level Detection SS-USS-SL can detect increase in noise which means that bearings maintenance is also required saving money and energy.

Energy Saving With HVAC Optimization

Based on Occupancy, Comfort ECO, infiltration Detection, & Protective maintenance

People Counter



Feature:

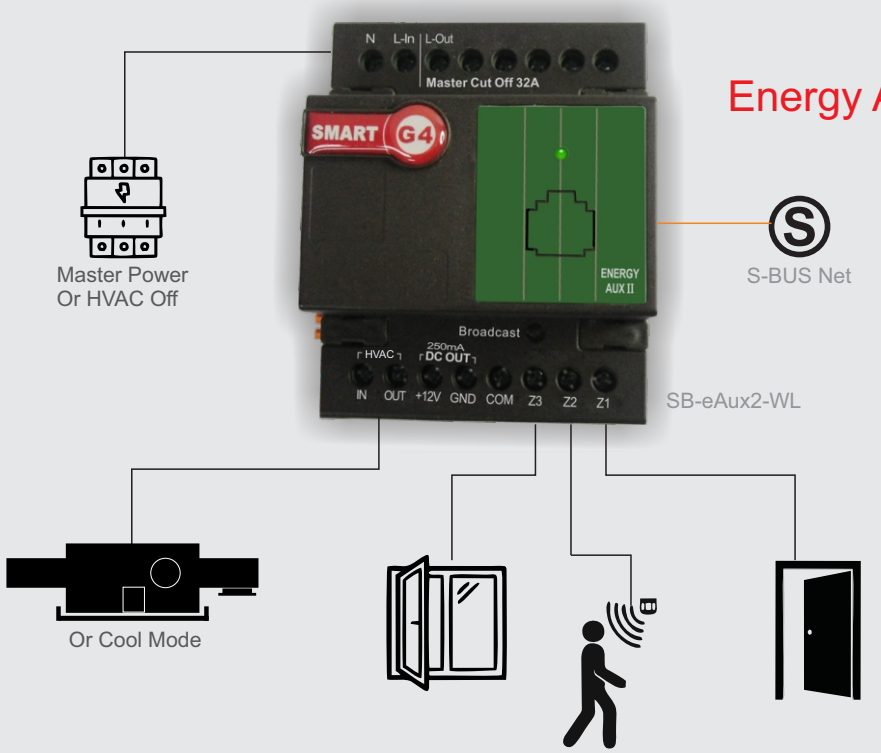
This Module is capable to detect and count people entering or exiting from Room/space (Like Ball Room). It works for single door and double door

Application:

- Inducing Fresh air into ball room based on number of people arrived
- Switch off and decrease HVAC units based on Time and People leaving
- Count people and alert red if number of people in space limit is reached

(Covid 19 Application)

Energy Aux2



Energy Save

- If space not Occupied for time more than XX Switch off master power
- If window opened for X time Turn AC to Fan (*Option)
- if window stays open for XX time Switch off AC
- if Window Stays open for XXX Time Alert to close it (Avoid energy Loss)
- If Door stays open for XX switch off AC Or Turn it to Fan mode

Built in Energy Logic

A Single Controller Module can do that all

Monitoring of Climate inside Storage Facilities

FREEZER STORAGE

Risks
- Temperature drop
- people stay long inside
- people entrapped

COLD STORAGE

Risks
- Temperature Increases or temperature drop
- Doors forgotten open

DRY STORAGE

Risks
- Humidity Increases
- Temperature increase
- water leakage
- fire

Solution:
- Add 4T and Mini-IO & People counter, to Monitor all requirements in Cold Stores, Dry Stores, Freezer Stores. (Temperature, Humidity, Door status, Panic, Fire, Leakage ...)
- Use Relay actuators, Zone-audio and SMS to Send Audible and visual alerts to safe both products and People lives trapped.

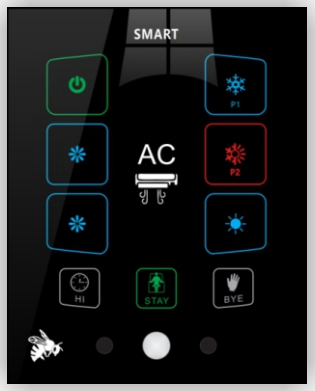
G4 CAN

Contact your nearest Smart G4 Dealer to help you design best storage monitoring and automating system for your Storage facilities.

Climate Control User Interface Examples

SB-CTP-UN/B

SB-CDP2-UN/W



SB-Hornet-FCU9T-UN/B

SB-DTPu-UN/W

Smart G4 APP and SW

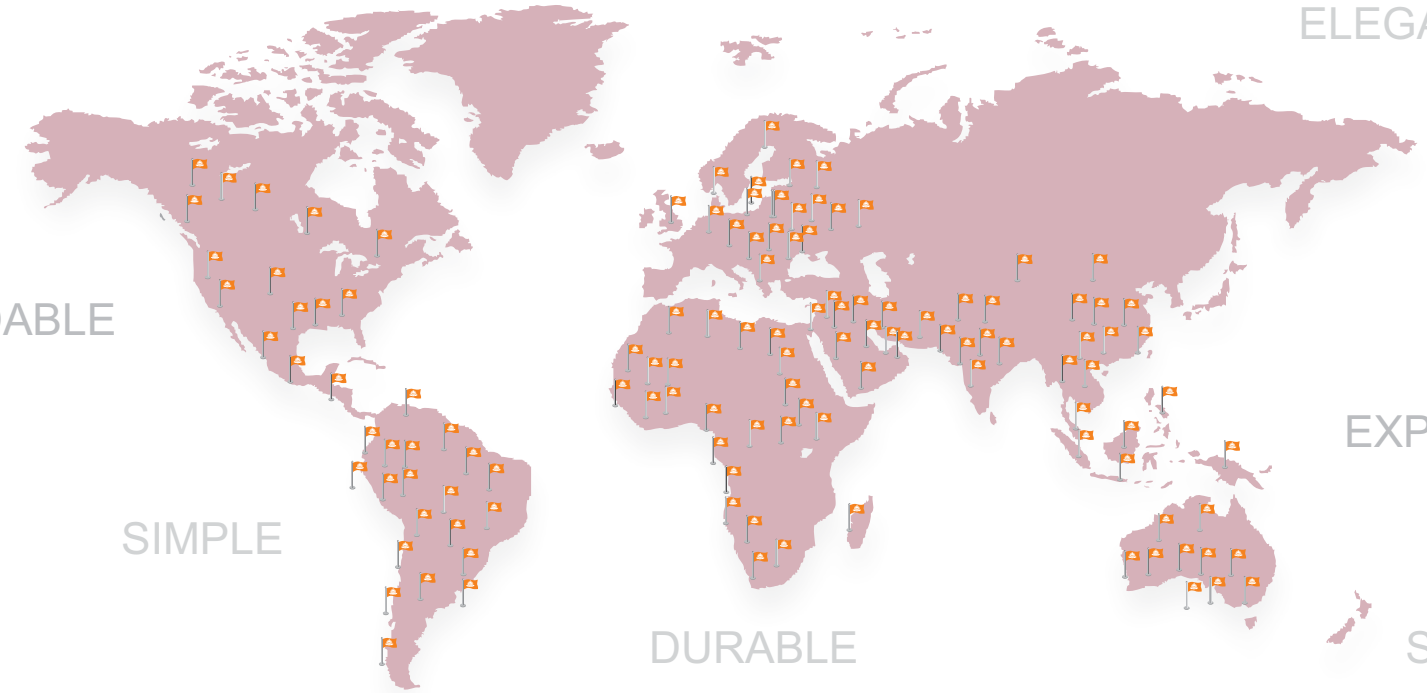
SB-AC4B-EU/W

For more variety and options, Please check smart G4 User interface Catalogues

G4s
Smart-Bus

CUTTING EDGE

ELEGANT



AFFORDABLE

EXPANDABLE

SIMPLE

DURABLE

SMART

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