

SCALA1 Module Integration Guide

Contents

SCALA1 Module Integration Guide	1
Introduction	2
Purpose	2
Use conditions	2
Module Description	2
Module Integration	4
Host product exploded view	4
Module placement in Host product	4
Antenna placement in Host product	5
GND considerations in Host product	5
RF exposure considerations of Host product	5
Other considerations	5
Host manual considerations	6
Regulation information	7
Module identification	7
Module label	7
FCC	7
FCC Rules	7
FCC ID	7
ISED Canada	7
ISED RSSs	7
ISED IC	8
Host product Labelling instructions	8
Contains	8
Disclaimer US English	8
Disclaimer Canadian French	8

Introduction

The module allows wireless control of the SCALA1 host product

Purpose

The module is the user interface (UI) of the host product via Bluetooth Low Energy (BLE). The module communicated with a smartphone with a “Grundfos Go” app installed.

Use conditions

The SCALA1 module may only be used inside a Grundfos host product.

The host product must provide an IP X4 or better enclosure to keep ingress of water away from the module.

Module Description

The module is self-contained with buffered in- and output, regulated voltage, onboard integrated antenna, RF shielding of the radio parts (except antenna).

- Voltage supply is: 115 Vac, 60 Hz
 - Internally regulated Vss: 3 – 8 Vdc, nominal 5 Vdc
- Current draw Vss is: 250 mA max, 60 mA nominal
- Temperature range is: 0 – 55 degrees Celsius
- Communication, wired RS-485 115 kBaud
- Radio air interface BLE – Bluetooth Low Energy
 - Frequency Band: 2.4 GHz ISM
 - Frequency of Operation: 2400 – 2483.5 MHz
 - Antenna Gain: 0 dBi (Integrated F-type antenna)
 - Type of Modulation: GFSK
 - Emission Designation : F1D / G1D
 - Transmit Power (EIRP): 5 ±0.1 dBm
 - Bandwidth: 1 MHz
 - Channel Spacing: 2 MHz
 - Bluetooth Version: 4.2

The module complies to all 8 requirements of the FCC modular approval rules:

• Requirement	• Compliance: Yes or No along with a justification
<ul style="list-style-type: none">• The radio elements must have the radio frequency circuitry shielded. Physical components and tuning capacitor(s) may be located external to the shield, but must be on the module assembly	<ul style="list-style-type: none">• Yes.• Physical shield box covers all RF parts except the F-antenna.• Peripheral interface parts are not shielded
<ul style="list-style-type: none">• The module must have buffered modulation/data inputs to ensure that the device will comply with Part 15 requirements with any type of input signal	<ul style="list-style-type: none">• Yes.• The transceiver has buffered data input / output ports.

<ul style="list-style-type: none"> The module must contain power supply regulation on the module 	<ul style="list-style-type: none"> Yes. Module contains a voltage regulation
<ul style="list-style-type: none"> The module must contain a permanently attached antenna, or contain a unique antenna connector, and be marketed and operated only with specific antenna(s), per Sections 15.203, 15.204(b), 15.204(c), 15.212(a), 2.929(b) 	<ul style="list-style-type: none"> Yes. External to the shield, the Printed Circuit Board has a “F-type” antenna, solderconnected to the matching network
<ul style="list-style-type: none"> The module must demonstrate compliance in a stand-alone configuration 	<ul style="list-style-type: none"> Yes. Module is to be part of a host product. It is listed in standalone configuration, with only power and data (USB) supply leads
<ul style="list-style-type: none"> The module must be labelled with its permanently affixed FCC ID label, or use an electronic display (See KDB Publication 784748 about labelling requirements) 	<ul style="list-style-type: none"> Yes. Label is affixed to RF shield box
<ul style="list-style-type: none"> The module must comply with all specific rules applicable to the transmitter including all the conditions provided in the integration instructions by the grantee 	<ul style="list-style-type: none"> Yes.
<ul style="list-style-type: none"> The module must comply with RF exposure requirements 	<ul style="list-style-type: none"> Yes. Bluetooth module is Bluetooth Low Energy (BTLE) and will not have enough power to exceed SAR limits. It is also to be mounted >20 cm from any bodyparts.

Module Integration

Host product exploded view



Module placement in Host product

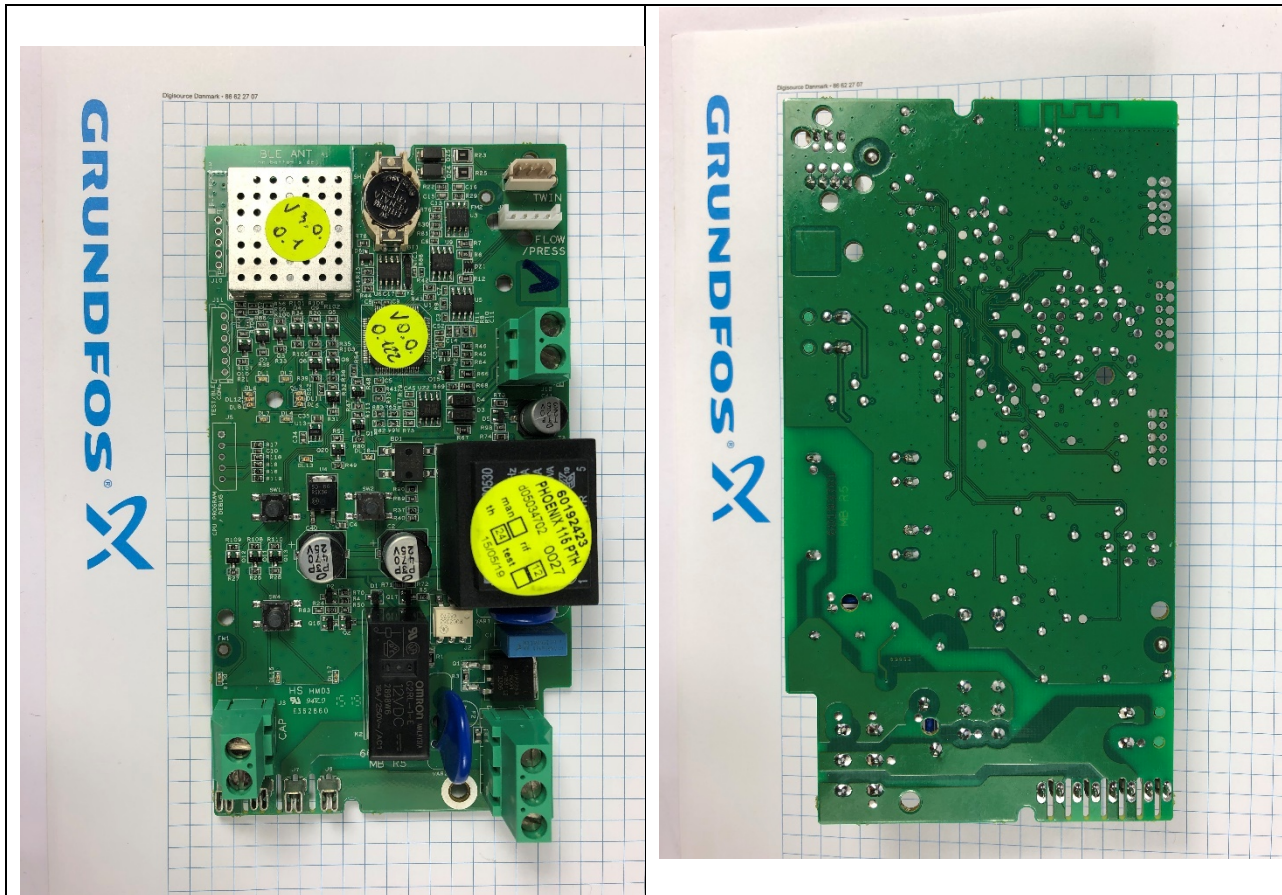
The module must be placed in a location where there are no metal or conductive parts between the radio module and the user.



Antenna placement in Host product

The module has a PCB trace “F” antenna with 0 dBi gain in the max. direction.

The antenna is located outside the RF shield of the module and must be kept free of conductive parts and wires.



The PCB antenna is located under the silkscreen text “BLE ANT” on the PCB component side and is visible on the non-component side of the module PCB

GND considerations in Host product

The module antenna uses the GND plane of the module and is not dependant of the host GND plane construction.

RF exposure considerations of Host product

Because the radiated power (EIRP) is 0 dBm and only the integrated antenna can be used, the host product cannot radiate dangerous amounts of RF energy that can be absorbed by the user. The host is “mobile” and must be more than 20 cm from the users head and body at all times

Other considerations

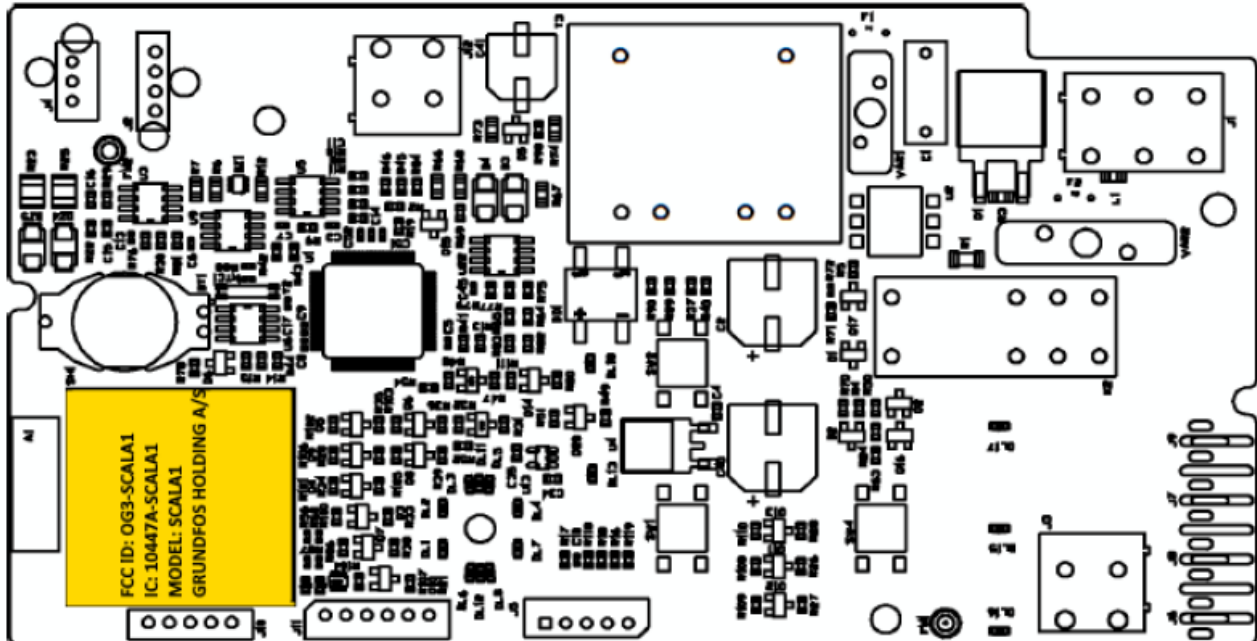
This module may not be co-located with other transmitters or transmit simultaneously with radios within 20 cm.

Host manual considerations

The host manual must contain instructions that the user may not be closer than 20 cm from the RF parts of the module.

Regulation information

The SCALA1 module is marked with “MODEL: SCALA1”, manufacturer name and labelled with FCC ID and ISED IC.



Module identification

The Radio module is a monolithic PCB with the module label affixed

Module label

The module label contains the following information

- FCC ID: OG3-SCALA1
- IC: 10447A-SCALA1
- MODEL: SCALA1
- GRUNDFOS HOLDING A/S

FCC

It is the responsibility of the host product manufacturer to ensure continued compliance against FCC Part 15B.

FCC Rules

FCC rule parts 15.247, 15.209, 15.207

FCC ID

OG3-SCALA1

ISED Canada

ISED RSSs

- RSS-247 Issue 2

- RSS-102 Issue 5
- RSS-Gen Issue 5

ISED IC

10447A-SCALA1

Host product Labelling instructions

The host must contain the following information in a conspicuous location

Contains

Contains FCC ID : OG3-SCALA1

Contains IC: 10447A-SCALA1

Disclaimer US English

The disclaimer may be placed in the manual and must contain the text:

“This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated with a minimum distance of 20 cm (7.87 inches) between the radiator and your body. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

This device complies with Part 15 of the FCC Rules and with Innovation, Science and Economic Development Canada’s licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications made to this equipment not expressly approved by Grundfos may void the FCC & ISED authorization to operate this equipment.”

Disclaimer Canadian French

The disclaimer may be placed in the manual and must contain the text:

“Cet appareil est conforme aux limites FCC et ISED d'exposition aux radiations qui ont été définies pour un environnement non contrôlé. Cet appareil doit être installé et fonctionner à une distance d'au moins 20 cm (7.87 in) du radiateur et de votre corps. Il ne doit ni se situer, ni fonctionner conjointement avec une autre antenne ou un autre émetteur.

Cet appareil est conforme au paragraphe 15 des règlements du FCC et aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Toute modification apportée à cet appareil n'étant pas explicitement approuvée par Grundfos peut annuler l'autorisation du FCC & ISED à faire fonctionner cet appareil.”