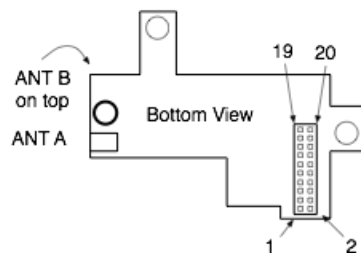


EMIP 400 Implementors Manual

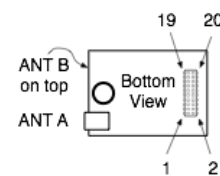
1. Introduction

This document describes the ARRI radio module EMIP400 and its RF wise similar but smaller twin EMIP400s. The transceiver module uses an IEEE 802.15.4 based HW/SW EFR32x platform from Silabs with an additional external Skyworks SKY66112-11 amplifier stage. Frequency range is the ISM 2.4 GHz. Modulation schemes used are OQPSK and 2GFSK.

2. Hardware Interface



EMIP400



EMIP400s

The EMIP400 modules powered by a single 3.3 Volt supply. The physical interfacing to the outside world is done through 2 x 10-pin sockets. The table below describes the pin functions. All signals are 3.3 Volt CMOS compatible and 5 Volt tolerant. All the pins not listed in the table below should be left unconnected.

Pin# 400	Pin# 400s	Signal name	I/O	Function
1	2	+3.3 Volt	PWR	Power supply
2	1	GND	PWR	Ground, power supply return
10	10	DIN	I	Data input (from host)
11	12	RESET	I	Reset the module, active HIGH
12	14	DOUT	O	Data output (to host)
16	16	CTS	I/O	Sampled at Reset, HI normal operation, LOW bootloader
19	20	nRESET	I/O	Reset signal, open drain inverted
20	19	GND	PWR	Ground

3. Channel List

Center Frequency of Each Channel for OQPSK:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
11	2405 MHz	12	2410 MHz	13	2415 MHz	14	2420 MHz
15	2425 MHz	16	2430 MHz	17	2435 MHz	18	2440 MHz
19	2445 MHz	20	2450 MHz	21	2455 MHz	22	2460 MHz
23	2465 MHz	24	2470 MHz	25	2475 MHz		

Center Frequency of Each Channel for 2GFSK:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
12	2410 MHz	13	2415 MHz	14	2420 MHz	15	2425 MHz
16	2430 MHz	17	2435 MHz	18	2440 MHz	19	2445 MHz
20	2450 MHz	21	2455 MHz	22	2460 MHz	23	2465 MHz
24	2470 MHz	25	2475 MHz				

4. EMIP400 Specifications

Parameter	Value
Operating temperature	-20° ... 65° C
Power supply range	3.15 ... 5.5 Volt
Modulation type	OQPSK, 2GFSK

5. Precaution

PRECAUTION: This Implementor's Manual requires special skills and knowledge of the WRS Units. Please read this instruction carefully and start working only if you feel safe about completing it. If not, please contact ARRI Austria Service:

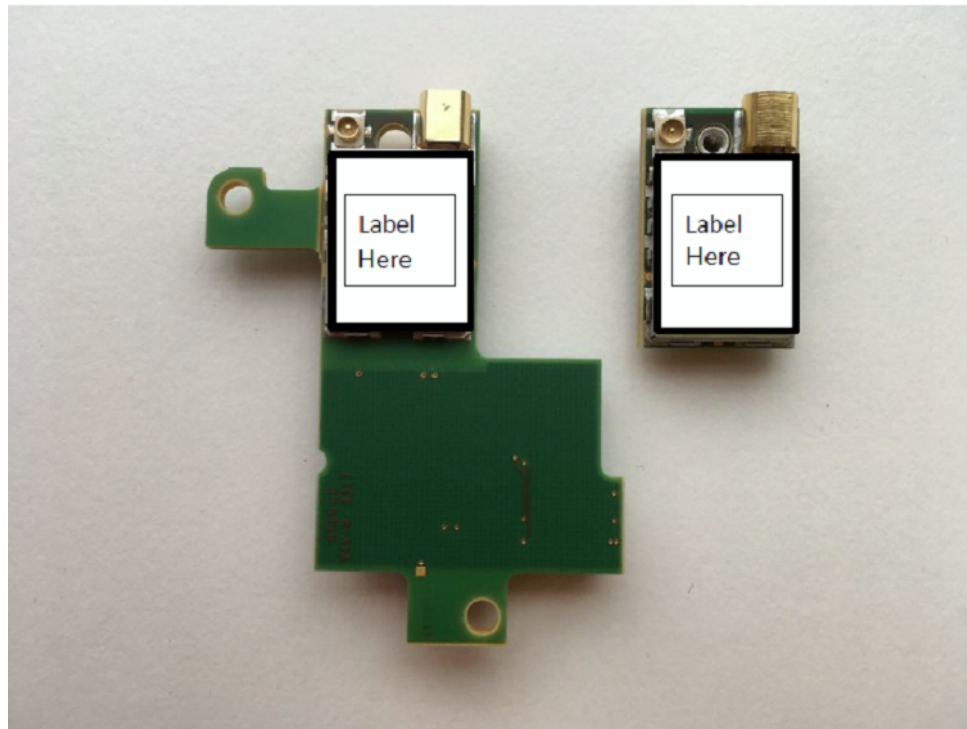
Phone: +43/1/8920107-65

Fax: +43/1/8920107-12

ATTENTION
Static sensitive components



6. Label Position



Label position on radios EMIP400 (left) and EMIP400s (right)



7. Antenna Connectors

The module is equipped with one MMCX connector (ANT A) and one U.FL connector (ANT B).

8. Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	HFB	N/A	Inverted Antenna	2 dBi for 2.4 GHz
2	Proant AB	333	Dipole Antenna	2 dBi for 2.4 GHz
3	NEARSON	S131AM-2450S	Dipole Antenna	2 dBi for 2.4 GHz
4	Radiall/Larsen	R380.500.125	Dipole Antenna	2 dBi for 2.4 GHz
5	Wanshih	SJ1WFI0006A	Dipole Antenna	2 dBi for 2.4 GHz

Similar antennas with smaller or equal gain can also be used.

9. FCC and IC Statements

The end device must be labeled with:

Contains FCC ID: Y7N-EMIP400

Contains IC: 9482A-EMIP400

FCC §15.19:

This device complies with part 15 of the FCC Rules. 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.

FCC §15.21:

Changes or modifications made to this equipment not expressly approved by the party responsible for compliance may void the FCC authorization to operate this equipment.

FCC §15.105 (b):

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- o Reorient or relocate the receiving antenna.
- o Increase the separation between the equipment and receiver.
- o Connect the equipment into an outlet on a circuit different from that to which the Receiver is connected.
- o Consult the dealer or an experienced radio/TV technician for help.

Canada, Industry Canada (IC) Notices:

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Canada, avis d'Industry Canada (IC):

Le présent appareil est conforme 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.

This radio transmitter FCC ID: Y7N-EMIP400 & IC: 9482A-EMIP400 has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Cet émetteur radio FCC ID: Y7N-EMIP400 & IC: 9482A-EMIP400 a été approuvé par Industrie Canada pour fonctionner avec les types d'antennes énumérés ci-dessous avec le gain maximal admissible et l'impédance d'antenne requise pour chaque type d'antenne indiqué. Types d'antennes n'est pas inclus dans cette liste, ayant un gain supérieur au gain maximal indiqué pour ce type, sont strictement interdits pour une utilisation avec cet appareil.

Information for the OEMs and Integrators:

The following statement must be included with all versions of this document supplied to an OEM or integrator, but should not be distributed to the end user.

- 1) This device is intended for OEM integrators only.
- 2) Please see the full Grant of Equipment document for other restrictions.

RF Exposure statement:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20cm may be maintained between the antenna and users.

RF Exposure statement(French)

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition à des appareils mobiles (antennes sont supérieures à 20 cm à partir du corps d'une personne).

Information for the OEMs and Integrators

The following statement must be included with all versions of this document supplied to an OEM or integrator, but should not be distributed to the end user.

- 1) This device is intended for OEM integrators only.
- 2) Please see the full Grant of Equipment document for other restrictions.

Informations pour les OEM et les intégrateurs

L'énoncé suivant doit être inclus avec toutes les versions de ce document fournies à un OEM ou intégrateur, mais ne doit pas être distribué à l'utilisateur final.

- 1) Cet appareil est destiné uniquement aux intégrateurs OEM.
- 2) Veuillez consulter le document de subvention d'équipement pour les autres restrictions.

10. NCC Warning Statement

低功率電波輻射性電機管理辦法

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
(即低功率電波輻射性電機管理辦法第十二條)

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。
(即低功率電波輻射性電機管理辦法第十四條)

For any technical questions please call
ARRI Austria +43 1 892 01 07-65
or send an e-mail to service@arri.at