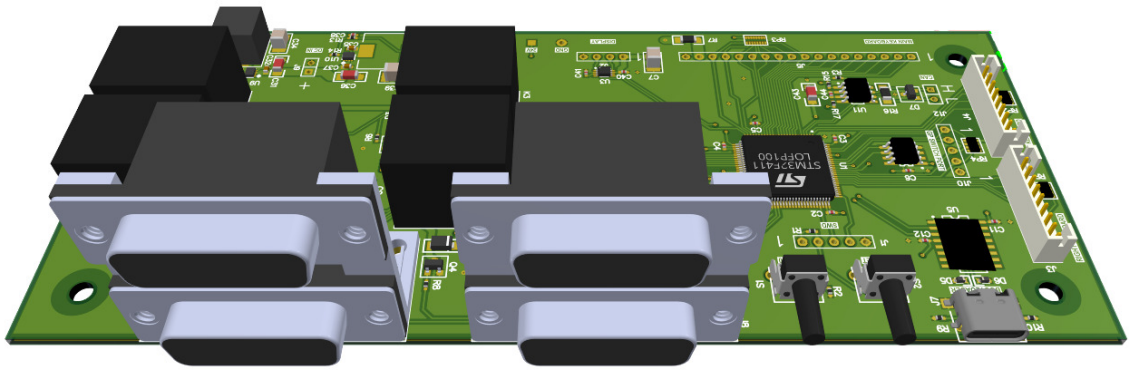
CONTROL AND DISPLAY UNIT HARDWARE SPECIFICATIONS



GPD
06/2024

V1.0

VERSIONS

V1.0

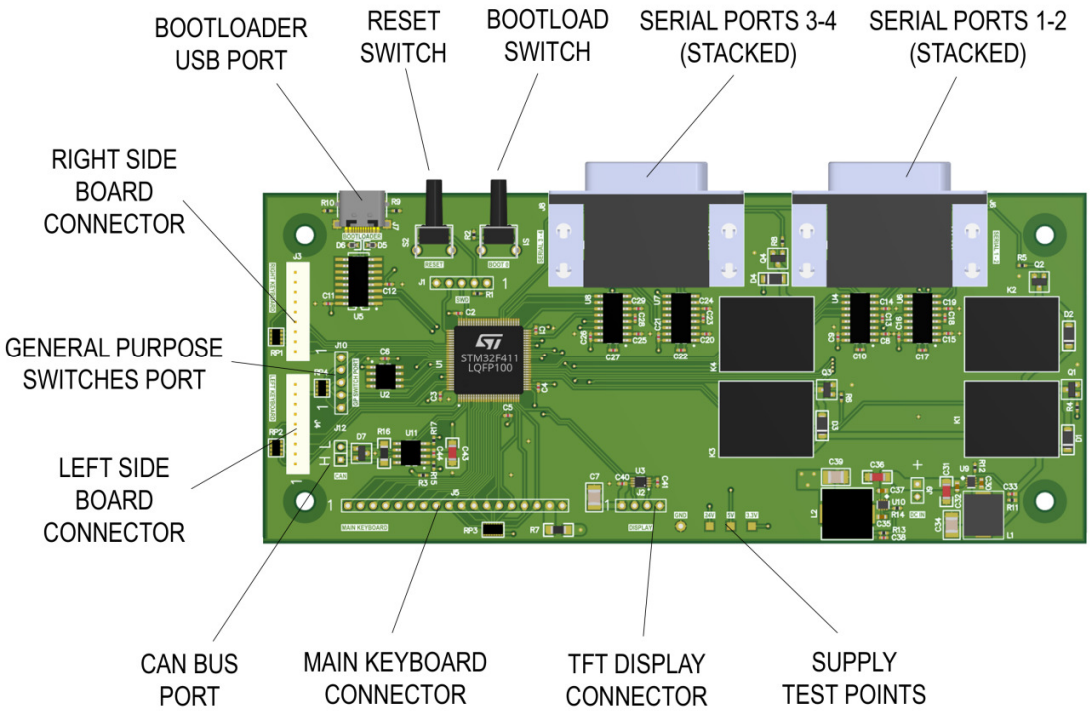
- First version

INDEX

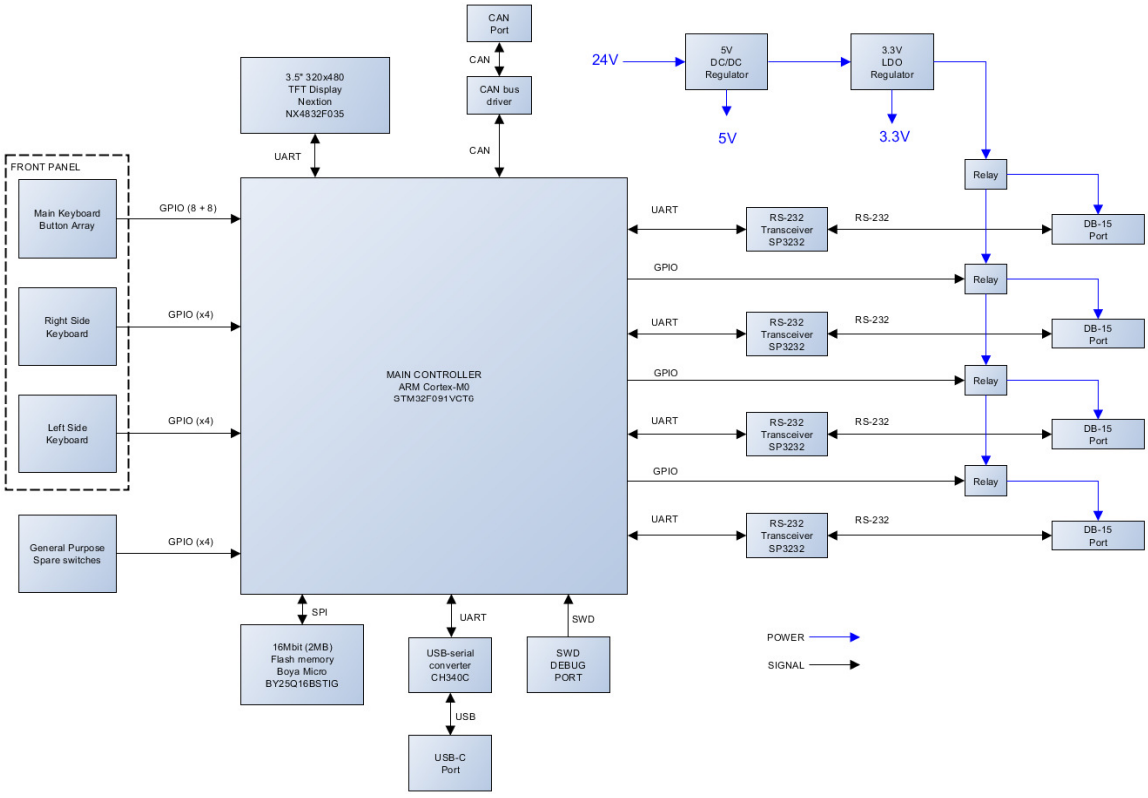
1. SUMMARY

- Main board description.
- Block diagram description
- Pin Out description
- Electrical Specifications

2. DESIGN OVERVIEW



3. BLOCK DIAGRAM



3.1. Main controller

- STMicroelectronics STM32F091VCT6
- ARM Cortex M0 processor
- 256KB of Flash
- 64 Kbytes of SRAM

3.2. LCD Display

- Serial port for 3.5" 320x480 TFT Display
- Nextion NX4832F035

3.3. Serial port transceivers

- RS-232 and NMEA 0183 compliant ports
- DTR/DSR support (re-mappable for cross-over connections to RCU)

3.4. Sub-D Ports

- 4 x Sub D-F, 15 pin x 2 rows, PCB to wire connectors
- Same pinout than COM 2KR transceiver port
- 24VDC pin included. Switch controlled by software

3.5. Relays

- 10A, 250VAC max, for powering peripherals, either RCU or radio transceivers

3.6. SWD Debug Port

- Optional debug port for developers
- Designed for ST-Link v2.x debug tool from STMicroelectronics

3.7. Main Keyboard Port

- 16 GPIO pins set as 8 rows x 8 columns for reading a max of 64 buttons

3.8. Right/Left keyboard ports

- GPIO inputs for 4 switches, each side
- On-board pull-up resistor for normally off/momentary closed switches.

3.9. Flash Memory

- 16Mbit (2Mbytes) NOR Flash IC Boya Micro BY25Q16BSTIG

3.10. USB port

- Programming port
- Can be used as a general purpose serial port.

3.11. GP Keyboard Connector

- 4 extra inputs for switches
- Same characteristics than the Right/Left keyboard ports

3.12. CAN bus port

- Based on Texas Instruments TCAN334 controller IC
- Shutdown and stand-by controlled by the MCU
- ESD protections
- On-board bus termination resistance (120ohm)

4. PIN OUT DESCRIPTION

4.1. SubD 15 ports

Pin	Name	I/O/P*	Description
1	SERIAL_TX	O	RS232 transmit pin
2	--	--	N/A
3	--	--	N/A
4	--	--	N/A
5	--	--	N/A
6	--	--	N/A
7	GND	P	Power/signal ground
8	VS	P	Relay-controlled 24V output
9	SERIAL_RX	I	RS232 receive pin
10	--	--	N/A
11	--	--	N/A
12	--	--	N/A
13	--	--	N/A
14	DTR	O	RS232 Data Terminal Ready output
15	DSR	I	RS232 Data Set Ready input

* I: input, O: Output, P: Power

4.2. Main Keyboard Port

Pin	Name	I/O/P	Description
1	ROW1	O	Button array scan row 1
2	ROW2	O	Button array scan row 2
3	ROW3	O	Button array scan row 3
4	ROW4	O	Button array scan row 4
5	ROW5	O	Button array scan row 5
6	ROW6	O	Button array scan row 6
7	ROW7	O	Button array scan row 7
8	ROW8	O	Button array scan row 8
9	COL1	I	Button array scan column 1
10	COL2	I	Button array scan column 2
11	COL3	I	Button array scan column 3
12	COL4	I	Button array scan column 4
13	COL5	I	Button array scan column 5
14	COL6	I	Button array scan column 6
15	COL7	I	Button array scan column 7
16	COL8	I	Button array scan column 8
17	BACKLIGHT	O	Backlight control
18	GND	P	Ground

4.3. General Purpose Switch Port

Pin	Name	I/O/P	Description
1	GPSW1	I	Switch 1 input
2	GPSW2	I	Switch 2 input
3	GPSW3	I	Switch 3 input
4	GPSW4	I	Switch 4 input
5	GND	P	Ground

4.4. Right/Left Keyboard ports

Pin	Name	I/O/P	Description
1	SWITCH 1	I	Switch 1 input
2	SWITCH 2	I	Switch 2 input
3	SWITCH 3	I	Switch 3 input
4	SWITCH 4	I	Switch 4 input
5	VDD	P	Backlight supply (3.3VDC)
6	VDD	P	Backlight supply (3.3VDC)
7	VDD	P	Backlight supply (3.3VDC)
8	VDD	P	Backlight supply (3.3VDC)
9	GND	P	Ground

4.5. CAN Bus Port

Pin	Name	I/O/P	Description
1	CAN-H	I/O	CAN bus positive terminal
2	CAN-L	I/O	CAN bus negative terminal

4.6. DC IN Port

Pin	Name	I/O/P	Description
1	DC IN	P	Supply input, 6V to 28VDC
2	GND	P	Ground

5. ELECTRICAL SPECIFICATIONS

5.1. Power supply

Parameter	Min	Nom	Max	Unit	Comments
Voltage	6	-	28	V	
Current	-	-	0.8	A	
Protections	Overload, 11ermal shutdown				

5.2. Sub D 15 ports

Parameter	Min	Nom	Max	Unit	Comments
Voltage	6	9	28	V	VS supply output
Current	-	-	0.9	A	VS supply output
Bitrate	-	9.6	250	kbps	
Driver input voltage	-0.3	-	6	V	TX, DTR
Receiver input voltage	-25	-	25	V	RX, DSR
Driver output voltage	-13.2	-	13.2	V	TX, DTR
Receiver output voltage	-0.3	-	3.6	V	RX, DSR
Shortcircuit current	-	-	50	mA	TX, RX, DTR, DSR
ESD protection	-	-	8	KV	Any polarity

5.3. Display port

Parameter	Min	Nom	Max	Unit	Comments
Voltage	4.65	5.0	6.5	V	
Current	-	-	220	mA	Brightness at 100%
Serial max voltage	3.0	-	5.0	V	
Baudrate	2400	9600	921600	bps	
Flash Memory	-	-	120	MB	For fonts and images
EEPROM Memory			1	KB	User data for UI
Power consumption	0.5	–	1.5	W	

5.4. Main Keyboard Port

Parameter	Min	Nom	Max	Unit	Comments
Voltage	0	-	3.3	V	
Current	0	-	3	mA	All switches closed, Backlight off
Total current	-	-	470	mA	All switches closed, Back light on

5.5. CAN Port

Parameter	Min	Nom	Max	Unit	Comments
Voltage	1.65	2.2	3	V	
Current	0	55	180	mA	Dominant with bus fault
Short circuit current	–	–	200	mA	Dominant
Differential input resistance	30	–	80	kΩ	
Differential input capacitance	–	–	10	pF	

5.6. Right, Left and GP Keyboard Ports

Parameter	Min	Nom	Max	Unit	Comments
Voltage	0	-	3.3	V	
Current - switches	0	-	330	uA	GP switches

NOTES