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A. GENERAL INFORMATION

The **Powered FREE+ 15** is a member of the modular **FREE/FREE+/BeFREE** (also referred to as **FREE**) product family, integrating a 15.0” touchmonitor and a Tipro controller. It can be combined with other family members into multifunctional consoles for various applications.



Rather than vertically standing, the module is a horizontally laying device to provide for an unobstructed view of the operator. However, thanks to internal provision for VESA 100 mounting, it can be affixed to different support mechanisms with variable inclination.



The concept of programmability and modularity is implemented around two major building blocks:

1. All-Interface Board (TM-MMT) – combining Tipro Omni-Interface Controller (USB, PS/2 and RS232), dual-interface (USB and RS232) touchscreen controller and dual-interface (USB and analogue) audio option. Alternatively, this board can be assembled without respective audio components in order to have a lower cost variant where integrated audio is not needed
2. Power Board – combining support for “Tipro power bus” which provides internal +5V (e.g. for Chameleon) and +12V (e.g. for SpeakerBox) power source for all existing and future Tipro modules that require higher current ratings than the ones provided by the primary controller interface (i.e. USB or PS/2)

This approach results in two possible variants of the Powered FREE+15 module. First one comprises all the possible features while the other one lacks only the internal audio option (two built-in loudspeakers and associated electronic circuitry).



Figure A.1 Powered FREE+ 15 Connectivity (variant with audio option)



Figure A.2 Powered FREE+ 15 Connectivity (variant without audio option)

A.1. Highlights

APPLICATIONS

- ◆ dispatcher terminals
- ◆ banking & trading consoles
- ◆ multifunctional control panels
- ◆ digital telephony (e.g. Voice over IP) devices

CONCEPT AND MODULARITY

- ◆ touchmonitor with built-in Tipro controller and multiple interface options
- ◆ integrated USB hub
- ◆ internal audio option (2x 1 W loudspeakers with a special microphone amplifier for an external electret microphone – e.g. TM-AGx module)
- ◆ combinable with other **FREE** add-on modules (e.g. Chameleon, Speakerbox, Handset, keypads ...) into multifunctional terminals
- ◆ acts as a “power hub” for all interconnected modules, so a single 12V power supply is sufficient for all possible configurations

PROGRAMMABILITY

- ◆ built-in Tipro controller enables modularity and programmability via USB, PS/2 or RS232 primary interface
- ◆ integrated buzzer for key-click and warning tones
- ◆ 7 LEDs (4 for layer indication, Caps, Num and Scroll lock indication)
- ◆ 4 programmable layers

VERSATILITY

- ◆ three selectable Tipro controller interface options
- ◆ two selectable touchscreen controller interface options
- ◆ two selectable audio interface options
- ◆ two external Tipro bus connections
- ◆ additional USB downstream port(s) via internal USB hub (functional only if the USB upstream is connected to the computer)
- ◆ pass-through port for secondary PS/2 keyboard (functional only if the PS/2 is selected as primary Tipro controller interface)
- ◆ internal or external electret microphone connection
- ◆ power output (12V/1A) for external modules/devices

A.2. Technical Characteristics

ELECTRICAL

- ◆ **power supply:** 12V ± 5% (from the external AC/DC adapter)
- ◆ **current consumption:** up to 3.0 A (1.5 A_{TYP}), depending on the actual configuration
- ◆ **internal interface and power connectors** (to provide for modularity):
 - **left-hand side Tipro Bus connector:** 6-pin Micro-MaTch header (male) at the end of a 6-wire ribbon cable
 - **right-hand side Tipro Bus connector:** 6-pin Micro-MaTch header (male) at the end of a 6-wire ribbon cable
 - **right-hand side Tipro Power Bus connector:** 10-pin Micro-MaTch header (male) at the end of a 10-wire ribbon cable
- ◆ **external interface and power connectors:**
 - **standard computer interfaces:** VGA, USB, COM, PS/2 ... (see Chapter B.1 for details)

MECHANICAL

- ◆ **casing:** plastic ABS, black (C15) colour with matte black (C25) top part
- ◆ **net dimensions:** 389 x 312 x 109 (W/D/H) [mm]
- ◆ **weight:** 4850 g (approximately)
- ◆ **protection (sealing) grade:** IP 20 (according to EN 60529)

ENVIRONMENTAL

- ◆ **operating ambient temperature range:** 0°C to +40°C
- ◆ **storage ambient temperature range:** -10° C to +50°C
- ◆ **relative humidity range:** 20% to 80% (non-condensing)

DISPLAY

- ◆ **type:** TFT LCD
- ◆ **size:** 15.0" diagonal
- ◆ **aspect ratio:** 4:3
- ◆ **native resolution:** 1024x768 (XGA)
- ◆ **luminance/brightness** (typical): ≥ 400 cd/m²
- ◆ **contrast ratio** (typical): ≥ 500 : 1
- ◆ **backlight lifetime** (typical): ≥ 50,000 hours

TOUCHSCREEN

- ◆ **technology:** 5-wire resistive (ELO)
- ◆ **positional accuracy:** 2.03mm (standard deviation of error)
- ◆ **positional accuracy:** ± 4.572 mm (maximum error)
- ◆ **touch activation force:** <113 g (typically)
- ◆ **controller resolution:** 4096x4096 touch points
- ◆ **light transmission:** $80\pm 5\%$ (at 550 nm wavelength)
- ◆ **lifetime:** 35×10^6 touches in one location

INTEGRATED AUDIO OPTION

- ◆ **loudspeakers:** dynamic, stereo 2x2 W nominal electric power
- ◆ **loudspeaker amplifiers:** stereo, 2x1 W maximal electric output power
- ◆ **microphone amplifier:** logarithmic, with noise gating and compression features
- ◆ **interface:** USB (via internal hub) or analogue

ACCESSORY

- ◆ **power supply** (AC/DC adapter): TM-VPG (12V/60W)
- ◆ **power cord** (with IEC60320/C13 connector): TM-C2E
- ◆ **VGA cable:** TM-CVV
- ◆ **USB cable:** TM-CU1
- ◆ **Legacy interface cables:**
 - RS232 touchscreen cable: TM-CGH (needed only if RS232 touchscreen interface is used)
 - PS/2+RS232 controller cable: TM-CSA (needed only if PS/2+RS232 controller interface is used)
 - Analogue audio cable: TM-CLR (needed only if analogue audio interface is used)

B. OPERATION

B.1. Configuring Powered FREE+ 15

As the USB interface is most frequently used, all selectable interfaces are factory-preset (by three external jumpers: JPT, JPC and JPA – see table Table B.1 and Figure B.1) to USB and operate plug & play. If a customer wants to use some other interface for Touchscreen, Controller or Audio, the corresponding upgrade is quite straight forward.

No	Touch Interface	Controller Interface	Audio Interface	Jumpers			Cables				
				JPT	JPC	JPA	CU1	CGH	CSA	CLR	CVV
1.	USB	USB	USB				Y				Y
2.	USB	USB	ANALOG			OFF	Y			Y	Y
3.	USB	PS2/RS232	USB		OFF		Y		Y		Y
4.	USB	PS2/RS232	ANALOG		OFF	OFF	Y		Y	Y	Y
5.	RS232	USB	USB	OFF			Y	Y			Y
6.	RS232	USB	ANALOG	OFF		OFF	Y	Y		Y	Y
7.	RS232	PS2/RS232	USB	OFF	OFF		Y	Y	Y		Y
8.	RS232	PS2/RS232	ANALOG					Y	Y	Y	Y

Table B.1 Interface Selection – Cables and Jumpers

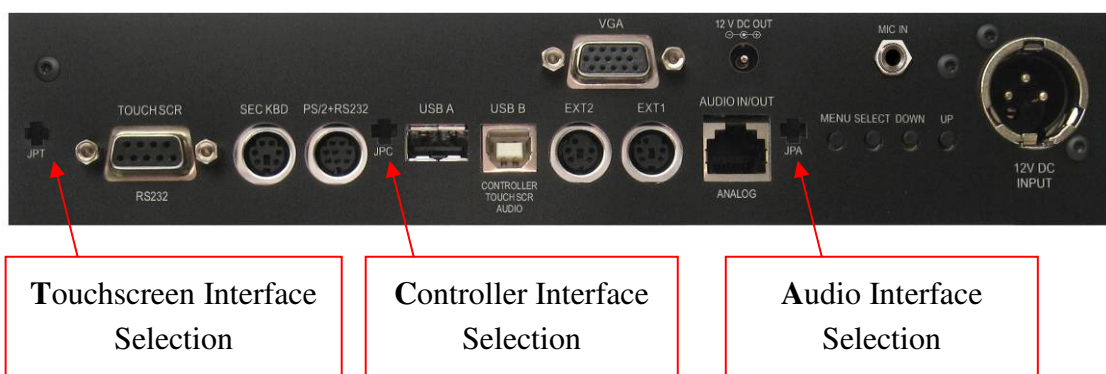


Figure B.1 Interface Selection – Jumpers

For instance, to keep all at USB except the touchscreen (to make it operate via RS232) would just require removal of the corresponding jumper JPT (**JumPer** for **TouChscreen**) and connecting the corresponding cable (TM-CGH). To change the controller interface

from USB to PS/2+RS232 would take removal of the jumper JPC (**JumPer** for **C**ontroller) and connecting the TM-CSA cable. To change the audio interface from USB to Analogue would take removal of the jumper JPA (**JumPer** for **A**udio) and connecting the TM-CLR cable. All three jumper settings are mutually independent.

C. ORDERING CODES

C.1. Module

1
2
3
4
5
6
7
8
T M - X V D - J P 3 - C15 C25 - xxx

1 – Module Type

X – 15.0” touchmonitor (XGA resolution)

2 – Video Interface

V : Analogue RGB (VGA)

3 – Touchscreen Interface & Technology

D : Dual USB & RS232 (5-wire resistive)

4 – TFT LCD Model

H : Innolux G150XGE-L04 (400 cd/m²)

5 – Special Features

P : Tipro Power Bus (Power Board)

6 – Audio Option

0 : none

3 : stereo loudspeakers (USB & Analogue interface)

7 – Housing Colour

C15C25 – black (C15) with black matte (C25) top part (default)

C15C5 – black (C15) with light grey (C5) top part (optional)

8 – Custom version

Three-digit number reserved for product customizations. It is omitted in case of standard version

C.2. Stand-Alone Version (Configuration)

	1	2	3	4	5		6		7	8			
	T	M	C	-	X	M	C	V	-	C15 C25	-	5	00

1 – C – Configuration (Console) – Complete Touchmonitor

2 – X – 15.0” Touchmonitor Module

3 – M – Integrated Controller (Master) Module

4 – C – Interface Cables Included

5 – V – Side Covers (End Caps) and AC/DC Adapter (Power Supply) Included

6 – Housing Colour

C15C25 – black (C15) with black matte (C25) top part (default)

C15C5 – black (C15) with light grey (C5) top part (optional)

7 – Audio Option

4 – without

5 – integrated in

8 – Custom version

Two-digit number reserved for product customizations. **00** represents the standard version.

D. REFERENCES

1. “BeFREE 10” – Technical Overview
2. “BeFREE 15” – Technical Overview
3. “SPEAKERBOX” – Technical Overview
4. “HANDSET” – Technical Overview
5. “ChangeMe” – User’s Manual

E. NOTICES

E.1. Disclaimer

Information furnished by Tipro is believed to be accurate and reliable. However, Tipro makes no representations or warranties regarding the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice.

E.2. Copyright Notice

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