Tixi.Gate H600

- **cloud Gateway**
- **Remote control and maintenance**
- **Alarming**
- **Data logging**
- **Webserver**
- **PLC protocols**

Energy monitoring via M-Bus
A single **Tixi.Gate** device can monitor up to 100 M-Bus meters.

Tixi.Gate models:
HE600, HG600 (GSM/GPRS), **HU600** (UMTS/HSPA)
HT600 (LTE), **HM600** (56k-Modem)

NEW: S-Plugin-modules for H3-XS00 expansion module and the Wand.Box series
Input modules for: Pt-1000, S0, and much more.
See Page 3

Hardware

CPU-System		
CPU	400 MHz, ARM9, ATMEL SAM9-G25	
RAM	128 MB DDR2-RAM	Optional: 256 MB, 32 MB, 64 MB
FLASH Memory	128 MB on-board µSD card reader (internal as HDD) SD card reader (external for user)	Optional: 256 MB – 8 GB Optional: max. 32 GB Optional: max. 32 GB
Operating system (OS)	Linux 2.6.39	
System clock	RTC, battery-backed; synchronization with time server via Internet/Intranet optional RTC internal (standard): 5 ± 23 ppm = 0,43 ± 1,99 s / day = 47 .. 72 s / month RTC external (optional): 20 ppm = ± 1,73 s / day = 52 s / month	
Cryptochip	Software copy protection – optional	
Power-Scheduler optional for battery operation	Programmable Power switch (timer), to shut down the mainboard, if it´s not needed in battery mode and the interfaces on the I/O interface board (A board) are monitored by a separate controller.	

Interfaces of the standard-models											
H600	**H621**	**H627**	**H630/ 32/34**	**H641**	**H647**	**H671**	**H676**	**H623-Mxx**	**H643-Mxx**	**H645-Mxx**	**H625-2S0**
Ethernet	1	1	1	1	1	1	1	1	1	1	1
COM1	RS232	RS232	RS232	RS232	RS232	RS232	RS232	RS232	RS232	RS232	RS232
COM2	RS232	RS232	RS232	RS485/ 422	RS485/ 422	Siemens S7-MPI	Siemens S7-MPI	RS232	RS485	2xRS485	RS232
Digital inputs	-	2	12/8/4	-	2	-	2	2	2	-	2
Analog inputs	-	1	1	-	1	-	1	-	-	-	1
Digital outputs	-	2	0/2/4	-	2	-	2	1	1	-	1
Relays	-	1	-	-	1	-	-	-	-	-	-
Meter interfaces	-	-	-	-	-	-	-	M-Bus 25/60/100	M-Bus 25/60/100	M-Bus 25/60/100	2x S0 pulse input

Device identifier depends on the WAN-interface: H**E**600 (LAN), H**G**600 (GSM), H**U**600 (UMTS), H**T**600 (LTE) , H**M**600 (analog modem)

New series H650										
Interfaces	**H651**	**H652**	**H653-Mxx**	**H653-Mxx-U2**	**H654-Mxx**	**H655-Mxx**	**H656**	**H657**	**H658**	**H659**
Ethernet	1	1	1	1	1	1	1	1	1	1
COM1	RS232	RS485	RS232	RS232	RS485	-	RS232	RS485	RS232	RS485
COM2	RS485	RS485	RS485	RS485	RS485	-	-	-	-	-
Digital inputs	1	-	1	1	1	-	1	1	1	1
USB	1	1	1	2	1	-	1	1	-	-
Meter interfaces (COM3)	-	-	M-Bus 5 / 25 / 100	M-Bus 5 / 25 / 100	M-Bus 5 / 25 / 100	M-Bus 5 / 25 / 100	-	-	-	-

SD-Memory Card	**on C board (HMI board)**
Active LED	green: SD card active red: writing/reading of the SD card
Unmount button	Before removing the SD-card, ALWAYS press the "Unmount" button for 1s and wait until the "Active" LED is off.
Batch mode	Loading up TiXML configuration , copying Log data from the internal memory to the SD card
Memory cards	SD cards up to 32 GB

Controls	
Service button	Freely configurable by the user via TiXML
Signal LED	Controllable via TiXML (red/green blinking function, 32 variants), e.g. red = failure, green= no failure
Speaker	Mini speaker for signal tones, controllable via TiXML, e.g. beeping at alarm
System LEDs	Power, Process/Data out, LAN, Mode

Interfaces	
COM1 RS232	D-Sub 9, female, DCE / H650 series: D-Sub 9, male, DTE max. 230.400 bps, ITU-T V.24, V.28, hardware handshake All signals: DTR, DSR, RTS, CTS, DCD, GND, RI, Rx, Tx Transmission distance: 12 m
COM1 RS485 (H650 series)	3-pole screw, DTE, Under EIA/TIA-485, max 230 kbit/s, non-isolated bus termination integrated, switchable via DIP switch transmission distance max.1200 m depends on transfer rate, bus and cable type
COM2 RS232	D-Sub 9, male, DTE, FIFO 16550, other specifications see COM1 RS232
COM2 RS485	Under EIA/TIA-485, 3- or 5-pole screw max 230 kbit/s, non-isolated bus termination integrated, switchable via DIP switch transmission distance max.1200 m depends on transfer rate, bus and cable type
USB1 Device	communication with PC (Mass Storage Device) – optional on C board micro USB
USB2 Host	Internal for GSM/GPRS/EDGE- and UMTS/HSPA Modem
USB3 Host	Internal for I/O interface board (A board, optional)
Other	UART Full+Lite, I2C, I2S, SPI, JTAG, GPIO, USB+UART (X4 for GSM module)

M-Bus	
Conformity	DIN EN 13757-2, DIN EN 13757-3
Connection	Hy6xx-M5: M-Bus Master for up to 5 terminals (meters) Hy6xx-M25: M-Bus Master for up to 25 terminals (meters) Hy6xx-M60: M-Bus Master for up to 60 terminals Hy6xx-M100: M-Bus Master for up to 100 terminals y: G=GSM/GPRS/EDGE, U=UMTS/HSPA, M=56k modem, E=Ethernet/LAN T=LTE short-circuit proof, isolated M-Bus-voltage: 36 V, bus length: approx. 1 km by M25, Telephone cable ø 2×0,8mm, unshielded, 3 screws, pitch 5,08 mm, cross-section max. 2,5 mm^2
Data rate	300 Baud – 19200 Baud
Data format	8 Data bits, 1 start bit, 1 stop bit and 1 parity bit
Galvanic isolation:	1500 Volt

In- and Outputs (I/Os)

On a single Tixi device up to 8 I/O modules with 128 I/Os can be connected and controlled via the I/O bus.

I/Os in Tixi device		
Inputs	**Digital**	Switchable via potential-free contacts or digital signals (5V max.)
	Analog	0...10 V DC, resolution: 12 Bit Option: 4 … 20 mA
Outputs	**Digital**	Potential free, AC/DC 125 V, 120 mA
	Relay	Potential free, 230 V AC 3 A *or* 110 V DC 0,3 A
Connections		Screws (pitch: 5,08 mm), cross section max. 2,5 mm^2

I/Os in Tixi I/O modules		
Inputs / Outputs	**XP84D**	8 digital inputs, 4 digital outputs
	XP88D	8 digital inputs, 8 digital outputs
	XP84DR	8 digital inputs, 4 Relays
	XS00	Slots for up to two S1 plugin modules (see table below)
OEM I/Os		On customer's request: DI, DO, AI, AO, RS232, RS485, Relays, ...

NEW: S-Plugin modules for H3-XS00 and the Wand.Box models

H3-XS00: Up to two S1 plugin modules can be installed in one H3-XS00 expansion module. Up to 8 H3-XS00 modules can be stacked.

Module type			Accuracy
Inputs	**S1 - D50**	5x digital inputs	-
	S1 - AE3	3x analog inputs 4-20 mA / 0-10 V (switchable by jumper)	0,2% ± 5 mV
	S1 - PT3	3x Pt-1000-inputs	± 1,2 °C
	S1 – S03	3x pulse input S0, max. cable length 30m	-
Outputs	**S1 - D03G**	3x digital Outputs, isolated	-
	S1 - AA2	2x analog Outputs 4-20 mA / 0-10 V (switchable by jumper) Requires separate 24V power supply on H3-XS00 module !	1 % ± 6 mV
	S1 - D05	5x digital Outputs	-
	S1 - WL2	2x relays (changeover); (HS-XS00: 230 V / 3A; Wand.Box: 48 V, 3 A)	-
OEM I/Os		On customer's request: DI, DO, AI, AO, Relays, ...	

Power supply

Standard device	10...30 V DC, typ. 2,5 W (HE series) / 7,5 W (HG series), max. 0,7 A (with up to 8 I/O-Bus-modules) At 24 V DC supply and operation without any expansion modules: max. I = 200 mA
M-Bus Devices	18 ... 30 V DC, max 0,7 A
Connections	2 screws 2,5 mm²

Housing	**Tixi Hut Line H5**
Mounting	On Hut line 35 mm under EN50022, vertically or horizontally
Type	Tixi H5 housing: DIN rail housing (Hut line housing):
OEM-housing	Standard OEM hut line housing: Tixi-H5
Width / height/ depth	88 mm x 57 mm x 91mm
Weight	225 g

Conformity and usage

Conformity	CE Safety: EN60950-1: 2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 EMV: EN55022: 12:2011, EN55024: 09:2011 R&TTE: EN301489-1, EN301489-3, EN301489-7, EN 301511, EN62311
Temperature range	Operation: -25°...+85°C
Humidity	5...95% relative humidity, non-condensing
Protection	IP20
Degree of polution	2
Mechanical strength	Vibration (sinus) according to IEC 60068-2-6, Vibration (broadband) according to IEC 60068-2-64 Shock according to IEC 60068-2-27

OEM models

OEM models are possible in colour and form of the housing
and hardware interfaces or design and software.

OEM customers are provided with complete buildroot envirnment as well as comprehensive documentation ("Hitchhiker's Guide")

Remote communication

Ethernet:	**all standard models**
Connection	10/100 Base-T IEEE 802.3, RJ45 connector (8P8C with 2 LEDs), shielded
Operating mode	Auto negotiation, Auto-MDI-X (Crossover cable not needed)
State LEDs	green blinking Data is transmitted yellow off 10 Base-T yellow on 100 Base-T
Galvanic isolation	1500 V

GSM/GPRS/EDGE:	**HG600 models**
Frequencies	Quad Band 850/900/1800/1900 MHz
EDGE-features	Multi-Slot Class 10, E-GPRS Mobile Station Class B, Coding Schemes MCS 1-9
GPRS- features	Multi-Slot Class 10, GPRS Mobile Station Class B, Coding Schemes CS 1-4, compliant to SMG31bis
GSM- features	Call Forwarding, Call Barring, Multiparty, Call Waiting, Call Hold, Calling Line Identity Advice Of Charge, USSD, Closed User Group
Antenna	FME plug (male), coaxial, impedance 50Ω Receiving frequency: 869...894 MHz, 1930...1990 MHz Transmit frequency: 824...849 MHz, 1850...1910 MHz Power consumption: 2 W in 850/900 MHz mode, 1 W in 1800/1900 MHz mode
Data transmission	GSM: CSD up to 14,4 kbps GPRS: Downlink: 40 kbps, Uplink: 13 kbps EDGE: Downlink: 220 kbps, Uplink: 100 kbps
Fax transmission	Fax Group 3 / Class 1 + 2, 2400...14400 bps, ITU-T (V.17, V.29, V.27ter), Error correction / data compression: MNP2, V.42bis

UMTS/HSPA+:	**HU600: 7,2 / 5,7 Mbps (DL / UL) UMTS modules**
Frequencies	Dual-mode UMTS (WCDMA) / HSDPA / EDGE / GPRS operation Dual Band 900 / 1800 MHz UMTS Band 1 (2100 MHz), Band 8 (900 MHz)
EDGE- features	Multi-Slot Class 12, E-GPRS Mobile Station Class B, Coding Schemes MCS 1-9; up to 236,8 kb/s DL
GPRS- features	Multi-Slot Class 12, GPRS Mobile Station Class B, Coding Schemes CS 1-4; up to 85,6 kb/s DL/UL
UMTS- features	UMTS
GSM- features	Call Forwarding, Call Barring, Multiparty, Call Waiting, Call Hold, Calling Line Identity, Advice of Charge, USSD, Closed User Group
Antenna	FME plug (male), coaxial, impedance 50Ω
Data transmission	GSM: CSD up to 9,6 kbps DL/UL GPRS: Downlink: 85,6 kbps, Uplink: 85,6 kbps EDGE: Downlink: 236,8 kbps, Uplink: 70,4 kbps UMTS: Downlink: 384 kbps, Uplink: 384 kbps HSDPA: category 8: 7,2 Mbps DL (peak rate) HSUPA: category 6: 5,76 Mbps UL

LTE:	**HT600: 150 Mbps / 50 Mbps (DL / UL) LTE modules**
Frequencies	6-Band LTE (800, 850, 900, 1800, 2100, 2600 MHz) Quad Band 3G (850, 900 1800, 1900 MHz) Quad Band 2G (850, 900 1800, 1900 MHz)
EDGE- features	Multi-Slot Class 12, E-GPRS Mobile Station Class B, Coding Schemes MCS 1-9; up to 236,8 kb/s DL
GPRS- features	Multi-Slot Class 12, GPRS Mobile Station Class B, Coding Schemes CS 1-4; up to 85,6 kb/s DL/UL
UMTS- features	DC-HSPA+, UMTS Terrestrial Radio Access (UTRA), HSDPA category 24; up to 42 Mbit/s DL
LTE- features	3GPP Release 9, LTE, E-UTRA, FDD, DL Multi-Input Multi-Output (MIMO) 2 x 2; 150 Mbit/s DL, 50 MBit/s UL
GSM- features	Call Forwarding, Call Barring, Multiparty, Call Waiting, Call Hold, Calling Line Identity Advice Of Charge, USSD, Closed User Group
Antenna	FME plug (male), coaxial, impedance 50Ω
Data transmission	GPRS: Downlink: 85,6 kbps, Uplink: 85,6 kbps EDGE: Downlink: 236,8 kbps, Uplink: 236,8 kbps HSDPA: category 24: 42 Mbps DL (peak rate) HSUPA: category 6: 5,6 Mbps UL LTE: category 4: 150 Mbit/s DL, 50 MBit/s UL

Analog modem 33k/56k HM600 models (in work)	
Speed	2400 … 33k / 56k
Connection	RJ11

WIFI (optional)	USB module "ZW-R1SR10"
WIFI	USB stick model "ZW-R1SR10"
Wireless Typ	IEEE 802.11b/g/n WPS (WiFi Protected Setup)
Frequency	1T1R 2,4 GHz
Wireless Data Rate	IEEE 802.11b: 11 MBit/s brutto max. IEEE 802.11g: 54 MBit/s brutto max., IEEE 802.11n: 150 MBit/s brutto max.
Network Modi	Ad-hoc, Infrastructure
Encoding	WEP-64, WEP-128, TKIP, WPA2
Antenna-connection	Internal
Temperature range	0 .. 40 °C
Wireless range	Approx. 10m

Short Range Radio	planned on C-Board and on S1-Board (in work)	
Frequency	868 MHz (Prototype-stadium)	Option: 168 MHz, 433 MHz
	Wireless M-Bus according to OMS - planned	

System Software

Firmware + operating system	
TECom	**Tixi Embedded Communication System TECom** TECom offers the basic features that are required for augmentative communication with PLCs and the remote communication in telephone networks, mobile networks, LAN, WLAN and IP based networks. TECom is independent from the operating system and portable.
Operating system	Linux 2.6.39
File system	UBIFS Log data and process variables (in RAM) are safely stored in FLASH ROM even if power is lost (TECom).
OEM functions	The firmware is upgradeable for OEM customers, including: New control protocols, computing or processing functions or web server functions.
Libraries for Data Security	Industry standard OpenSSL (TLS 1.2) and OpenVPN

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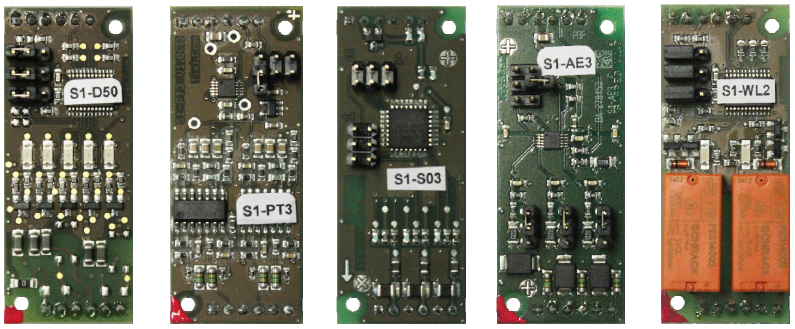
Example Images

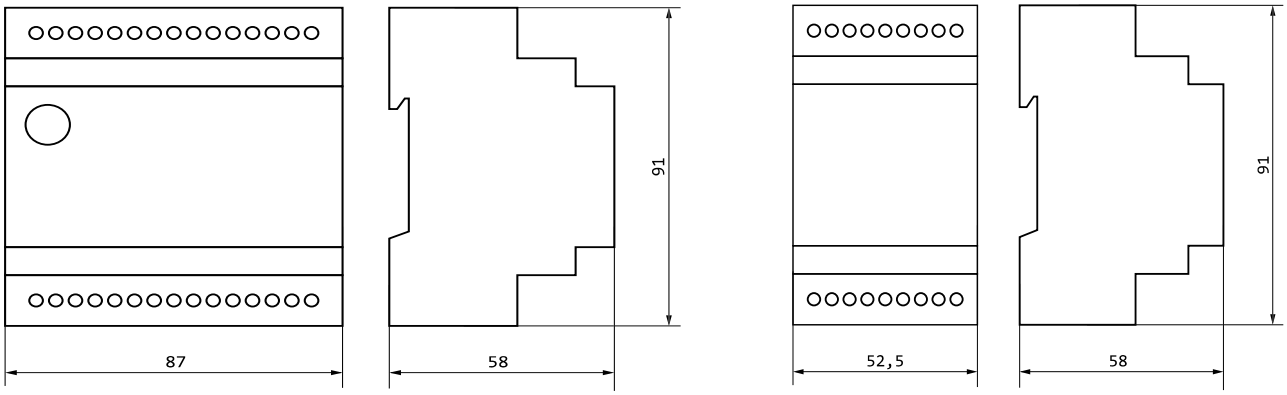
HE627

XP88D

XS00

S1-Expansion modules (examples)





OEM models

For OEM models the following customizations are possible:

- colour of housing
- shape of housing
- hardware I/Os or design
- software

For OEM customers who want to create their own Linux applications on the Tixi platform a comprehensive documentation ("Hitchhiker's Guide") and the complete buildroot environment is available upon request.

Interfaces OEM models (example)	
H600	**e.g. HUE626**
Ethernet	2
COM1	RS232
COM2	RS232
Digital inputs	2
Analog inputs	1
Digital outputs	2
Relay	-
Counter interface	-

UMTS/HSPA+:	**HU[y]6xx-WW: 7,2 / 5,7 Mbps (DL / UL) with UMTS module**
Frequency	Dual-mode UMTS (WCDMA) / HSDPA / EDGE / GPRS operation Quad Band 850 / 900 / 1800 / 1900 MHz UMTS Band I (2100 MHz), II (1900 MHz), IV (1700 MHz), V (850 MHz), VI (800 MHz), VIII (900 MHz)
EDGE features	Multi-Slot Class 12, E-GPRS Mobile Station Class B, Coding Schemes MCS 1-9; up to 236,8 kb/s DL
GPRS features	Multi-Slot Class 12, GPRS Mobile Station Class B, Coding Schemes CS 1-4; up to 85,6 kb/s DL/UL
UMTS features	UMTS Terrestrial Radio Access (UTRA) HSDPA category 8
GSM features	Call Forwarding, Call Barring, Multiparty, Call Waiting, Call Hold, Calling Line Identity Advice Of Charge, USSD, Closed User Group
Antenna	FME plug (male), coaxial, impedance 50Ω
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WW = worldwide modem