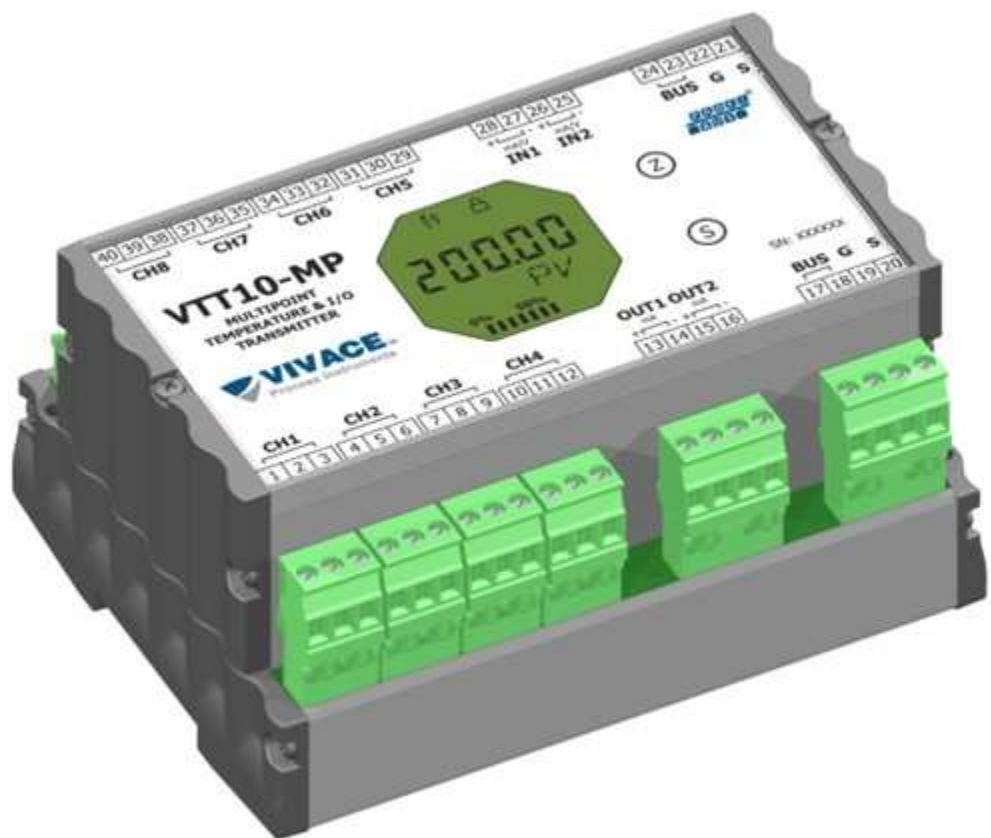


VTT10-MP

PROFIBUS-PA MULTIPOINT TRANSMITTER

Temperature & I/O



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NOTE

We have reviewed this manual with great care to maintain compliance with the hardware and software versions described herein. However, due to the dynamic development and version upgrades, the possibility of technical deviations cannot be ruled out. We cannot accept any responsibility for the full compliance of this material.

Vivace reserves the right to, without notice, make modifications and improvements of any kind in its products without incurring in any circumstances, the obligation to make those same modifications to products sold previously.

The information in this manual is frequently updated. Therefore, when using a new product, please check the latest version of the manual on the Internet through our website www.vivaceinstruments.com, where it can be downloaded.

You customer is very important for us. We will always be grateful for any suggestions for improvements as well as new ideas, which can be sent to the e-mail: contato@vivaceinstruments.com preferably with the title "Suggestions".

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WARNING

It is extremely important that all the safety instructions, installation and operation in this manual are followed faithfully. The manufacturer is not liable for damage or malfunction caused by improper use of this equipment.

It is recommended to strictly following the rules and good practice relating to installation, ensuring correct grounding, noise insulation and good quality cables and connections in order to provide the best performance and durability to the equipment.

Special attention must be considered in relation to installations in hazardous areas, where applicable.

SAFETY PROCEDURES

- *Appoint only skilled people, trained with process and equipment;*
- *Install equipment only in operation compatible areas, with the proper connections and protections;*
- *Use proper safety equipment for any handling device in field;*
- *Turn area power off before equipment installation.*

SYMBOLOLOGY



Caution - indicates risk or error source



Important Information



General or Specific Risk



Electric Shock Danger

GENERAL INFORMATION



Vivace Process Instruments ensures the operation of this equipment, according to the descriptions contained in its manual, as well as technical characteristics, not guaranteeing its full performance in particular applications.



The operator of this equipment is responsible for observing all aspects of safety and prevention of accidents applicable during the execution of the tasks in this manual.



Failures that might occur in the system, causing damage to property or injury to persons, shall additionally be prevented by external means to a safe outlet for the system.



This equipment must be used only for the purposes and methods proposed in this manual.

DATA SAVING

Whenever static data is changed via configuration, LCD will display  icon, which will be blinking until the save process is complete.



If user wishes to shut down the equipment, he must wait for the process to be finished.



If the equipment is shut down during saving process, a default will be performed, setting default values in device parameters and the user must subsequently check and configure those parameters according to his needs.

ERROR ON SAVING DATA

If a data execution or saving operation was incorrectly performed, message "BlkEr" will be displayed when the equipment is powered up.



In this case, user must perform factory initialization using two magnetic tool units as described below. Application-specific settings should be performed again after this procedure (except for the physical address and the "GSD Identifier Number Selector" parameter).

- *With the equipment off, access "Z" and "S" holes of local adjustment, located under the equipment nameplate;*
- *Insert one of the tools inside "Z" hole and the other inside "S" hole;*
- *Energize the equipment and keep both magnetic tool units until icon  is displayed;*
- *Do not turn off power while icon  is displayed. If this happens, restart the procedure.*

SIMATIC PDM CONFIGURATION



When using SIMATIC PDM tool for configuration/parameterization of this equipment, do not use "Download to Device" option. This function could incorrectly configure the equipment.

It is recommended for user to use "Download to PG/PC" option, to read the equipment parameters and then access the "Menu Device" option, where one can find specific menus for transducers, functional and LCD blocks, plus calibration, maintenance, factory etc. According to each menu, user will then be able to change the parameter or function as desired, in a fast and direct form.

1 EQUIPMENT DESCRIPTION

VTT10-MP, Profibus-PA Multipoint Transmitter, is a member of Vivace Process Instruments family of temperature transmitters, designed for DIN rail or 2 "tube installation via a U-bracket and clamp when using a protective enclosure. It works with several types of sensors, such as thermocouples and RTDs, plus resistance and voltage signals.

The transmitter is powered by a 9 to 32 Vdc voltage according to the Profibus standard and is connected to the Profibus-DP network via a DP/PA coupler using a pair of twisted and shielded wires. Profibus-PA technology allows the interconnection of several equipment in a network, allowing the construction of large control systems. VTT10-MP works with the concept of functional blocks such as Analog Input, Analog Output and Transducer.

Through a Profibus-PA configurator or tools based on EDDL or FDT/DTM, it is possible to configure the sensor type, measuring scales, work units and calibration, as well as monitor the measurement variables and check the equipment status. Settings also can be made locally with the use of a magnetic tool.

Prioritizing high performance and robustness, it was designed with the latest electronics and materials technologies, ensuring long-term reliability for systems of any scale.

1.1. BLOCK DIAGRAM

The modularization of VTT10-MP components is described in the block diagram of Figure 1.1.

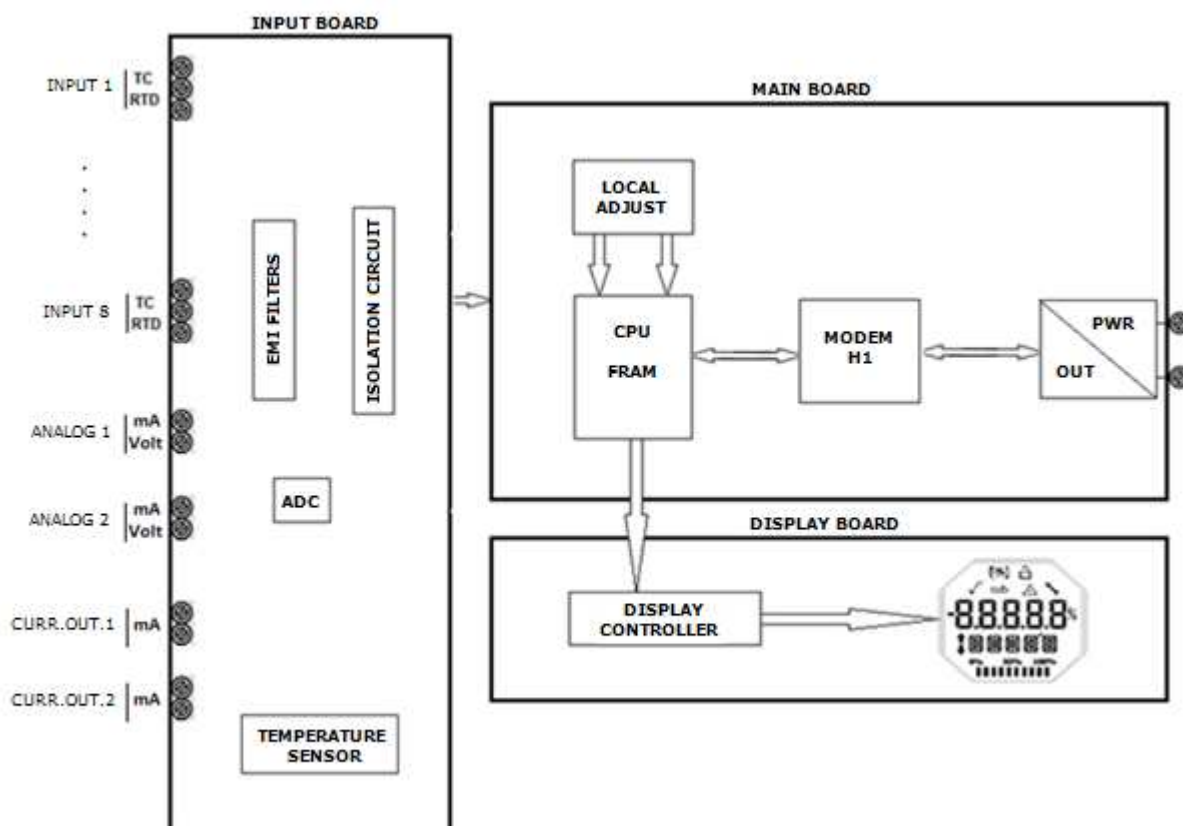


Figure 1.1 – Block diagram for VTT10-MP.

The signals from the sensors pass through the RF filter and follow to the ADC converter, where they are converted into digital values. These values are converted to temperature or current, according to the selected channel. The 4-20 mA outputs are generated according to user settings.

The sensor signals are galvanically isolated from the power supply, but are not insulated from each other.

The Modem H1 block interfaces the microcontroller signals with the Profibus-PA network to which the transmitter is connected.

The display board has the controller module responsible for adapting the messages to be displayed on the LCD.

Finally, the microcontroller block can be related to the transmitter's brain, where all the time controls, communication control, and routines common to transmitters such as configuration, calibration and monitoring take place.

NOTE



The sensor signals are galvanically isolated from the power supply, but are not insulated from each other. Therefore, isolated sensors must be used to prevent noise from one sensor from interfering with the other. There is also no insulation between the temperature channels, the chain channels.

2 INSTALLATION

2.1. MECHANICAL ASSEMBLY

VTT10-MP Multipoint Transmitter is designed for panel mounting with DIN rail, but maintains good performance in temperature, humidity and vibration variations.

The electronic circuit is coated with a moisture-proof lacquer, but constant exposures to moisture or corrosive media can compromise its protection and damage the electronic components.

Figure 2.1 shows the dimensional design and mounting forms of the VTT10-MP.

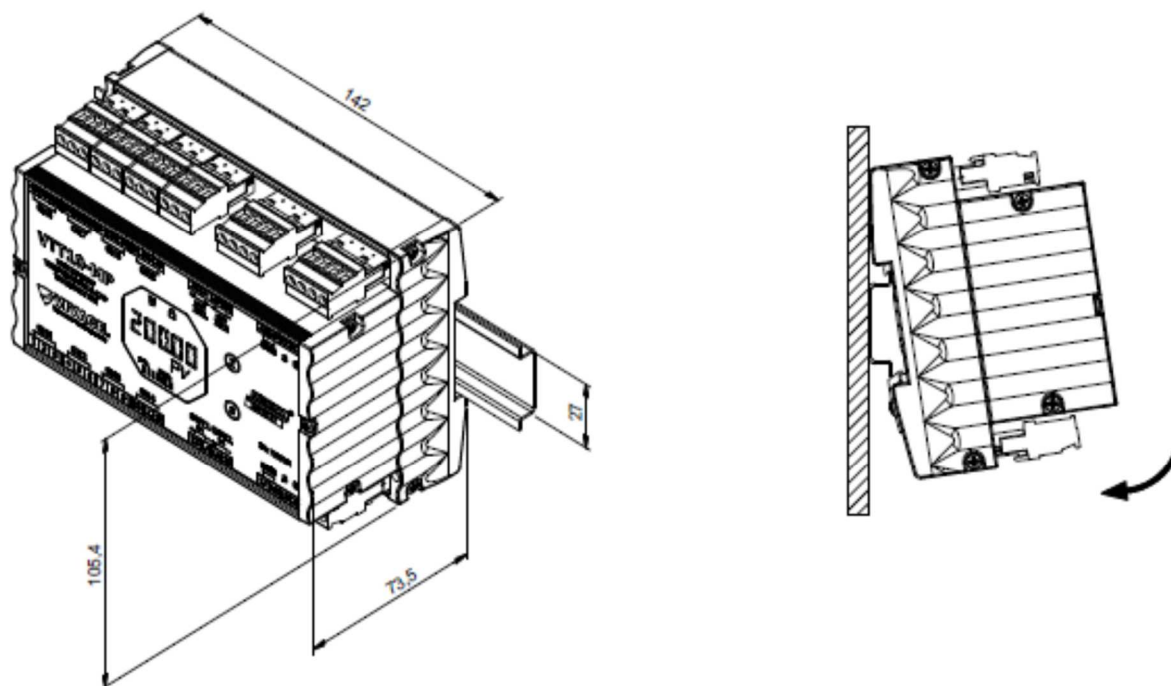


Figure 2.1 – Dimensional drawing and assembly diagram of VTT10-MP.

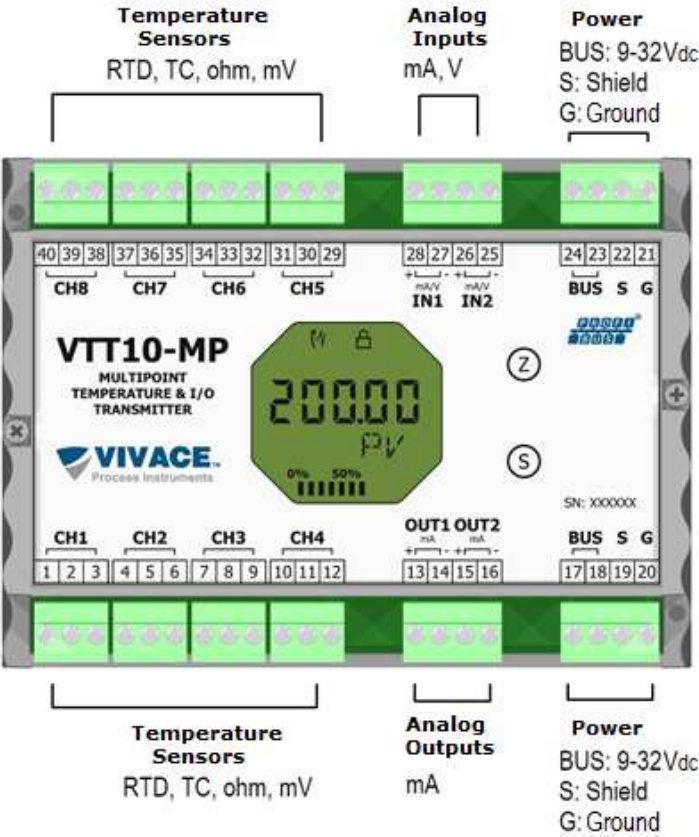
To mount the VTT10-MP on the DIN rail, user must fit its top part to the rail bracket and lightly press down on the bottom until it clicks into place.

To remove the VTT10-MP from the DIN rail, press it up and tilt its top out of the rail bracket.

2.2. ELECTRICAL CONNECTION

The electrical connection of the VTT10-MP is made through the side connectors, reserved for the sensors, the outputs and the electrical power of the equipment.

The following figure identifies the connectors of the VTT10-MP.




Terminal Description
Power Terminals - PWR BUS 9-32 Vdc not polarized
Grounding Terminals - G
Shield Terminals – S
Analog Input Terminals (Current or Voltage) – IN1 and IN2
4–20 mA Current Output Terminals – OUT1 and OUT2
Sensor Terminals – connections for temperature sensors, CH1 to CH8

Figure 2.2 – Connections and terminal description for VTT10-MP.


Table 2.1 – Terminal description for VTT10-MP.

NOTE



All cables used to connect VTT10-MP to Profibus-PA sensors and network must be shielded to avoid interference and noise.
All temperature sensors shall be isolated from the process to avoid interference or noise between the channels.

NOTE



It is extremely important to ground the equipment for complete eletromagnetic protection and also to ensure the correct performance of transmitter on Profibus-PA network.

2.3. PROCESS CONNECTION

The following shows VTT10-MP connections with different possible sensor types:

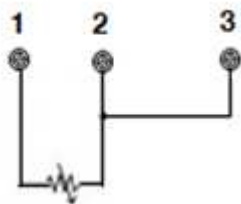


Figure 2.3 - RTD connection or 2-wire resistive.

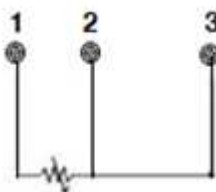


Figure 2.4 – RTD connection or 3-wire resistive.

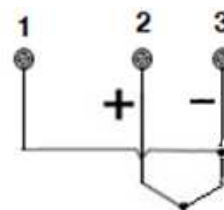


Figure 2.5 – TC connection or millivoltage.

NOTE



Unused channels of the temperature sensors shall be short-circuited to avoid induction of noise.

For the control of equipment using the generation 4-20 mA, connection must be executed according to the following diagram.

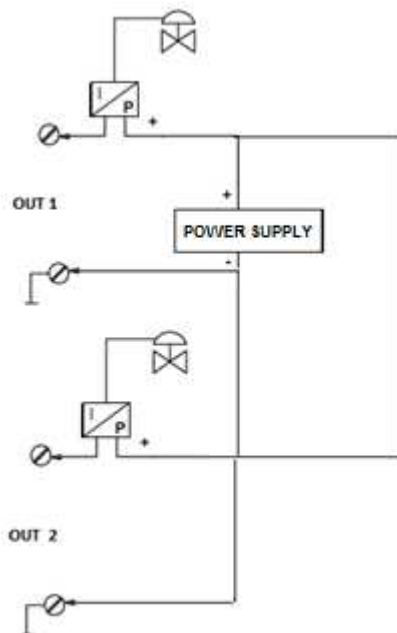


Figure 2.6 - 4 - 20 mA output connection to I/P device.

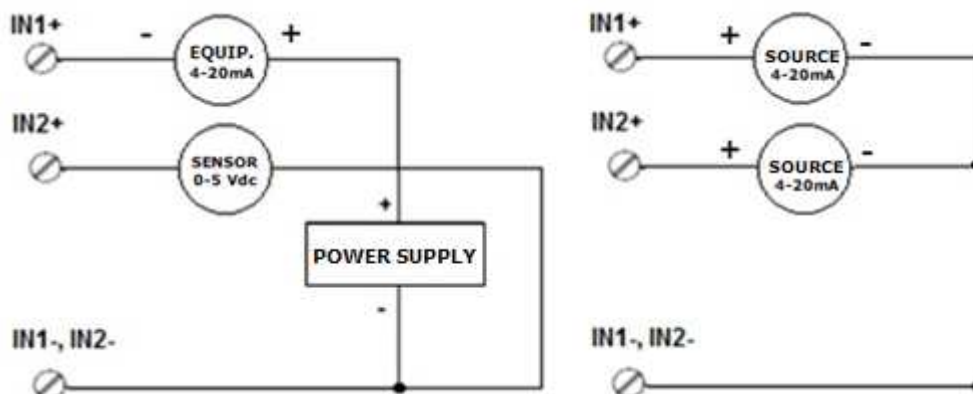


Figure 2.7 - 4 - 20 mA input connections using transmitter or mA source.

2.4. PROFIBUS-PA NETWORK CONNECTION

Figure 2.8 illustrates the installation of a number of Profibus network elements and the connection of Profibus-PA devices to the Profibus network.

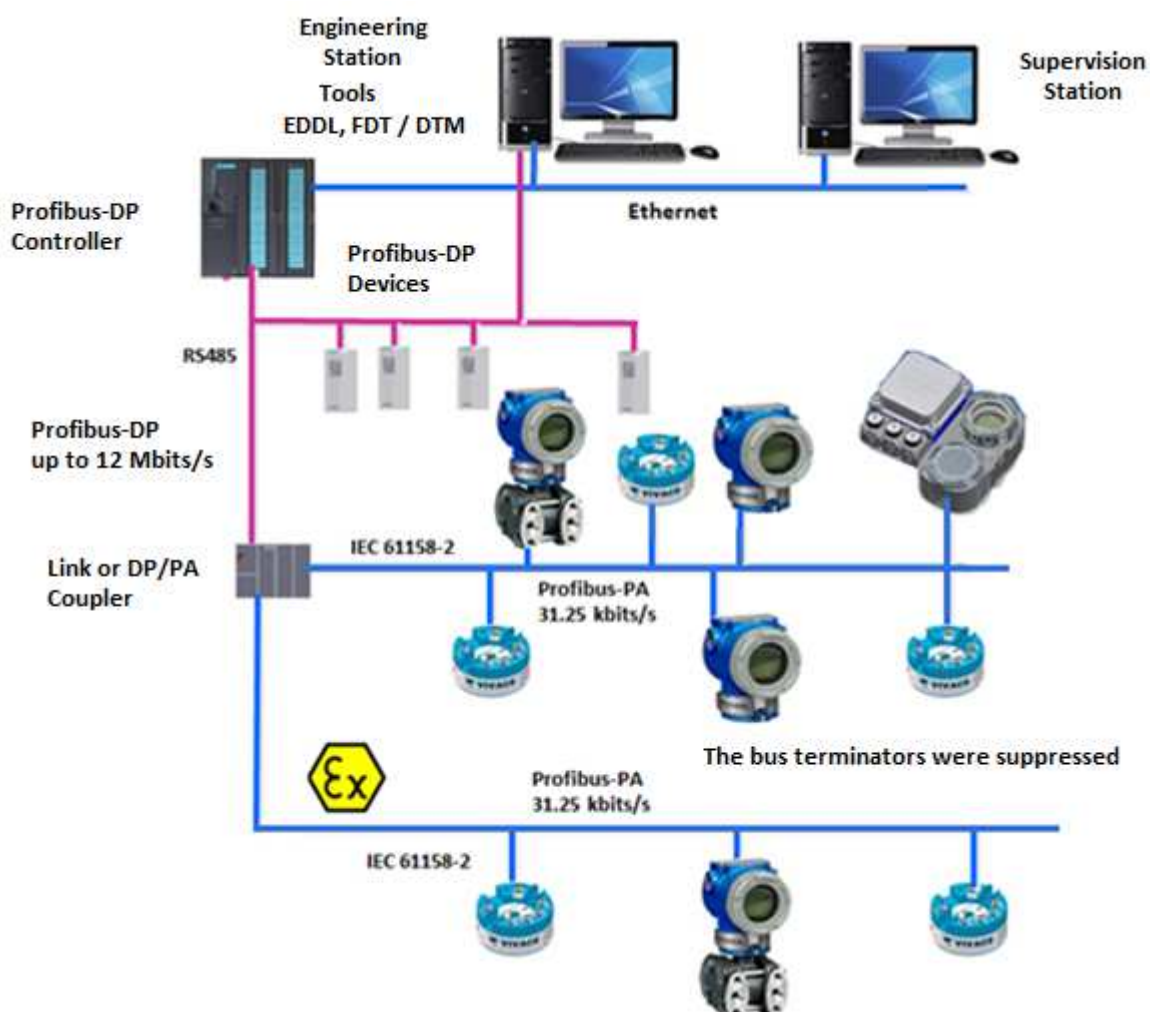


Figure 2.8 – Connecting a Profibus-PA device to the bus.

3 CONFIGURATION

The configuration of VTT10-MP can be done through a programmer compatible with Profibus-PA technology. Vivace offers the interfaces of VCI10-P line (USB, and Bluetooth) as a solution for configuration and monitoring of the Profibus-PA line equipment. User can also configure the VTT10-MP by local adjustment using a Vivace magnetic key.

3.1. LOCAL CONFIGURATION

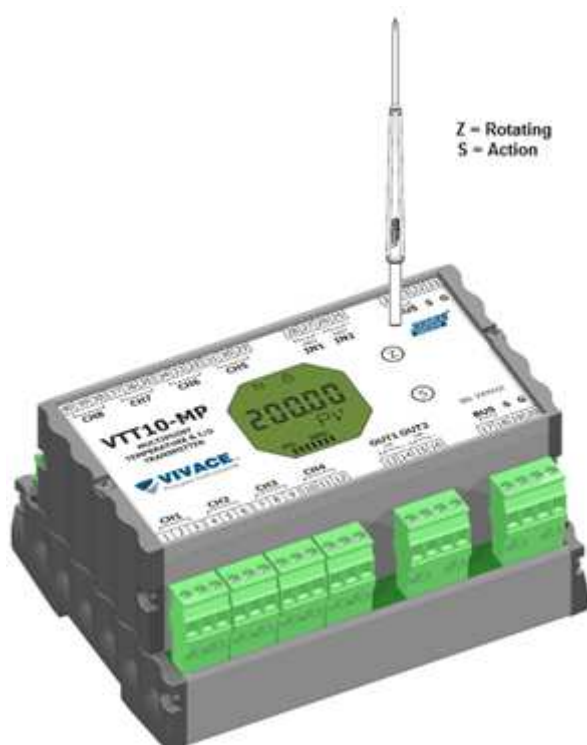


Figure 3.1 – Z and S orifices and magnetic screwdriver.

Equipment's local configuration is executed by using Vivace's magnetic screwdriver on Z and S orifices, located at housing superior side, under identification plate. Orifice Z starts local configuration and changes the field to be configured. Orifice S is responsible for changing and saving the new value on the selected field. Saving after LCD value changing is automatic.

Figure 3.1 shows orifices Z and S for local configuration, stamped on device housing, and their functions on magnetic screwdriver actuation.



Insert the magnetic screwdriver on *Zero* orifice (Z).  icon appears to indicate that device has recognized the screwdriver action. Keep the magnetic screwdriver inside until "LOCAL ADJUST" message is shown on display, and then remove it for 3 seconds. Insert the magnetic screwdriver into Z orifice again, so user can navigate through local adjust parameters.

Table 3.1 indicates actions executed by magnetic screwdriver when inserted on Z and S orifices.

ORIFICE	ACTION
Z	Select configuration tree function
S	Act on selected function

Table 3.1 – Z and S orifices actions.

Some parameters show the icon  to allow user configuration on it by inserting the magnetic screwdriver into *Span* orifice (S). In case the parameter has pre-defined values, those will be rotate on display, while the magnetic screwdriver remains into *Span* orifice (S).

If the parameter is numerical, this field will enter on edition mode and decimal point will start blinking, and shifting to left. When user removes magnetic screwdriver from S, the least significant digit (in the right) starts blinking, indicating it is ready for edition. By inserting the magnetic screwdriver into S, user is enabled to increase the digit value, from 0 to 9.

After the least significant digit edition, user should remove magnetic screwdriver from S in order to start the edition of the next digit (in the left). User will be able to edit each digit independently, until the most significant digit (5th digit on the left) is complete. After the 5th digit edition, user can also change the signal for the numerical value still on S orifice.

During each step of edition, user is able to return to the previous digit (to the right) by inserting the magnetic screwdriver into Z orifice, so corrections can be made. By removing the magnetic screwdriver at any time, user will see the digits blinking until the final step, where the edition mode will be finished, saving the numerical value configured by user.

If the configured value is not acceptable by that device parameter (invalid value), it will be returned to the last valid value before edition. Depending on the parameter, some values can be shown on numerical or alphanumerical fields, adjusting the best option view to user.

With the magnetic screwdriver out of Z and S orifices, device will leave local adjust mode after some seconds and monitoring mode will be shown.

3.2. JUMPER CONFIGURATION FOR LOCAL ADJUST AND WRITE PROTECTION

VTT10-MP has two jumpers on its main board to protect data writing (WP) and enabling/disabling local adjust (ADJL). Figure 3.2 presents those jumpers.

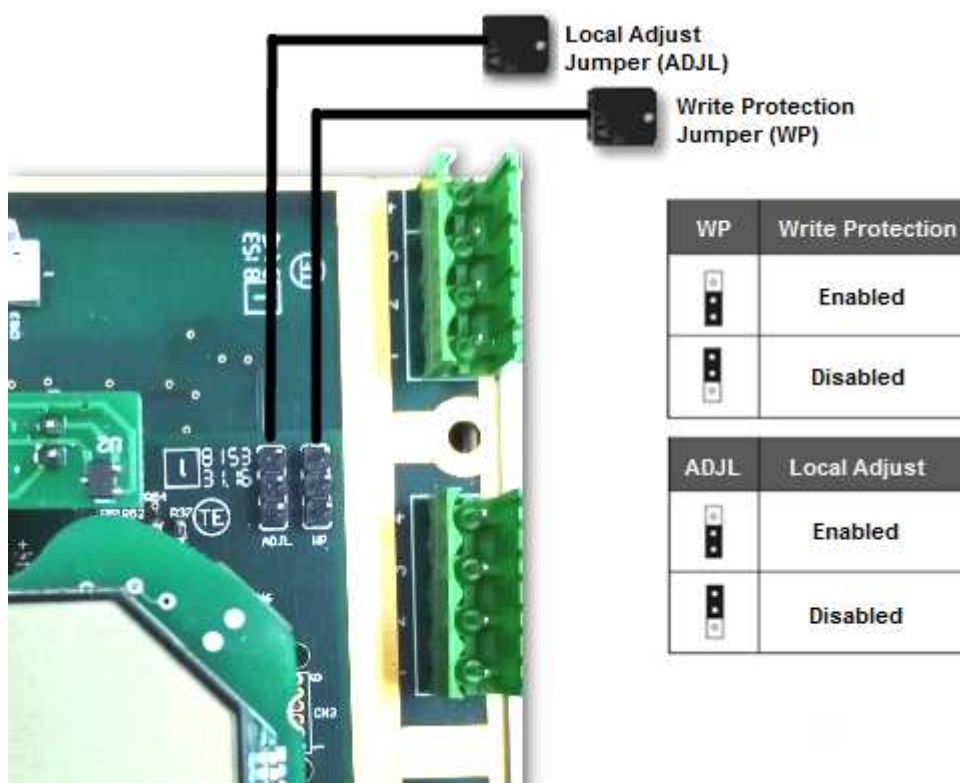


Figure 3.2 – Jumpers WP1 (write protection) and ADJL1 (local adjust) on VAP10 main board.



Default selection for these jumpers is Write Protection **DISABLED** and Local Adjust **ENABLED**.

3.3. LIQUID CRYSTAL DISPLAY (LCD)

Main information related to transmitter are indicated on its liquid crystal display (LCD). Figure 3.3 shows the LCD with all its indication fields. Numerical field has 5 digits and is used mainly for monitored variable indication. Alphanumerical field indicates which variable is being monitored, units or auxiliary messages. Each indication icon use is described on table 3.2.



Figure 3.3 – LCD fields and icons.

SYMBOL	DESCRIPTION
	Sending Communication
	Receiving communication
	Write protection enabled
	Square root function enabled
	Characterization table enabled
	Diagnostic occurrence
	Recommended maintenance
	Increment values in the local adjust
	Decrement values in the local adjust
	Degrees symbol for temperature units
	Bargraph to indicate the measured variable range

Table 3.2 – LCD icon description

3.4. LOCAL ADJUST CONFIGURATION TREE

Figure 3.4 shows available fields for local configuration and the sequence they are presented by magnetic screwdriver actuation on Z and S orifices.

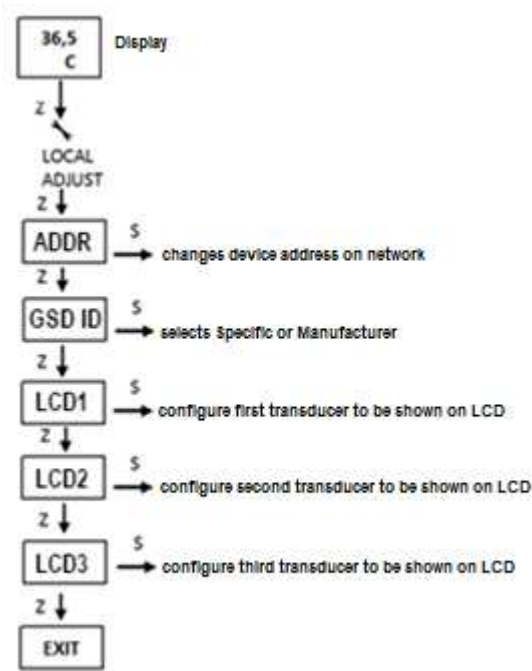


Figure 3.4 – Local adjust programming tree.

3.5. PROFIBUS PROGRAMMER

The configuration of the equipment can be done using a Profibus-PA compatible programmer. Vivace offers the interfaces of VCI10-P (USB and Bluetooth) line as a solution for identification, configuration and monitoring of Profibus-PA line equipment.

Figure 3.5 shows the wiring diagram for configuring VTT10-MP using Vivace VCI10-UP USB interface, which feeds the device in local mode, with a personal computer that has PACTware configurator software.



Figure 3.5 – Configuration diagram of VTT10-MP with VCI10-UP.

3.6. PROFIBUS-PA CONFIGURATOR PROGRAMMING TREE

The programming tree is a tree-shaped structure with a menu of all available software features, as shown in Figure 3.6

To configure transmitter online make sure that it is properly installed, with the proper power supply voltage, required for communication.

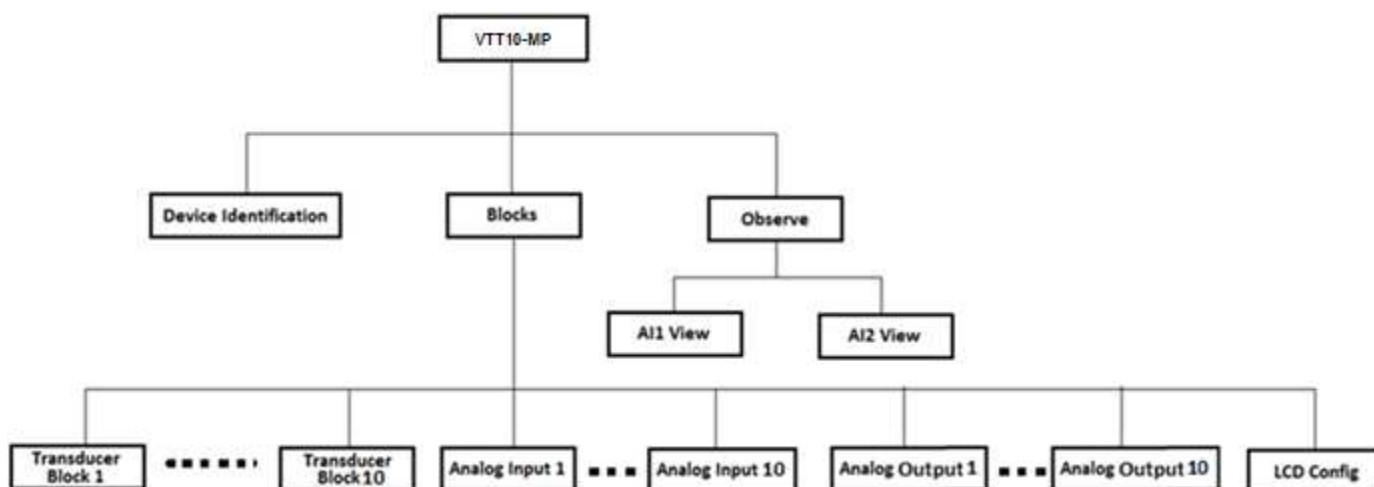


Figure 3.6 – VTT10-MP programming tree.

Device Identification - The main information about the transmitter can be accessed here, such as: Tag, Device ID, Ordering Code and Firmware Version.

Transducer Block 1 to 10 - Here the transducer block is configured, respectively.

- **Basic Settings** - In this menu the basic settings are set: Sensor Type and Sensor Connection Type.

Analog Input 1 to 10 - Here the parameters of the analog input block are set, respectively.

- **Basic Settings** - In this menu user can configure the Operation Mode, Output Scale (EU0% and EU100%), Unit, Channel and Damping.

Damping is an electronic filter for PV that changes transmitter response time to smooth output reading variations caused by rapid input variations. The damping value can be set between 0 and 60 seconds, and its appropriate value must be adjusted based on process response time, output signal stability and other system requirements. The default damping value is 0 seconds.

The value chosen for damping affects transmitter response time. When the value is set to zero, damping function is disabled and transmitter output will react immediately to changes in transmitter input, so the response time will be as short as possible.

Increasing the damping value leads to an increase in the transmitter response time.

At the time the damping time constant is set, the transmitter output will go to 63% of the input change and the transmitter will continue to approach the input value according to the damping equation.

- **Alarm/Warning** - The upper and lower Warning and Alarms Limits are set in this menu. The Hysteresis limit is also set. The measuring unit selected in the "Basic Settings" is indicated in this menu, as well as checking the current alarm status. The standard graphic of the process variable boundaries is also shown.
- **Fail Safe** - In this menu the fault safety type and fault safety value are set and the unit of measurement selected in the "Basic Settings" is displayed.
- **Simulate** - This menu enables or disables the Simulation function, sets the temperature value, shows the unit selected in the "Basic Settings" and the status.
- **Mode Block** - This menu shows the Target Operation Mode (manual, automatic or out of service) and Real, the value of the output variable in the unit selected in "Basic Settings" and the status is set. The current alarm status is also checked.

Analog Output 1/2 - Here the analog output block parameters 1 or 2 are configured, respectively.

- **Basic Settings** - In this menu you configure the Operation Mode, the Input Scale (EU0% and EU100%), the Unit.

LCD Config - Here the LCD display is configured for up to 3 variables: Monit 1, Monit 2 and Monit 3.

- **Monit x** - In these menus the function blocks (Physical, Transducer 1 to 10, Analog Input 1 to 10 or Analog Output 1 to 2) are configured, Relative Index, Element Type, mnemonic, decimal place number (1, 2, 3 or 4) and enable or disable the alphanumeric field.

3.7. FDT/DTM CONFIGURATION

FDT/DTM-based tool (Ex. PACTware®, FieldCare®) can be used for device information, configuration, monitoring, calibration and diagnosis with Profibus-PA technology. Vivace offers the DTM files for all of its devices (HART® and Profibus-PA).

PACTware® is property of *PACTware Consortium* and can be found on <http://www.vega.com/en/home br/Downloads>.

The following figures exemplify DTM configuration screens for VAP10 using Vivace's VCI10-UP interface and PACTware®.

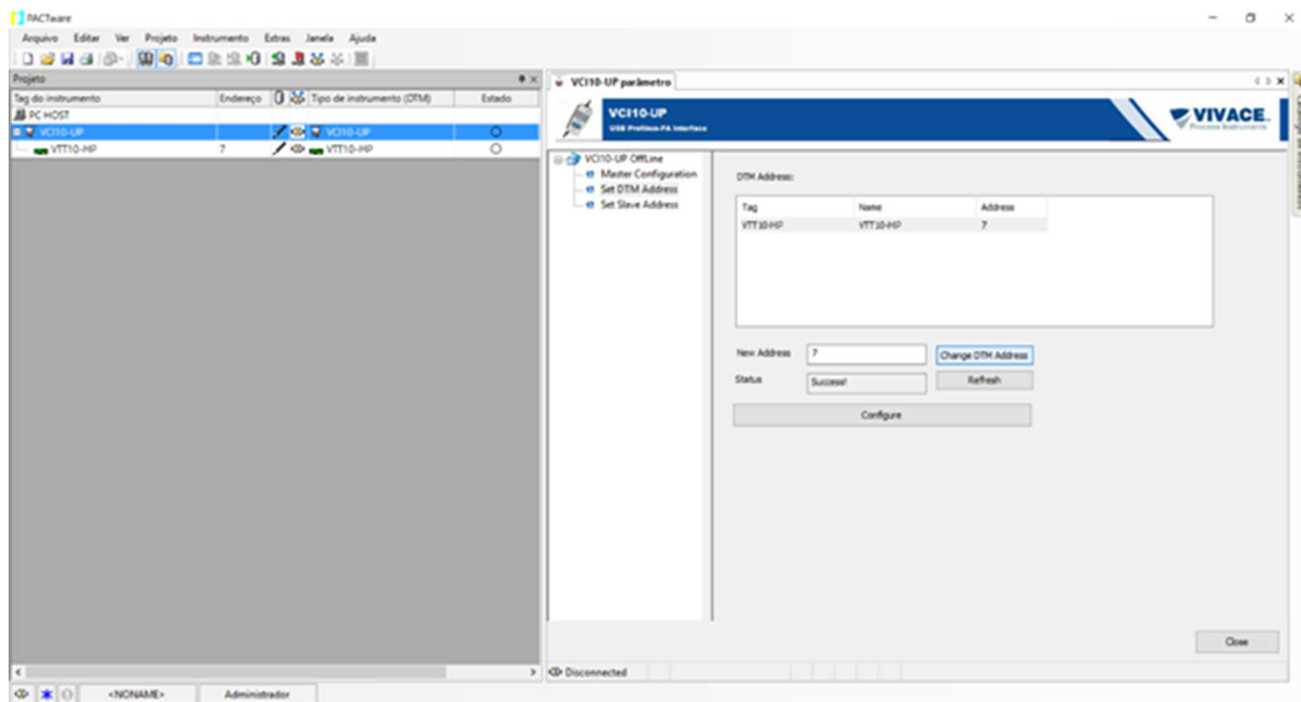


Figure 3.7 – Communication interface configuration screen on PACTware.

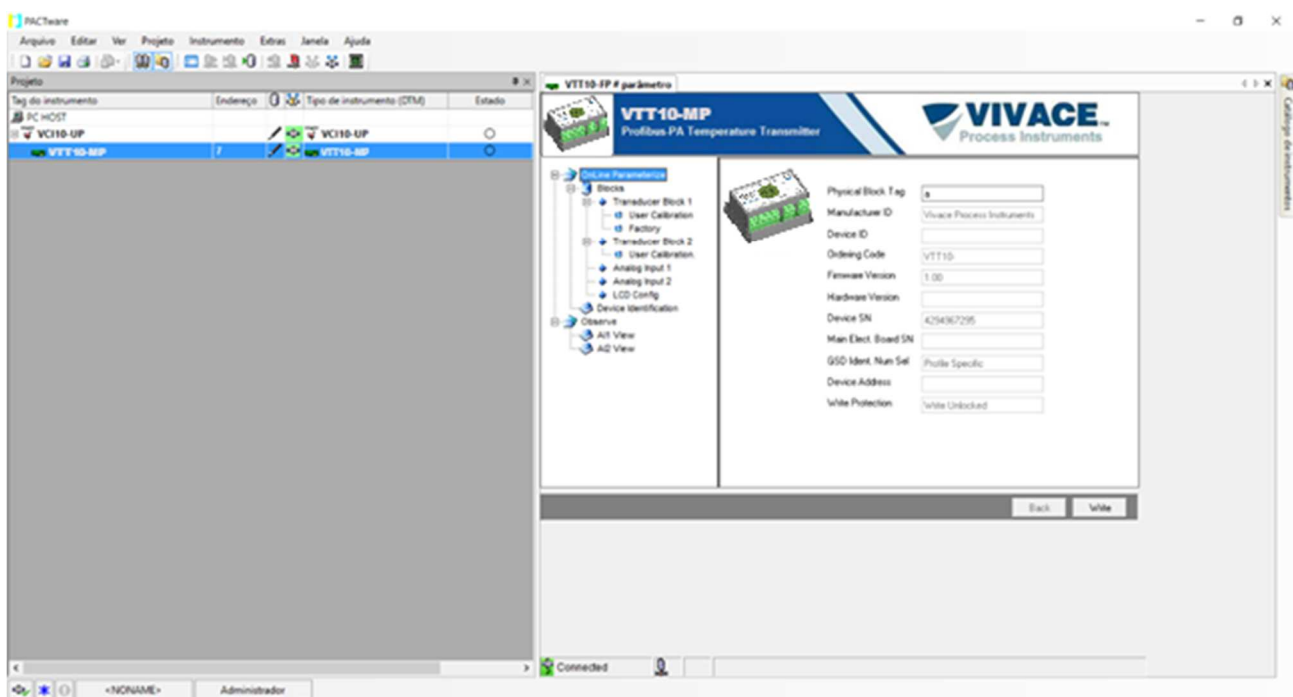


Figure 3.8 – Information screen for VTT10-MP on PACTware.

3.8. CYCLIC CONFIGURATION

VTT10-MP has 10 functional analog input blocks (10 AI - Analog Input Block) and 02 analog output blocks (02 AO - Analog Output Block). It also has the empty module (Empty Module) for applications where you want to configure only some of the blocks.

Of the 10 input blocks (AI), 8 are intended for temperature measurement and 2 for current (0-20 mA, 4-20 mA) or voltage (0-5 Vdc) inputs. The 2 output blocks (AO) are used to generate the 4-20 mA analog current outputs.

The following cyclic order of blocks must be respected: AO1, AO2, AI1 through AI10. Whenever a block is not used, the user must fill it with the empty module.

Most Profibus configurators use two directories where GSD and BITMAP files from various manufacturers are located. GSD and BITMAPS for Vivace equipment are available on Vivace website.

Follow the procedure below to integrate the VTT10-MP into a Profibus system (these steps apply to all Profibus-PA Vivace line devices).

- Copy the GSD file from the VTT10-MP to the directory where all the GSD files of the Profibus configurator are located, usually called "GSD";
- Copy the BITMAP file from the VTT10-MP to the directory where all the BMP files of the Profibus configurator equipment are located, usually called "BMP";
- After choosing the PROFIBUS-DP master, set the communication rate. Do not forget that DP/PA couplers can have the following communication rates: 45.45 kbits/s (Siemens), 93.75 kbits/s (P+F) and 12 Mbit/s (P+F, SK3). The IM157 link device can have up to 12 Mbits/s;
- Add the VTT10-MP and specify its address on the bus;
- Choose the cyclic configuration via parameterization, according to the GSD file, which depends on the application, as seen previously. For each AI block, the VTT10-MP provides the master with the process variable value in 5 bytes, the first four in the floating point format (IEEE-754) and the fifth byte forming the status that brings the quality information of this measurement.

In the case of the AO block, you can have several options, according to the GSD file. It is through the functional block of analog output (AO) that the class 1 master performs the cyclic services. The user must choose the configuration that best fits his application.

If the VTT10-MP's AO block is set to AUTO, it will receive the setpoint value and status of the class 1 master. In addition, the user can change this value via class 2 master if the setpoint status is equal to 0x80 ("good") and the following settings can be chosen:

```
SP;
SP / CHECKBACK;
SP / READBACK / POSD;
SP / READBACK / POSD / CHECKBACK.
```

If the AO block is in RCAS, the VTT10-MP will receive value and setpoint status (RCAS_IN) only via class 1 master, with the status always equal to 0xC4 ("IA"). The following settings can be chosen:

```
SP;
SP / CHECKBACK;
SP / READBACK / POSD;
SP / READBACK / POSD / CHECKBACK;
RCASIN / RCASOUT;
RCASIN / RCASOUT / CHECKBACK;
SP / READBACK / RCASIN / RCASOUT / POSD / CHECKBACK
```

- Some devices support the cyclic modules in the "long" and "short" formats. If there is a failure in the cyclic communication, check if by changing the chosen format, the communication is established successfully.

- If necessary activate the watchdog condition, which causes the equipment to assume a safe fault condition when it detects a loss of communication between the slave device and the Profibus-DP master.

Check byte swap condition (MSB with LSB inversion and, in some cases, nibble inversion), as for some systems it will be necessary on handling cyclic data.

VTT10-MP has the GSD identifier number equal to 0x0FB6 (Manufacturer Specific) and can still work with the value 0x9760 (Profile Specific). When initializing the VTT10-MP, it will show on your LCD display (after the address) whether you are as Specific Manufacturer or Profile Specific.

NOTE



This equipment has several functional blocks, so it is recommended to set the **number of retries to 3 or more**, in addition to increasing the slot time (indicates how long the PROFIBUS-DP master will wait for a response from the slave before resending a frame) in order to avoid retransmissions.

Link DP/PA

In a Profibus-DP network it is common to have Link Devices DP/PA to increase the communication rate up to 12 Mbit/s and to increase the addressing capacity, since these devices are slaves in the Profibus-DP network and Profibus-PA network. Each Link Device may have connected several DP/PA couplers.

Siemens has a Link device DP/PA which is the IM157 model. This device works with DP/PA coupler at a communication rate of 31.25 kbits/s and in the Profibus-DP network from 9.6 kbits/s to 12 Mbits/s. The IM157 and each coupler must be supplied with 24 Vdc. The maximum number of field devices per link is limited to 30 or 64 devices, but this depends on the model and the number of bytes exchanged cyclically.

When using the Link Device it is necessary to verify that the cyclic modules for Vivace Process Instruments equipment are included in your GSD file.

If they are not, they should be included. To do so, access the Siemens website and download the GSD tool. This is a tool that allows you to extend the GSD file from Siemens links devices (IM157, IM53) by adding the modules of new Profibus-PA devices that are not in the GSD file. You must have the GSD of the link device and the Vivace device in the directory where the GSD Tool was installed and when running, choose the option to extend the GSD file of the link device, choose the link model and GSD of the device and run. After execution, note that a section has been created for the Vivace equipment with its cyclic modules.

4 MAINTENANCE

VTT10-MP Temperature Transmitter, like all Vivace products, is rigorously evaluated and inspected before being shipped to the customer. However, in case of a malfunction, a diagnosis can be made to check whether the problem is located in the sensor installation, the equipment configuration or if it is a transmitter problem.

4.1. ASSEMBLY AND DISASSEMBLY PROCEDURES

Figure 4.1 shows in detail all components of the VTT10-MP. Before disassembling the equipment, make sure it is switched off. Maintenance should not be carried out on the electronic boards under penalty of loss of warranty of the equipment.

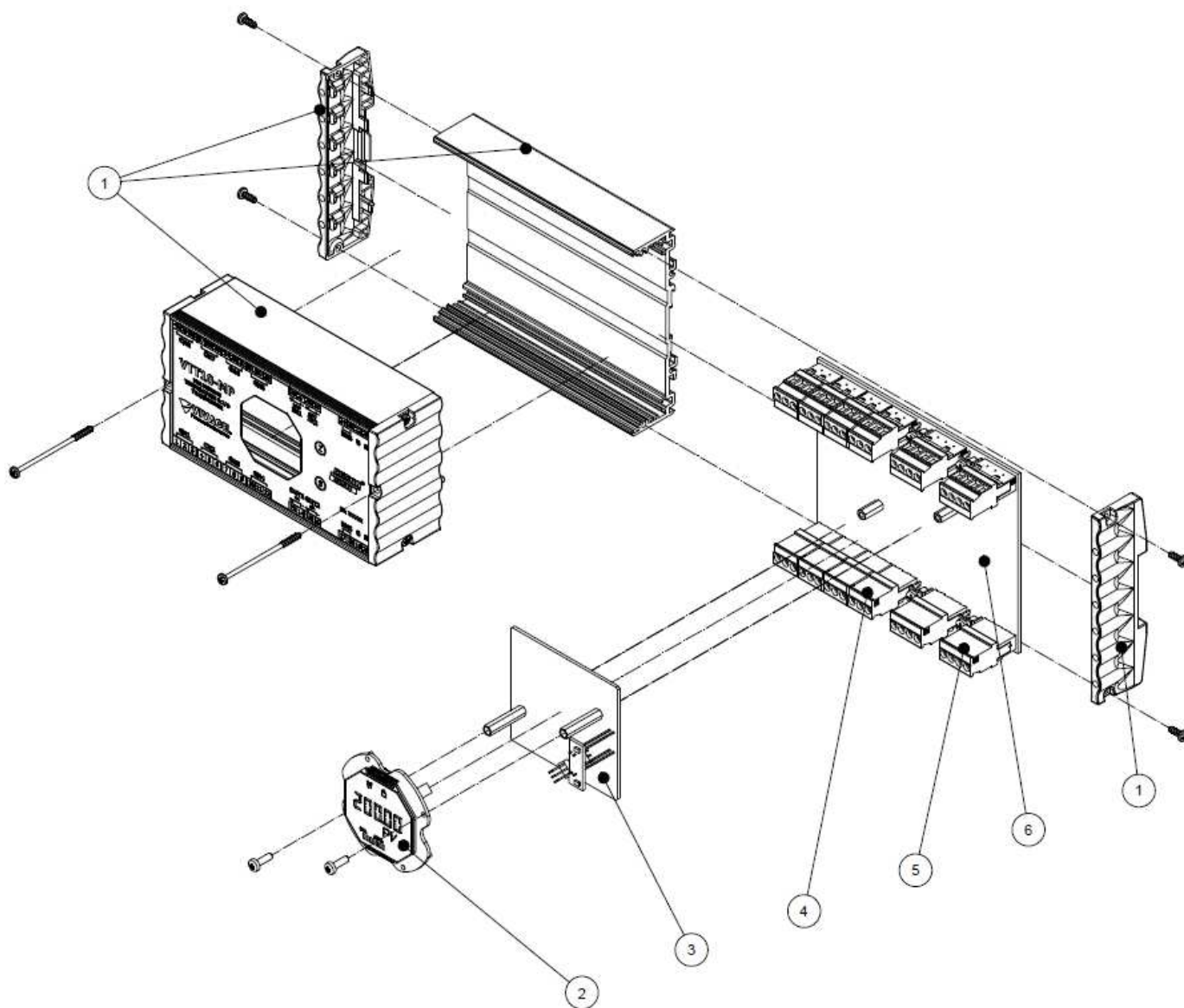


Figure 4.1 – Exploded view for VTT10-MP.

4.2. SPARE PARTS

The list of spare parts of the VTT10-MP that can be purchased directly from Vivace Process Instruments are listed in Table 4.1.

VTT10-MP – SPARE PARTS		
DESCRIPTION	DESCRIPTION FIG. 4.1	DESCRIPTION
HOUSING (includes screws)	1	2-10046
DISPLAY (includes screws)	2	2-10047
MAIN BOARD (includes spacers)	3	2-10048
TERMINAL BLOCK PLUG 3 POSITIONS	4	1-10012
TERMINAL BLOCK PLUG 4 POSITIONS	5	1-10013
ANALOG BOARD (includes headers, spacers and grounding terminals)	6	2-10049

Table 4.1 – List of spare parts for VTT10-MP.

5 CERTIFICATION

VTT10-MP was designed to meet national and international intrinsic safety standards.

Certificates are pending.

6 TECHNICAL CHARACTERISTICS

6.1. IDENTIFICATION

VTT10-MP has a label that identifies the equipment connections, its model and serial number, as well as showing the Z and S positions where the magnetic switch must be positioned to carry out the local adjustment, as shown in figure 6.1.

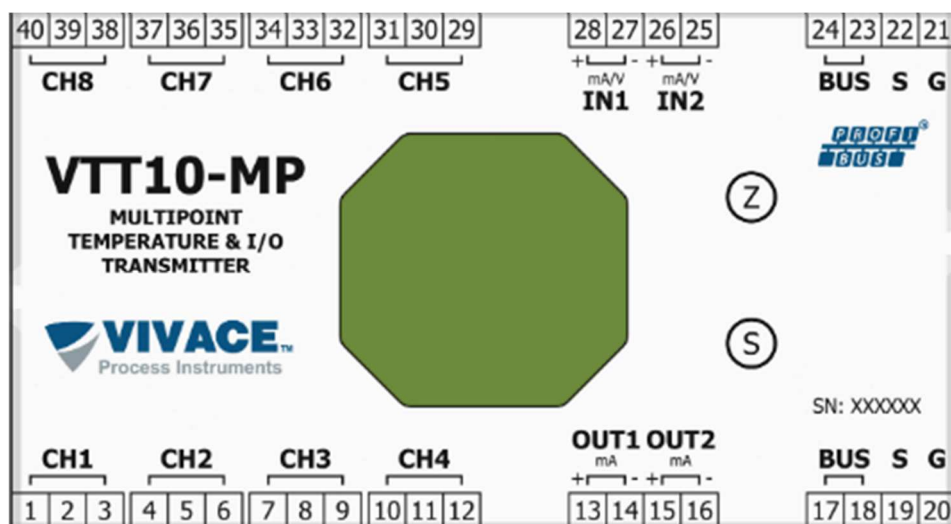


Figure 6.1 – Identification label of VTT10-MP.

6.2. TECHNICAL SPECIFICATION

The table below shows the technical specifications for VTT10-MP.

Accuracy	Temperature: According to Tables Above Inputs / Outputs: $\pm 0.1\%$ Span calibrated
Supply Voltage / Quiescent Current Output Load Limit	9 to 32 Vdc, without polarity / 12 mA Output signals 4-20mA: External Output Voltage 3-45 Vdc.
Protocol of Communication	Profibus-PA, according to IEC 61158-2
Certification in Hazardous Area	Explosion-proof and Intrinsically Safe (pending)
Ambient Temperature Limits	-20 to 70°C
Configuration / Function Blocks	Remote configuration through tools based on EDDL or FDT / DTM. Local configuration via magnetic key. 10 Analog Input Blocks (AI) 2 Analog Output Blocks (AO)
Mounting	In field or panel, using DIN rail
Degree of Protection	IP20
Type of Electrical Insulation (between Profibus-PA bus, inputs and outputs)	Galvanic Isolation, 1,5 kVac
Housing Material	Aluminum / Plastic
Approximate weight	540 g

Table 6.1 – Technical specifications for VTT10-MP.

6.3. COMPATIBLE SENSORS

The following tables list the types of sensors and their proper working ranges, plus the minimum range for correct operation and accuracy.

RTD – Temperature sensor based on resistance for 2 or 3-wire connection:

SENSOR OPTION	REFERENCE	INPUT RANGE (°C)	MINIMUM SPAN (°C)	ACCURACY (°C)
Pt100 ($\alpha=0.00385$)	IEC751	-200 to 850	10	0.10
Pt200 ($\alpha=0.00385$)	IEC751	-200 to 850	10	0.50
Pt500 ($\alpha=0.00385$)	IEC751	-200 to 850	10	0.20
Pt1000 ($\alpha=0.00385$)	IEC751	-200 to 300	10	0.20
Pt100 ($\alpha=0.003916$)	JIS1604	-200 to 645	10	0.15
Pt200 ($\alpha=0.003916$)	JIS1604	-200 to 645	10	0.70
Ni120	Edison Curve #7	-70 to 300	10	0.08
Cu10	Edison Copper Winding #15	-50 to 250	10	1.00

Table 6.2 – RTD's technical characteristics.

TC – Temperature sensor based on millivoltage for 2-wire connection:

SENSOR OPTION	REFERENCE	INPUT RANGES (°C)	MINIMUM SPAN(°C)	ACCURACY (°C)
Thermocouple B	IEC584	100 to 1820	25	0.75
Thermocouple E	IEC584	-50 to 1000	25	0.20
Thermocouple J	IEC584	-180 to 760	25	0.25
Thermocouple K	IEC584	-180 to 1372	25	0.25
Thermocouple N	IEC584	-200 to 1300	25	0.40
Thermocouple R	IEC584	0 to 1768	25	0.60
Thermocouple S	IEC584	0 to 1768	25	0.50
Thermocouple T	IEC584	-200 to 450	25	1.00
Thermocouple L	DIN43710	-200 to 900	25	0.35
Thermocouple U	DIN43710	-200 to 600	25	0.35
Thermocouple W3	ASTM E988-96	0 to 2000	25	0.70
Thermocouple W5	ASTM E988-96	0 to 2000	25	0.70
Thermocouple L	GOST R 8.585	-200 to 800	25	0.45

Table 6.3 – TC's technical characteristics.

Ohm or mV – Linear resistive or millivoltage sensor for 2 or 3-wire connection:

SENSOR OPTION	INPUT RANGES	ACCURACY
mV Input	-10 mV to 100 mV	0.015 mV
Ohm Input	0 Ohm to 2000 Ohm	0.45 Ohm

Table 6.4 – Technical characteristics for resistive or mV sensors.

6.4. ORDERING CODES

VTT10-M *Multipoint Temperature Transmitter*

Communication Protocol	P	PROFIBUS
Certification Type	0	NO CERTIFICATION
	1	INTRINSICALLY SAFE
	2	EXPLOSION PROOF
Certification Body	0	NO CERTIFICATION
	1	CEPEL
	2	FM
	3	EXAM
Protection Housing	0	NO HOUSING
	1	IP67 HOUSING

Ordering Code Example:

VTT10-M	P	-	0	0	0
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7 WARRANTY

7.1 GENERAL CONDITIONS

Vivace ensures its equipment from any defect on manufacturing or component quality. Problems caused by misuse, improper installation or exposure to extreme conditions are not covered by this warranty.

The user can repair some equipment by replacing spare parts, but it is strongly recommended to forward it to *Vivace* for diagnosis and maintenance in cases of doubt or impossibility of correction by the user.


For details about the product warranty, see the general term warranty on Vivace website: www.vivaceinstruments.com.br.

7.2 WARRANTY PERIOD

Vivace ensures the ideal operating conditions of their equipment by a period of two years, with full customer support regarding to installation, operation and maintenance for the best use of the equipment.

It is important to note that even after warranty period expires, *Vivace* assistance team is ready to assist customer with the best support service, offering the best solutions for the installed system.

APPENDIX

		FSAT Technical Analysis Solicitation Form	
Company:		Unit/Department:	
Standard Warranty: ()Yes ()No		Extended Warranty: ()Yes ()No	
		Shipping Invoice n°:	
		Buying Invoice n°:	
COMMERCIAL CONTACT			
Complete Name:		Position:	
Phone and Extension:		Fax:	
e-mail:			
TECHNICAL CONTACT			
Complete Name:		Position:	
Phone and Extension:		Fax:	
e-mail:			
EQUIPMENT DATA			
Model:		Serial Num.:	
PROCESS INFORMATION			
Environment Temperature (°C)		Work Temperature (°C)	
Min:	Max:	Min:	Max:
Operation Time:		Fail Date:	
FAIL DESCRIPTION: Here user should describe in detail the observed behaviour of product, frequency of fail occurrence and repeatability. Also, should inform operational system version and a quick description of control system architecture where the equipment was installed.			
ADDITIONAL OBSERVATION:			

