

No.:

2633M

Version:

191211

System / Product:

MIREL Electronic Systems

Title:

TZJ.1 Operating manual

Further source- and enclosed files:

File	Description	Pages Connection	/
1			
2			
3			

The document form is based on template VTDO: 170406

List of document versions:

Version	Description	Compiled by	Validated by	Approved by
190315	Document introduction	Ing. Zemanovič	Ing. Žilinec	Ing. Michalec
191211	Correction of Table in Chapter 4.2	Ing. Zemanovič	Ing. Žilinec	Ing. Michalec

Obsah

1	Purpose of the Document	3
2	Specification of Document Changes	4
3	Applied Designation and Terminology	5
4	General Characteristics	6
4.1	Device Nameplate Data	6
4.2	Device Arrangement and Accessories	6
4.2.1	Central Unit Test Device TZJ.1.0	6
4.2.2	TZJB.1.R1	7
4.2.3	TZJB.1.S0	8
4.2.4	TZJB.1.S1	8
4.2.5	TZJP.1.C25F	8
4.2.6	TZJP.1.C25M	9
4.2.7	TZJP.1.C37F	9
4.2.8	TZJP.1.C37M	9
4.2.9	TZJP.1.DD72F	10
4.2.10	TZJP.1.DD72M	10
4.2.11	TZJP.1.H3A	10
4.2.12	TZJP.1.H3B	11
4.2.13	TZJP.1.H3C	11
4.2.14	TZJP.1.H3D	11
5	Operation of Device TZJ.1	12
5.1	Safety Instructions	12
5.2	Connection of TZJ to Tested Device	12
5.2.1	Connection of Test Device External Power Supply	12
5.2.2	Voltage Measurement on Signal Path	12
5.2.3	Current Measurement on Signal Path	13
5.2.4	Enforcement of Defined Signal Status	13
6	Maintenance and Repairs	14

1 Purpose of the Document

The document specifies method and conditions for operation and maintenance of TZJ.1 device.

The document follows up and refers to documentation stated below:

No.	Version	Title
[1] 2631M	-	TZJ Catalogue Sheet

The document is intended for personnel of:

- MIREL systems Producer, who provide for tests, final inspection, installation and activation, warranty and post-warranty service as well as periodical MIREL systems maintenance. Personnel must be traceably appointed for this activity and trained by the MIREL Systems Producer.
- Operator, who provide for operating maintenance, diagnostics as well as operational repair of MIREL systems. Personnel must be traceably appointed for this activity and trained by the Operator.

2 Specification of Document Changes

Version 190315

Document introduction.

Version 191211

Correction of Table in Chapter 4.2.

3 Applied Designation and Terminology

2G	Second generation
3G	Third generation
AI	Analogue inputs
AO	Analogue outputs
BI	Binary inputs
BO	Binary outputs
DRV	Driving rail vehicle
SIO	Serial communication line, generally
TZJ	Central unit tester

4 General Characteristics

Systems test device MIREL TZJ is a portable test device from MIREL systems product line. It has been designed for testing of all MIREL 2G and 3G systems.

Function of MIREL TZJ device is provision of interface between system to be tested, for purposes of additional diagnostics. Interface has been executed as a contact field, which allows execution of additional measurements aided by external measuring instruments, or wiring simulation of analogue and digital signals.

For its operation the device doesn't require any power source and device operation is maintenance-free. The applied component base meets demanding criteria of reliability and durability.

4.1 Device Nameplate Data

System designation	MIREL TZJ
Producer	HMH s.r.o.
Year of production	specific part data
Serial No.	specific part data
Type	specific part data
Un	24/48V

4.2 Device Arrangement and Accessories

TZJ device is manufactured as a set, comprising accessories. Set TZJSET.1.x comprises central unit test device – wiring box TZJ.1.0 with accessories, as outlined in TZJ Catalogue Sheet [1]. Following set components are produced:

Designation	Description
TZJ.1.0	Central unit test device – wiring box, version 1
TZJB.1.R1	Test cable 1,0m, 2x 4mm banana plug, 1,0m, DC open
TZJB.1.S0	Test cable 0,5m, 1x 4mm banana plug, 0,5m, DC short-circuit
TZJB.1.S1	Test cable 1,0m, 1x 4 mm banana plug, 1,0m, DC short-circuit
TZJP.1.C25F	Connection cable 1,0m, outlet to DSub-25 connector jacks
TZJP.1.C25M	Connection cable 1,0m, outlet to DSub-25 pins
TZJP.1.C37F	Connection cable 1,0m, outlet to DSub-37 connector jacks
TZJP.1.C37M	Connection cable 1,0m, outlet to DSub-37 pins
TZJP.1.DD72F	Connection cable 1,0m, outlet to DD72F connector jacks
TZJP.1.DD72M	Connection cable 1,0m, outlet to DD72M pins
TZJP.1.H3A	Connection cable 1,0m, DSub-37M for HUMMEL FF ₍₁₋₁₀₎ a HUMMEL MM ₍₁₁₋₂₀₎ ¹⁾
TZJP.1.H3B	Connection cable 1,0m, DSub-37M for HUMMEL MM ₍₁₋₁₀₎ a HUMMEL FF ₍₁₁₋₂₀₎ ¹⁾
TZJP.1.H3C	Connection cable 1,0m, DSub-37M for HUMMEL MF ₍₁₋₁₀₎ a HUMMEL FM ₍₁₁₋₂₀₎ ¹⁾
TZJP.1.H3D	Connection cable 1,0m, DSub-37M for HUMMEL FM ₍₁₋₁₀₎ a HUMMEL MF ₍₁₁₋₂₀₎ ¹⁾

¹⁾ *F – connector inserts with jacks; *M – insert with pins; F* - connector housing with internal thread; M* - connector housing with external thread

4.2.1 Central Unit Test Device TZJ.1.0

Electronics body of TZJ device is formed by robust plastic box with metallic rear panel intended for eventual fixation. Connectors are located on front and lateral device panels. Front panel features wiring nut, auxiliary connectors of power supply and of shielding (Fig. 1).

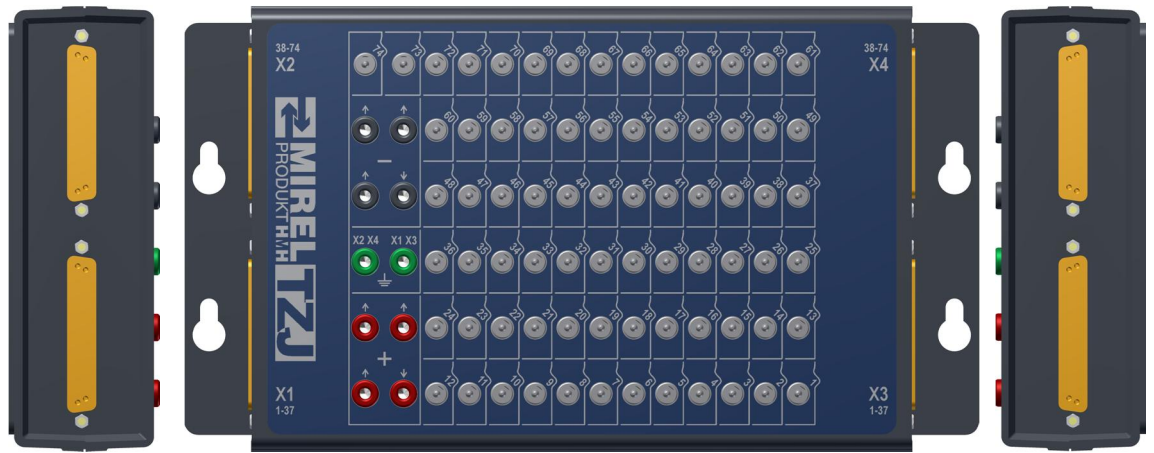









Fig. 1 TZJ.1.0 Central unit test device – wiring box

Description of TZJ.1.0 connectors:

- X1 – DSub-37F connector **device** side conducted to internal connector contact of contact field No. 1-37.
- X2 – DSub-37F connector **device** side conducted to internal connector contact of contact field No. 38-74.
- X3 – DSub-37F connector **technology** side conducted to external connector contact of contact field No.1-37.
- X4 – DSub-37F connector **technology** side conducted to external connector contact of contact field No.38-74.
- 1 – 74 – contact field connectors.
- Group of red jacks  - 4mm jack marked with  serves as input one for connection of voltage/signal. Pins marked with  serve as output ones. A 2A PPTC fuse is arranged between input and output jacks. The group serves primarily for connection of supply voltage + pole.
- Group of green jacks  - 4mm jacks are wired so, that jack marked as **X1 X3** is wired to shielding of connectors X1 and X3. Jack marked **X2 X4** is wired to shielding of connectors X2 and X4.
- Group of black jacks  - 4mm jack marked with  serves as input one for connection of voltage/signal. Pins marked with  serve as output ones. A 2A PPTC fuse is arranged between input and output jacks. The group serves primarily for connection of supply voltage + pole.

When using the device it must be remembered that connectors X1 and X2 are primarily intended for connection to tested device and connectors X3 and X4 are intended for connection to technology (supply cables conducted to device). Apart from that it is recommended to use for connection of input voltages/signals jacks marked with an arrow in square and to distribute voltages/signals from remaining protected pins marked with arrows without square.

4.2.2 TZJB.1.R1

Open yellow-green cable TZJB.1.R1 (Fig. 2) serves for signal path interruption and conduction of technology and system section to 4mm banana plugs. Cable is 1m long, at one end terminated with connector PC712AH, which serves for wiring to TZJ contact field. The cable is branched at the other end terminated with 4mm banana plugs, which serve for wiring to external measuring instrument, or for

connection of analogue/digital signals. The yellow banana plug is connected to device side (internal contact of contact field) and the green one to technology side (external contact of contact field).



Fig. 2 Illustrative picture of TZJB.1.R1

4.2.3 TZJB.1.S0

A grouped blue cable TZJB.1.S0 (Fig. 3) is used to create a branch line of specific signal without its interruption and for its connection to 4mm banana plug. Cable is 0,5m long, at one end terminated with connector PC712AH, which serves for wiring to TZJ contact field. At the other end the cable is terminated with a 4mm banana plug, which serves for wiring to external measuring instrument, or for connection of analogue/digital signals. Blue united cables of 0,5m length are primarily intended for connection/conduction of system supply voltage.



Fig. 3 Illustrative picture of TZJB.1.Sx

4.2.4 TZJB.1.S1

A grouped blue cable TZJB.1.S1 (Fig. 3) is used to create a branch line of specific signal without its interruption and for its connection to 4mm banana plug. Cable is 1m long, at one end terminated with connector PC712AH, which serves for wiring to TZJ contact field. At the other end the cable is terminated with a 4mm banana plug, which serves for wiring to external measuring instrument, or for connection of analogue/digital signals.

4.2.5 TZJP.1.C25F

Cable TZJP.1.C25F (Fig. 4) serves for connection of device/technology to TZJ in order to wire them to contact field. Cable is 1m long, at one end terminated with connector DSub-37M, which serves for wiring to TZJ. At the other end the cable is terminated with DSub-25F, which serves for connection to

device/technology. Cable is wired in such a way, that jacks 1-25 of connector DSub-25F are wired with pins 1-25 of connector DSub-37M in sequence 1-1, 2-2, 3-3 ... 25-25. Remaining pins of connector DSub-37M are not wired. Connector shields are conductively connected with cable braiding.



Fig. 4 Illustrative picture of TZJP.1.C25x

4.2.6 TZJP.1.C25M

Cable TZJP.1.C25M (Fig. 4) serves for connection of device/technology to TZJ in order to wire them to contact field. Cable is 1m long, at one end terminated with connector DSub-37M, which serves for wiring to TZJ. At the other end the cable is terminated with DSub-25M, which serves for connection to system/technology. Cable is wired in such a way, that pins 1-25 of connector DSub-25M are wired with pins 1-25 of connector DSub-37M in sequence 1-1, 2-2, 3-3 ... 25-25. Remaining pins of connector DSub-37M are not wired. Connector shields are conductively connected with cable braiding.

4.2.7 TZJP.1.C37F

Cable TZJP.1.C37F (Fig. 5) serves for connection of device/technology to TZJ in order to wire them to contact field. Cable is 1m long, at one end terminated with connector DSub-37M, which serves for wiring to TZJ. At the other end the cable is terminated with DSub-37F, which serves for connection to system/technology. Cable is wired 1:1. This means that jacks 1-37 of DSub-37F connector are wired to pins 1-37 of DSub-37M connector in sequence 1-1, 2-2, 3-3 ... 37-37. Connector shields are conductively connected with cable braiding.

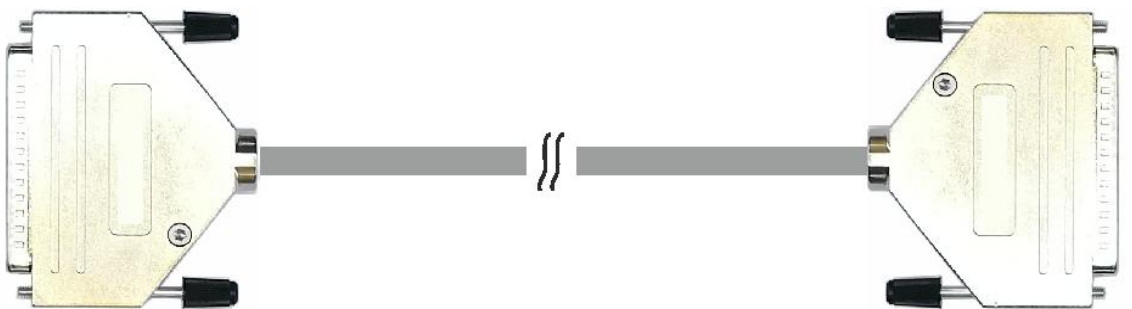


Fig. 5 Illustrative picture of TZJP.1.C37x

4.2.8 TZJP.1.C37M

Cable TZJP.1.C37M (Fig. 5) serves for connection of device/technology to TZJ in order to wire them to contact field. Cable is 1m long, at one end terminated with connector DSub-37M, which serves for wiring to TZJ. At the other end the cable is terminated with DSub-37M, which serves for connection to system/technology. Cable is wired 1:1. This means that pins 1-37 of DSub-37M connector are wired to pins 1-37 of DSub-37M connector in sequence 1-1, 2-2, 3-3 ... 37-37. Connector shields are conductively connected with cable braiding.

4.2.9 TZJP.1.DD72F

Cable TZJP.1.DD72F (Fig. 6) serves for wiring of DD72M device connectors to TZJ in order to wire them to contact field. Cable is 1m long, at one end terminated with connector DD72F, which serves for wiring to device to be tested. At the other end the cable is branched in two parts, which are terminated with connectors DSub-37M intended for connection to TZJ. Cable is wired in such a way, that jacks 1-37 of DD72F connector are wired with pins 1-37 of connector Dsub-37M marked C1/1-37 in sequence 1-1, 2-2, 3-3 ... 37-37. Jacks 38-72 of connector DD72F are wired to pins 1-37 of connector Dsub-37M marked C2/38-72 in sequence 38-1, 39-2, 40-3 ... 72-35. Remaining pins of connector DSub-37M marked as C2/38-72 are not wired. Connector shields are conductively interlinked.



Fig. 6 Illustrative picture of TZJP.1.DD72F

4.2.10 TZJP.1.DD72M

Cable TZJP.1.DD72M (Fig. 7) serves for wiring of DD72F technology connectors to TZJ in order to wire them to contact field. Cable is 1m long, at one end terminated with connector DD72M, which serves for wiring to device to be tested. At the other end the cable is branched in two parts, which are terminated with connectors DSub-37M intended for connection to TZJ. Cable is wired in such a way, that pins 1-37 of connector DD72M are wired with pins 1-37 of connector Dsub-37M marked C1/1-37 in sequence 1-1, 2-2, 3-3 ... 37-37. Pins 38-72 of connector DD72M are wired to pins 1-37 of connector Dsub-37M marked as C2/38-72 in sequence 38-1, 39-2, 40-3 ... 72-35. Remaining pins of connector DSub-37M marked as C2/38-72 are not wired. Connector shields are conductively interlinked.

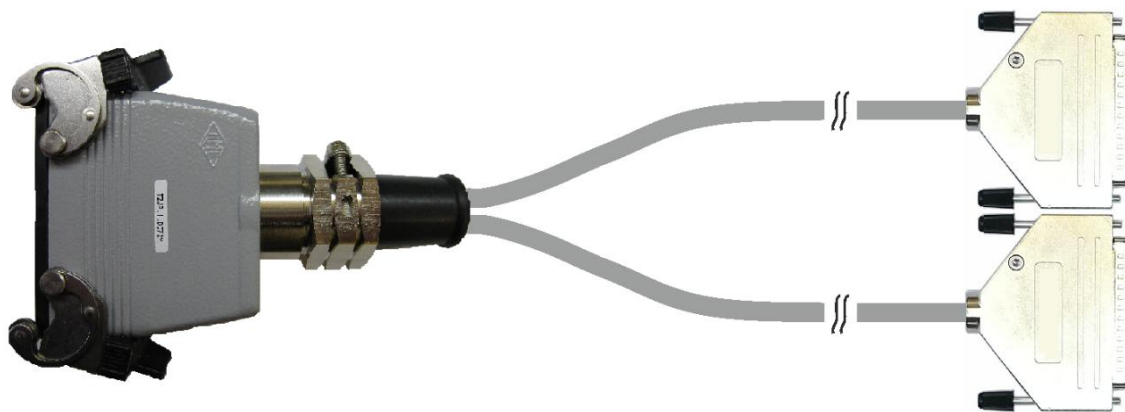


Fig. 7 Illustrative picture of TZJP.1.DD72M

4.2.11 TZJP.1.H3A

Cable TZJP.1.H3A (Fig. 8) serves for wiring of system/technology HUMMEL connectors to TZJ in order to wire them to contact field. Cable is 1m long, at one end terminated with connector DSub-37M, which serves for wiring to TZJ. At the other end the cable is branched in two parts. First is terminated with

connector HUMMEL FF marked as H1/1-10, second is terminated with connector HUMMEL MM marked as H1/11-20. Cable is wired in such a way, that jacks 1-10 of connector HUMMEL FF marked as H1/1-10 are wired to pins 1-10 of connector DSub-37M. Pins 1-10 of connector HUMMEL MM marked as H2/11-20 are wired to pins 11-20 of connector DSub-37M. Remaining pins of connector DSub-37M are not wired. Shields of connectors HUMMEL and DSub-37M are conductively connected with cable braiding.

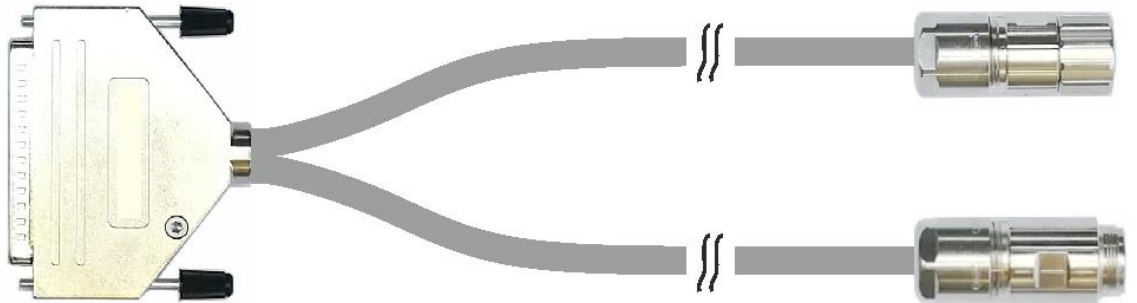


Fig. 8 Illustrative picture of TZJP.1.H3x

4.2.12 TZJP.1.H3B

Cable TZJP.1.H3B (Fig. 8) serves for wiring of system/technology HUMMEL connectors to TZJ in order to wire them to contact field. Cable is 1m long, at one end terminated with connector DSub-37M, which serves for wiring to TZJ. At the other end the cable is branched in two parts. First is terminated with connector HUMMEL MM marked as H1/1-10, second is terminated with connector HUMMEL FF marked as H1/11-20. Cable is wired in such a way, that pins 1-10 of connector HUMMEL MM marked as H1/1-10 are wired to pins 1-10 of connector DSub-37M. Jacks 1-10 of connector HUMMEL FF marked as H2/11-20 are wired to pins 11-20 of connector DSub-37M. Remaining pins of connector DSub-37M are not wired. Shields of connectors HUMMEL and DSub-37M are conductively connected with cable braiding.

4.2.13 TZJP.1.H3C

Cable TZJP.1.H3C (Fig. 8) serves for wiring of system/technology HUMMEL connectors to TZJ in order to wire them to contact field. Cable is 1m long. At one end it is terminated with connector DSub-37M, which serves for wiring to TZJ. At the other end the cable is branched in two parts. First is terminated with connector HUMMEL MF marked as H1/1-10, second is terminated with connector HUMMEL FM marked as H1/11-20. Cable is wired in such a way, that jacks 1-10 of connector HUMMEL MF marked as H1/1-10 are wired to pins 1-10 of connector DSub-37M. Pins 1-10 of connector HUMMEL FM marked as H2/11-20 are wired to pins 11-20 of connector DSub-37M. Remaining pins of connector DSub-37M are not wired. Shields of connectors HUMMEL and DSub-37M are conductively connected with cable braiding.

4.2.14 TZJP.1.H3D

Cable TZJP.1.H3D (Fig. 8) serves for wiring of system/technology HUMMEL connectors to TZJ in order to wire them to contact field. Cable is 1m long. At one end it is terminated with connector DSub-37M, which serves for wiring to TZJ. At the other end the cable is branched in two parts. First is terminated with connector HUMMEL FM marked as H1/1-10, second is terminated with connector HUMMEL MF marked as H1/11-20. Cable is wired in such a way, that pins 1-10 of connector HUMMEL FM marked as H1/1-10 are wired to pins 1-10 of connector DSub-37M. Jacks 1-10 of connector HUMMEL MF marked as H2/11-20 are wired to pins 11-20 of connector DSub-37M. Remaining pins of connector DSub-37M are not wired. Shields of connectors HUMMEL and DSub-37M are conductively connected with cable braiding.

5 Operation of Device TZJ.1

5.1 Safety Instructions

Device can be operated only by a person, which has been instructed about safety at work with this device and must be demonstrably appointed and trained for this purpose and for work with MIREL systems.

Each person conducting diagnostics of MIREL systems must be instructed about occupational safety, must be demonstrably trained for this activity and for execution of individual system diagnostic levels.

When working with, handling and transferring the device, please adhere to general rules concerning occupational safety and health protection.

When working close to DRV and on railyard instructions regarding OSH in this environment must be followed.

The TZJ device and its accessories must be used only for purpose intended by Producer.

Only Producer approved device accessories can be used for work with it.

Connection of test device to device to be tested and to DRV is allowed only with accessories approved by Producer.

Please inspect product regularly for eventual damage or wear. Do not continue using a damaged or worn product.

5.2 Connection of TZJ to Tested Device

TZJ is wired between device to be tested and the technology cabling by means of suitable combination of cables from accessories. Please pay regard to the fact, that connectors X1 and X2 are primarily intended for connection to tested device and connectors X3 and X4 are intended for connection to technology (by means of supply cable leading to device). Assignment of individual signals and in this way also their wiring to contact field is governed by valid wiring diagram for the given DRV type and applied accessories cables. If there isn't any signal artificially enforced into the contact field, or interrupted by means of cable TZJB.1.R1, then the system operates without any functional alteration.

5.2.1 Connection of Test Device External Power Supply

If it is necessary to power the device to be tested from an external source, then red and black jacks have to be used for this purpose. The negative source pole can be wired to black jack (■) marked with ▼ by means of cable. Then, by means of cable TZJB.1.S0 the signal can be applied on a specific contact field connector from any black jack marked with ▲. Positive source pole is connected with cable to red jack (■) marked with ▼. Then, by means of cable TZJB.1.S0 the supply power can be applied on a specific contact field connector from any red jack marked with ▲. Wiring spot of positive and negative source pole to contact field is governed by valid wiring diagram for the given DRV type and applied accessories cables.

5.2.2 Voltage Measurement on Signal Path

Voltage on signal path is measured by means of an external voltmeter and applied cables TZJB.1.S0/1. First of cables, TZJB.1.S0/1 is connected to the signal in contact field, which is wired to reference potential and is connected in the respective jack of external voltmeter. Second of cables TZJB.1.S0/1, is connected to the signal in contact field, on which we want to measure voltage and is connected in the respective jack

of external voltmeter. Wiring spot of reference potential and of respective signal to contact field is governed by valid wiring diagram for the given DRV type and applied accessories cables.

5.2.3 Current Measurement on Signal Path

Current on signal path is measured by means of an external ammeter and applied cable TZJB.1.R1. The cable TZJB.1.R1 is connected to the signal in contact field, on which we want to measure current. Yellow and green banana plugs are connected to respective jacks of external ammeter. The yellow banana plug is connected to device to be measured and green one to technology. The sign of measured current depends on method of wiring to external ammeter. Regard has to be paid to the fact, that after connecting the cable, TZJB.1.R1 to contact field, the respective signal path is interrupted for the time when the external ammeter isn't connected. Wiring spot of cable TZJB.1.R1 to contact field is governed by valid wiring diagram for the given DRV type and applied accessories cables.

5.2.4 Enforcement of Defined Signal Status

If it's necessary to enforce a defined signal status, then the cable TZJB.1.R1 can be used for this purpose, which allows disconnection of input/output signal path. The required signal level can be then enforced on device/technology input by wiring yellow banana plug between the reference point and device input or green banana plug between the reference point and technology input. Parameters of input signals must follow recommendations of device/technology producer. Confusion of input and output of device/technology must be prevented when executing this measurement, because if signal would be enforced on device/technology output, this could lead to a permanent damage of device/technology. It has to be considered, that when wiring the cable TZJB.1.R1 to contact field, the respective signal path gets interrupted. Wiring spot of cable TZJB.1.R1 and reference point location on contact field is governed by valid wiring diagram for the given DRV type and applied accessories cables.

6 Maintenance and Repairs

The applied component base meets demanding criteria of reliability and durability. Device operation is maintenance-free. In case of a failure or damage of TZJ central unit it is necessary to send it to Producer for authorized service. If a cable is damaged, it is necessary to procure a spare part piece from Catalogue Sheet.