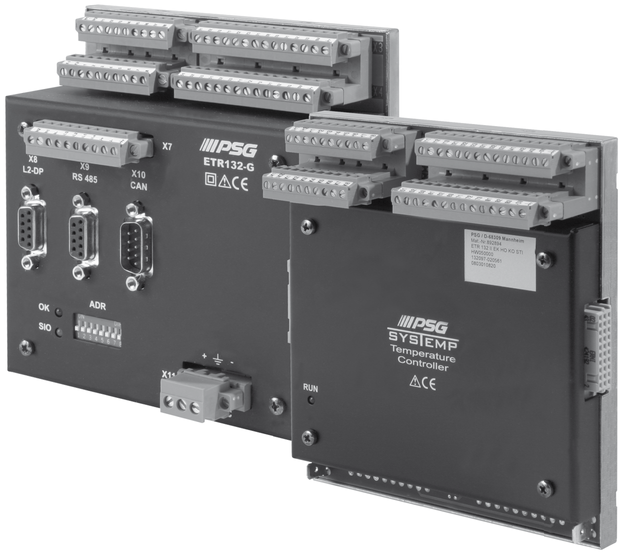
Multi Loop Controller sysTemp classic
ETR 132 II

Plastic Service Group



Features

- Effective, versatile multi zone temperature controller module for up to 32 3-point zones
- Application of
  - hot runners
  - plastics processing
  - packaging industry
  - furnaces and ovens
  - food processing
  - dryers, etc.
- Modular structure one base unit and up to three expansion units
- Per unit 8 measurement inputs, 16 control outputs and 24 measurement inputs (8x3 phase) for heating current monitoring
- Three alarm outputs and two digital inputs
- Software update feasible by interface
- Complete functional range for a large scope of application
- Precise and fast control algorithm
- All hot runner functions (start up mode, boost, manual mode, etc.)
- Automatic or manual temperature ramp function
- Group functions for e.g. heating-up processes in cascades
- Controller completely configurable by Windows engineering tool WinKonVis
- Interfaces:
  - RS485 and configuration interface RS232 concurrently usable
  - CANopen
  - Profibus-DP

Benefits

- Good price-performance ratio due to modular structure
- Flexibility through large array of functions
- Optimal product quality and low reject rates due to high control performance and intelligent zone monitoring
- Production reliability through close process monitoring
- Quick and easy system installation
- Expandability through numerous peripheral components
- Minimal configuration effort since the devices are already delivered in the user specific configuration

Function

- High resolution, digital signal processing on measuring inputs with short sampling rates
- Calculation of output signal by powerful micro processor unit
- Provision of output signal by intelligent pulse group distribution to control outputs
- For user imperceptible, fully automatic adaptation (identification phase) of controller of a zone during heating-up phase
- Automatic cooling adaptation
- Monitoring of zones (sensor, temperature, heating current, etc.) and alarm output by three configurable alarm outputs
- Heat current monitoring configurable - one transformer for each control zone or one transformer for multiple control zones
- Complex alarm - and monitoring functions (e.g. automatic or manual sensor monitoring of short circuit)
- Data communication by various interfaces
  - RS485[PSGII/MODBUS]
  - CANopen
  - Profibus-DP

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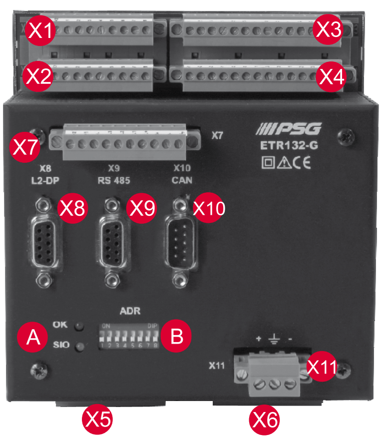
Technical Data

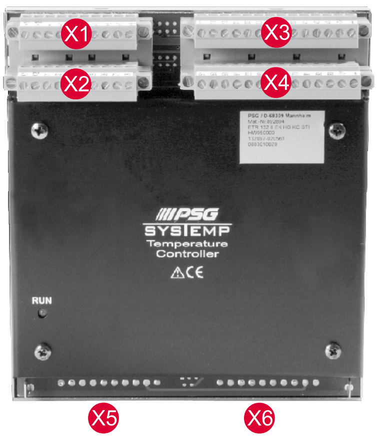
Measurement inputs	Number: 8 per unit Resolution: AD conversion with 14 Bit, resolution: temperature value 1/10 °C Thermocouple/Pt100 | d.c. voltage | D.C. Sampling cycle: 500 ms / input
Thermocouple	Type configurable L (-35 ... 500°C), J (-35 ... 500°C), K (-35 ... 900°C), TCPt/1300 Type K (-35 ... 1300°C) Temperature compensation included Sensor - and balancing cable respectively connect to controller Input resistance > 47 kOhm Accuracy of measurement: < 1K Control of sensor break, reversed polarity and short circuit
Resistance thermometer	Pt100 (-35 ... 450 °C) Connection: 3-wire without adjustment Connection: 2-wire, internal actual value correction or external terminating resistor Accuracy of measurement: < 1K Control of sensor break
Standard signal U	Measurement range 0...10 V, 2...10 V Display range adjustable 0...999 °C Input resistance > 10 kOhm Maximum tolerable input voltage <= 30 V Control of line-break (for measurement range 2...10 V)
Standard signal I	Measurement range 0...20 mA, 4...20 mA Display range adjustable 0...999 °C Input resistance 50 Ohm Control of line-break (for measurement range 4...20 mA)
Measurement input heating current monitoring	Three-phase per heating circuit; with external current transformer (please refer to accessories) Input voltage 42 mV_{EFF}/A Input resistance 20 kOhm
Digital inputs (only base unit)	Number: 2; configurable Optical coupler Maximum voltage 30 VDC Current demand approx. 12 mA
Alarm outputs	Number: 3; configurable Optical coupler Max. load 30VDC, 60mA Inductive load only with external free-wheeling diode switchable
Control outputs	Heating, Cooling Optical coupler Max. load 30VDC, 60mA Inductive load only with external free-wheeling diode switchable
Data interfaces (per base unit)	
V24 configuration interface / RS485	Galvanically isolated; RS232 for 230 V not galvanically isolated Transfer rate 1200/2400/4800/9600/19200 Baud Stop - and parity bit adjustable Protocol: MODBUS RTU / PSGII
RS485	2/4 wire
CAN	Connection of superior control system or intelligent local periphery Transfer rate (kBaud): 78.8 | 125 | 250 | 500 Max. tolerable bus length (m): 800 | 600 | 400 | 250 CANopen - DS401
Profibus-DP	Connection of control system with superior PLC or control EN 50170 V2
Electrical security	DIN EN 61010 (VDE 0411) Protection class II Degree of pollution 2 Over voltage category II
Power supply (only base unit see X11)	24 V; external fuse protection of device 4 A time lag. 230 VAC; external device fuse protection 2 A time lag.
Power consumption	Base unit: max. 25 VA on load; Expansion unit: ca. 2 VA
Max. allowed cable diameter for term.	1.5 mm^2; power supply X11: 2.5 mm^2
Ambient temperature limit	Operation: 0...60 °C, Transport, storage: -25...60 °C
Atmospheric humidity limit	Average relative atmospheric humidity < 75 % per year, no condensation
Mounting	Installation on DIN rail (DIN EN 50022) Maximal three expansion units (E) connectable to one base unit (G)
Dimensions (H x W x D in mm)	Base unit 140 x 125 x 75 | Order designation TPDK 155 x 125 x 75 Expansion unit 140 x 125 x 30 | Order designation TPDK 155 x 125 x 30

Housing	Metal housing
Weight	Base unit ca. 1.2 kg Expansion unit ca. 0.7 kg
Protection type	Housing and terminals: IP 20, D-SUB without PVC cover: IP 00 (X8, X9, X10)
CE marking	The device complies with the European Directives for electromagnetic compatibility and low voltages.
General	
LED displays	Status display, for function please refer to operating manual
Data backup	Data backup of all parameters in EEPROM (power failure save)
Software update	By interface serial | CAN

Connection overview



Base unit G



Expansion unit E

	Base unit G | Expansion unit E
X1	Control outputs heating 1...8 | n*8+1...n*8+8
X2	Control outputs Cooling 1...8 | n*8+1...n*8+8
X3/ X4	Heating current monit. 1...8 | n*8+1...n*8+8
X5	Measurement inputs 1...4 | n*8+1...n*8+4
X6	Measurement inputs 5...8 | n*8+5...n*8+8
X7	Alarm outputs 1...3, digital signal inputs 1...2
X8	L2-DP (interface Profibus-DP)
X9	RS485/V24 (serial interface)
X10	CAN (interface CAN)
X11	Power supply

A	Status LED's
B	DIP switch

Pin assignment

Notice: The terminal marking was modified. Here the new/old (identified by NEW/OLD) terminal marking is described.

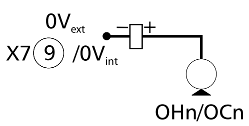
Note EMC
Due to EMC conventions signal and measurement lines have to be shielded! Shields have to be connected to the existing grounded terminals on the controller or the central grounded shield in the cabinet.
Note
For all terminals pin 1 is on the left hand (refer to view in terminal overview).

X1 control outputs Heating X2 control outputs Cooling

PIN	X1 NEW	X2 NEW
1	UH1)	UC1)
2	UH2))	UC2))
3	OH1	OC1
4	OH2	OC2
5	OH3	OC3
6	OH4	OC4
7	OH5	OC5
8	OH6	OC6
9	OH7	OC7
10	OH8	OC8

PIN	X1 OLD	X2 OLD
1	UH1)	UK1)
2	UH2))	UK2))
3	H1	K1
4	H2	K2
5	H3	K3
6	H4	K4
7	H5	K5
8	H6	K6
9	H7	K7
10	H8	K8

Note
) UH1/UC1 +12 V from X7/8 or U_{ext} or from auxiliary terminal UH2/UC2 from other module.
)) UH2/UC2 auxiliary terminal with the same electric potential like UH1/UC1 and can be used for the power supply of further outputs on other modules.



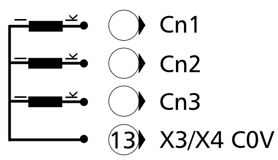
The specifications apply for all control outputs Heating/ Cooling.

X3 & X4 Heating Current Monitoring

PIN	X3 NEW	X4 NEW
1	C11	C51
2	C12	C52
3	C13	C53
4	C21	C61
5	C22	C62
6	C23	C63
7	C31	C71
8	C32	C72
9	C33	C73
10	C41	C81
11	C42	C82
12	C43	C83
13	C0V	C0V
14	⏚	⏚

PIN	X3 OLD	X4 OLD
1	I11	I51
2	I12	I52
3	I13	I53
4	I21	I61
5	I22	I62
6	I23	I63
7	I31	I71
8	I32	I72
9	I33	I73
10	I41	I81
11	I42	I82
12	I43 I-0V*	I83 I-0V*
13		
14	⏚	⏚

Note *
Do not connect C0V system overall! Do not ground C0V terminal externally!



Specifications apply for all measurement inputs.

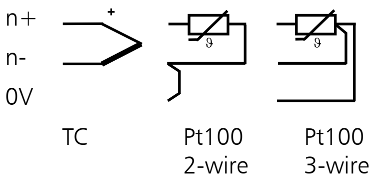
For the individual current measurement there exists a fixed assignment of measurement input and zone.
For a flex current measurement the assignment is adjustable.

X5 & X6 Measurement inputs

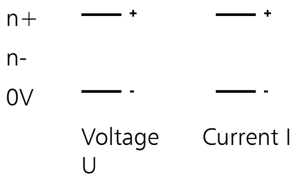
PIN	X5 NEW	X6 NEW
1	1+	5+
2	1-	5-
3	2+	6+
4	2-	6-
5	3+	7+
6	3-	7-
7	4+	8+
8	4-	8-
9	0V*	0V*
10	⏚	⏚

PIN	X5 OLD	X6 OLD
1	F1+	F5 +
2	F1-	F5 -
3	F2+	F6+
4	F2-	F6-
5	F3+	F7+
6	F3-	F7-
7	F4+	F8+
8	F4-	F8-
9	GND*	GND*
10	⏚	⏚

Thermocouple TC, resistance thermometer Pt100



Standard signal U [0/2...10 VDC], I [0/4...20 mA]



The specifications apply for all measurement inputs.

Note *
Do not connect 0V (GND) system overall! Do not ground 0V (GND) terminal externally!

X11 power supply

(only base unit)

	24 V	230 VAC
PIN	18...24 VAC 18...36 VDC	85...250 VAC
1	~ / +	N
2	⏚	⏚
3	~ / -	L

Fuse protection external
24 V : 4 A time lag
230 VAC : 2 A time lag

X7 Alarm outputs 1...3, digital signal inputs 1...2

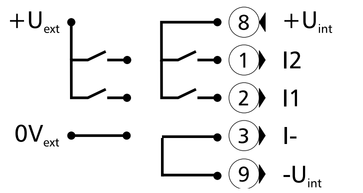
(only base unit)

PIN	X7 NEW	X7 OLD	Description
1	I2	IN2	Digital signal input 2
2	I1	IN1	Digital signal input 1
3	I-	IN-	Reference potential I *
4	AL3	AL3	Alarm Output 3
5	AL2	AL2	Alarm Output 2
6	AL1	AL1	Alarm output 1
7	AL+	AL+	Power supply alarm outputs
8	+U	+U	Auxiliary voltage +
9	-U	U-	Auxiliary voltage -
10	⏚	⏚	HF ground

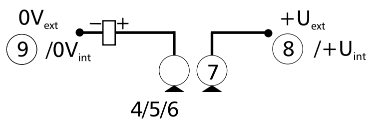
Auxiliary voltage +U/ -U

For controller with 18...36 VDC: 24VDC
Maximum output current: 1.5 A
Do not ground externally!

Digital signal inputs I1...I2



Alarm outputs AL1...AL3



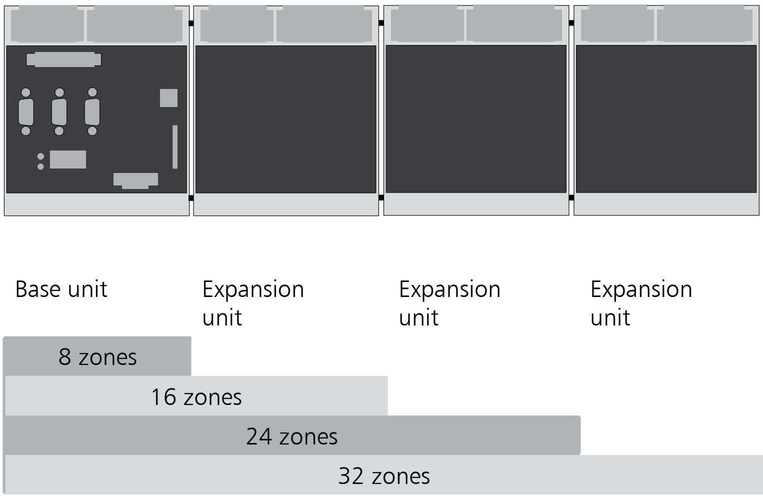
+U exclusively for control of SSR (consider load curve) as well as power supply for the operating and display unit.

X8 L2-DP (interface Profibus-DP)
X9 RS485/ V24 (serial interface)
X10 CAN (interface CAN)

PIN	X8	X9	X10 PSG-CAN	X10 CANopen
1		TxD-P	+U	
2		TxD-N		CAN-L
3	TxD-B	TxD-V24		
4	RTS			
5	0 V	RxD-N	GND	
6	+5 VDC	RxD-P		
7			CAN-L	CAN-H
8	TxD-A	RxD-V24		
9		GND-V24	CAN-H	

For assignment of X10-CAN-Bus refer to order information.

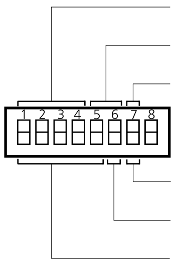
Application example



Configuration

Depending on the used firmware the DIP switch has different functions.

Firmware S



Addressing
CAN Baud Rate
Activation of default setting

Activation of default setting
Selection of addressing type
Addressing

Firmware SD

Firmware S	**Firmware SD**
Static Addressing	Static/Dynamic Addressing
Firmware Identifier	**Firmware Identifier**
08, 33, 37, 37...S, 48, 58, 68, 68...K, 92, 88	06, 32, 36, 46, 56, 66, 86

DIP 8 is without function.

Device ID/ Addressing (DIP 1...4 and/or 1...5) Addressing mode (DIP 6 Firmware SD)

The device ID is binary coded. The setting of the device ID is done by DIP switch 1...4 (Firmware S) and/or DIP switch 1...5 (Firmware SD) depending on the firmware.
Using firmware SD (DIP switch 6) it can additionally be chosen between static and dynamic addressing for the serial data interface.

Static Addressing of Serial Interface (Firmware version S and/or SD & DIP 6 = OFF)
At static addressing 8 zones are addressed by one address.
For the controller the zone number is defined by 32. The 32 zones therefore reserve 4 addresses.
The address of the controller is dependent on the DIP switch a multiple of 4.

Dynamic Addressing of Serial Interface (Firmware SD & DIP 6 = ON)
At dynamic addressing 8 zones are addressed by one address.
For the controller the number of the really existent modules (1 base unit [G], maximal 3 expansion units [E]) is relevant. On the basic unit the device ID is set. For the base unit as well as for the attached expansion units, 8 zones are addressed by one address. The DIP switch has to be set accordingly. Specify on the next base unit the **Device ID of the Previous Base Unit + Number of Expansion Units +1**.

The resulting address/NodeID is a combination of the interface depending base part and the device ID. The base part is configured, the device ID is set by DIP switch (1...4 and/or 1...5).

Interface	**Resulting Address/NodeID**		**Base part of Address/NodeID**		
Serial PSGII	Serial Address	=	See Static/Dynamic Addressing		
Serial Modbus RTU	Serial Address	=	See Static/Dynamic Addressing		
PSG-CAN	CAN Node ID	=	CANopen Base Address (CADR)	+	Device ID
Profibus-DP	Profibus DP slave address	=	Profibus DP Slave address (DPAD)	+	Device ID

For the setting of other interface parameters please refer to the operating instructions.

DIP 5...6 (Firmware S) baud rate CAN

For controllers with firmware S the baud rate for CAN is set by DIP switch 5...6. The system parameter CANB is without function.

DIP 5	DIP 6	Baud rate CAN
OFF	OFF	78.8 kBit (PSG)
ON	OFF	250 kBit
OFF	ON	500 kBit
ON	ON	125 kBit

For controllers with firmware SD the baud rate is set by system parameter CANB.

Standard setting

Serial interface (X9)

By the DIP switch 7 = ON, the default settings for the serial interface (X9) are activated:

- Address (see configuration device ID/ addressing, address mode)
- Protocol PSG II
- Baud rate 19200 Baud
- No parity
- 1 Stop bit

PSG-CAN interface (X10)

By the DIP switches 1...5 = ON, and DIP switch 7 = ON, the default settings for PSG-CAN (X10) are activated:

- CADR: CAN-Node-ID = 32
- CANB: Baud rate CAN = PSG
- A-OP: Auto-Operational mode ON

CANBus termination

Connecting Pin3 and Pin4 on terminal X10 activates the internal CANBus termination impedance of 120 Ohm.

Ordering designations

	Enter ordering designations		
G	Base module	**ETR132II G**	**ETR132 E**
E	Expansion module		
Module			
K	Screw terminal		
FZ	Spring terminal		
F	Ribbon cable		
DK	Double deck terminal (only X5, X6)		
DFZ	Double deck spring-force terminal (only X5, X6)		
Control output			
HO	Heating		
-	Not existing		
Control output			
KO	Cooling		
-	Not existing		
Input			
TCPt	Thermocouple / Pt100		
TCPt/1300	Thermocouple up to 1300 °C		
U	Standard signal U (0/2...10V)		
I	Standard signal I (0/4...20mA)		
-	Not existing		
Heating current recording			
STI	Heating current recording		
-	Not existing		
Data interface 2			
CAN	CAN-Bus with PSG-CAN pin assignment		n.a.
CANopen	CAN-Bus with CANopen conform pin assignment		
-	Not existing		
Data interface 3			
Profi	Profibus-DP		n.a.
-	Not existing		
Voltage			n.a.
24 V	AC/DC		
230 VAC	AC		

Data interface 1 RS485/V24 is always existing as standard

Scope of supply

CD-ROM with documentation and software

Accessories

For details of the large range of accessories please refer to the data sheet control systems system SYSTEMP® system description SYSTEMP® bus.