

ISKUSTVA UGRADNJE DVOSTRUKIH RASTAVNIH SKLOPKI U SKLOPU PROJEKTA NAPREDNIH MREŽA

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SADRŽAJ IZLAGANJA

1. Uvod

2. Konfiguriranje zaštitno-upravljačkih terminala

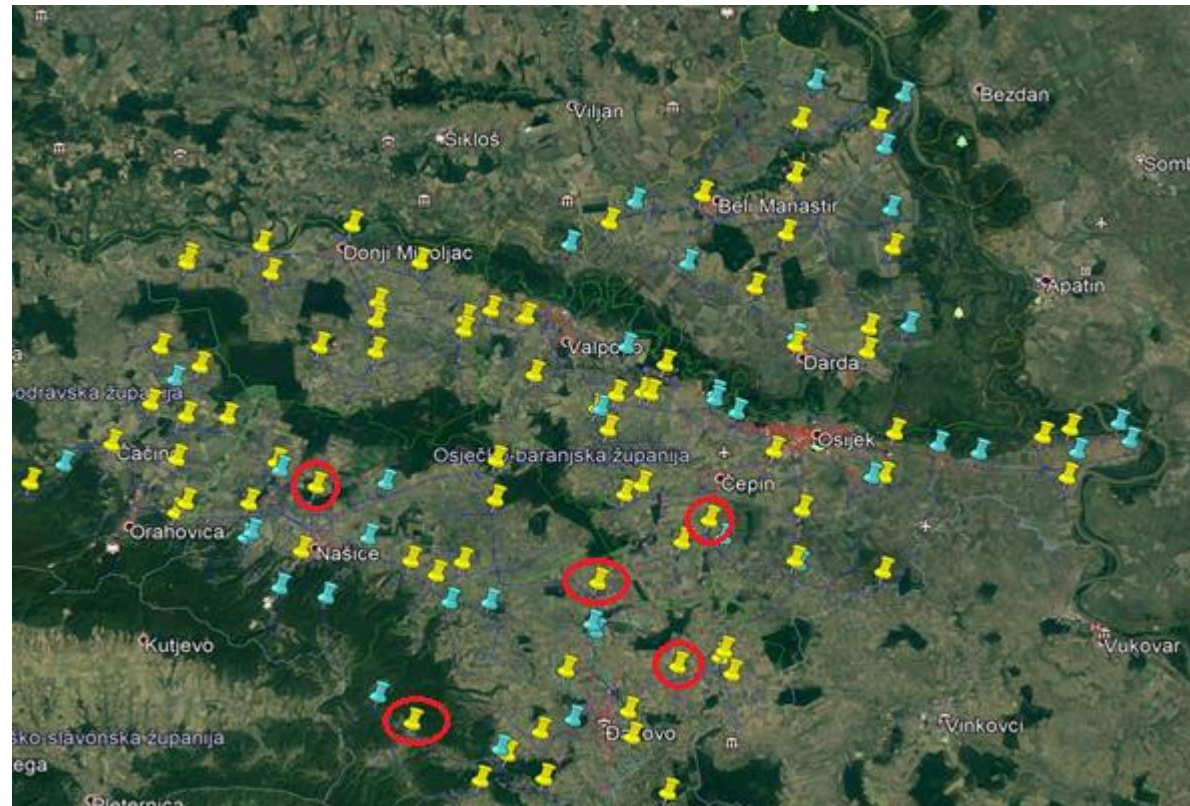
3. Konfiguriranje SDV-a

1. Uvod

- Projektna aktivnost 3 - automatizacija srednjonaponske mreže - ugradnja SF6 sloпки i upravljivih sklopniہ blokova

DP	SF6 SKLOPKE			SN BLOKOVI				UKUPNO LOKACIJA
	JEDNOSTRUKI	DVOSTRUKI	UKUPNO	2VT	3VT	4VT	UKUPNO	
Elektra Zagreb (4001)	98	45	143	11	35	2	48	191
Elektroslavonija Osijek (4008)	73	5	78		15	10	25	103
Elektrodalmacija Split (4013)	131	40	171	20	34	3	57	228
Elektra Zadar (4014)	5	65	70	3	16	4	23	93
Elektrojug Dubrovni (4016)	35	6	41	3	7	4	14	55
UKUPNO	342	161	503	37	107	23	167	670

- Lokacije ugradnje
- Plavo – postojeći
- Žuto – planirani
- Crveno – dvostruki
DURN-ovi



- Cilj ugradnje DURNova – automatizacija mreže
- Montaža – vrsta stupa i sile opterećenja

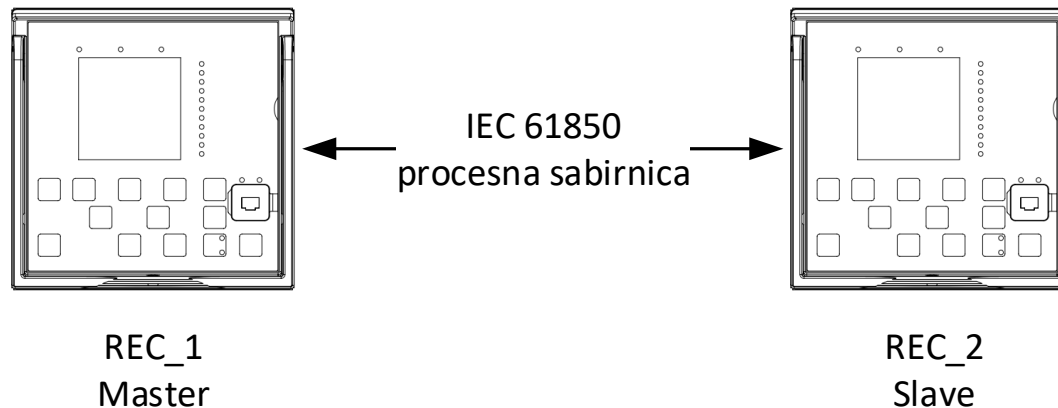


2. Konfiguriranje upravljačko-zaštitnih terminala

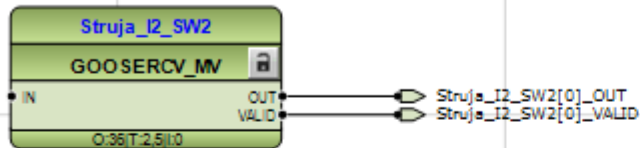
- Ispitivanje ožičenja ormara
- kreiranje konfiguracije
- razmjena informacija između dva uređaja – horizontalna komunikacija



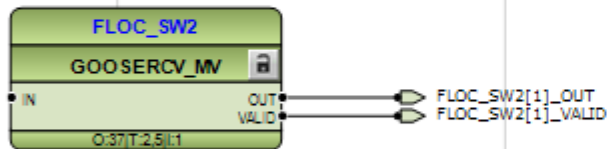
- Standard IEC 61850
- GOOSE poruke
- razmjena mjerenja, signalizacije, upravljanja i alarma



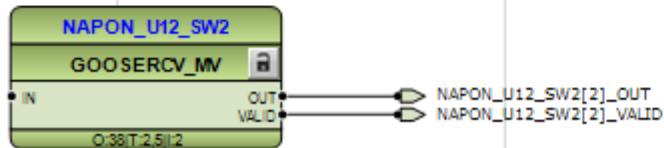
GOOSE Current I2 from SW2



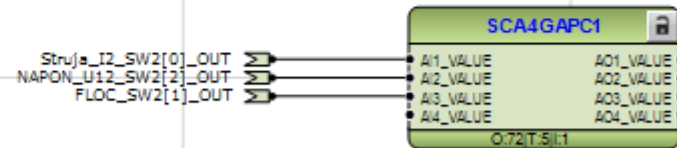
GOOSE Fault location from SW2

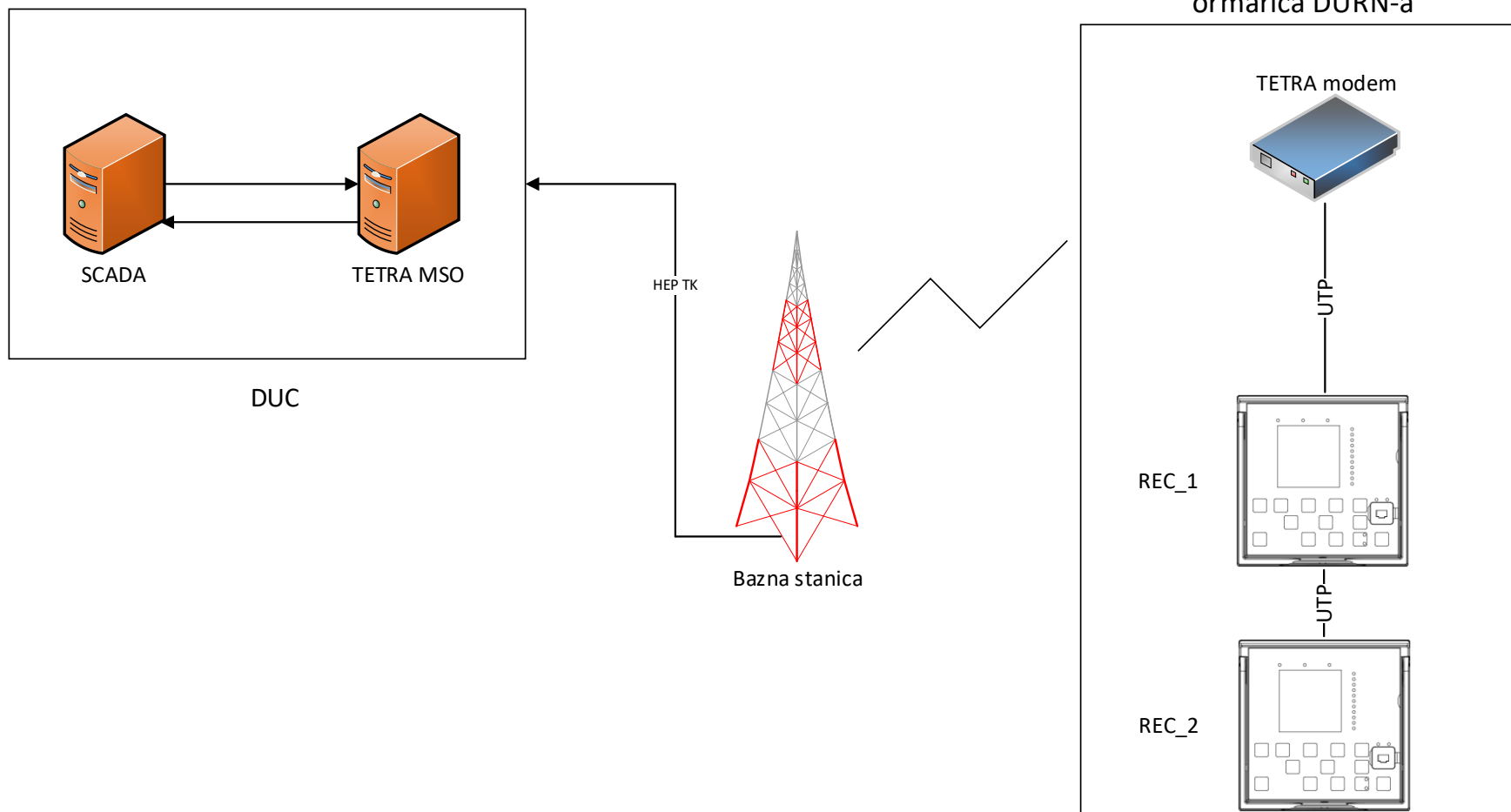


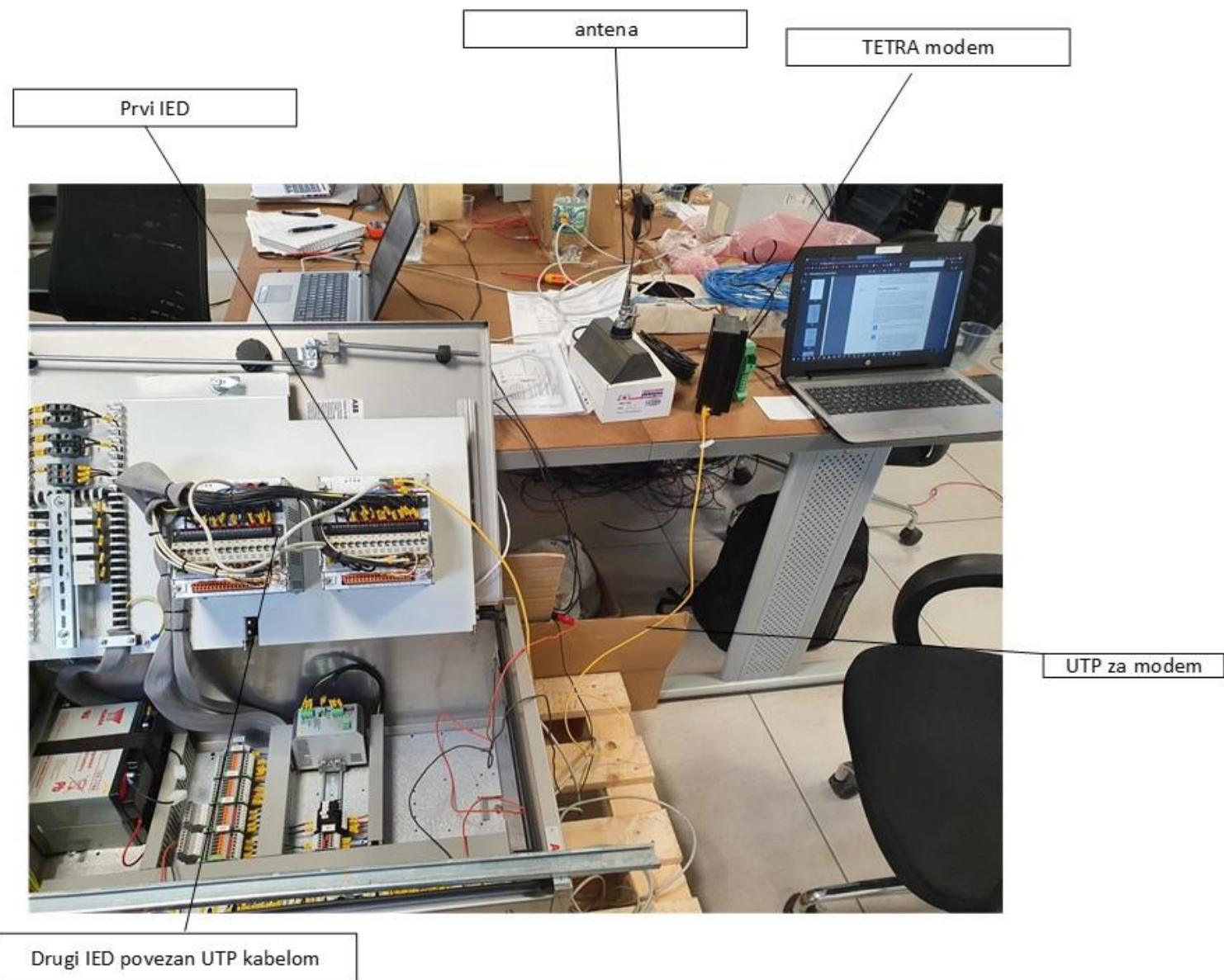
GOOSE Voltage U12 from SW2



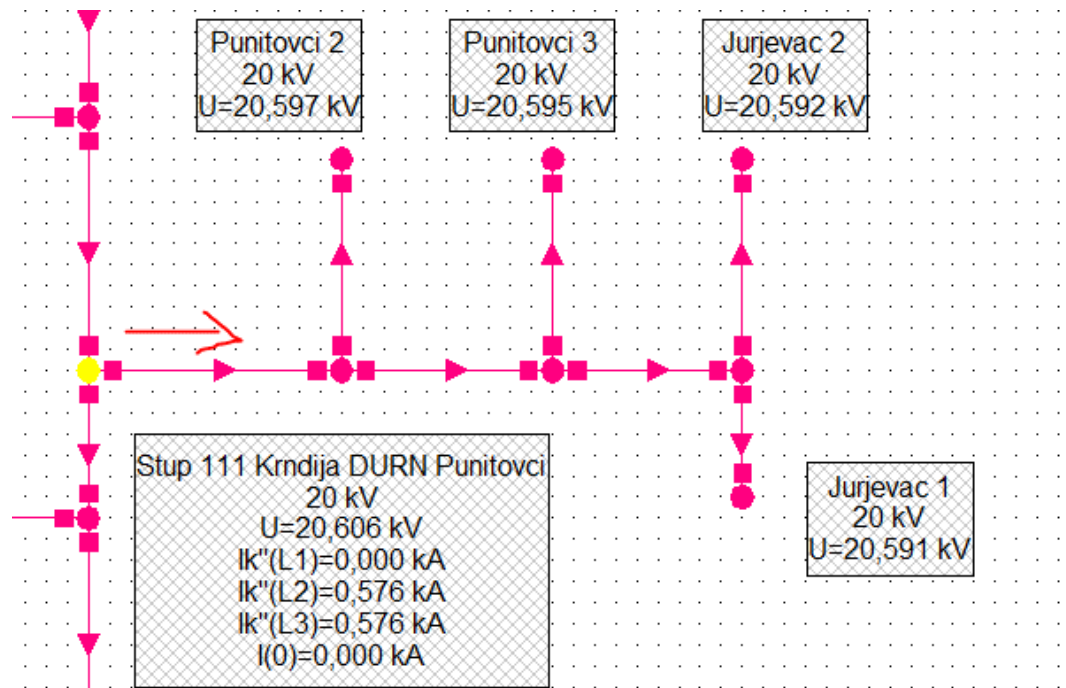
Measurement for SCADA

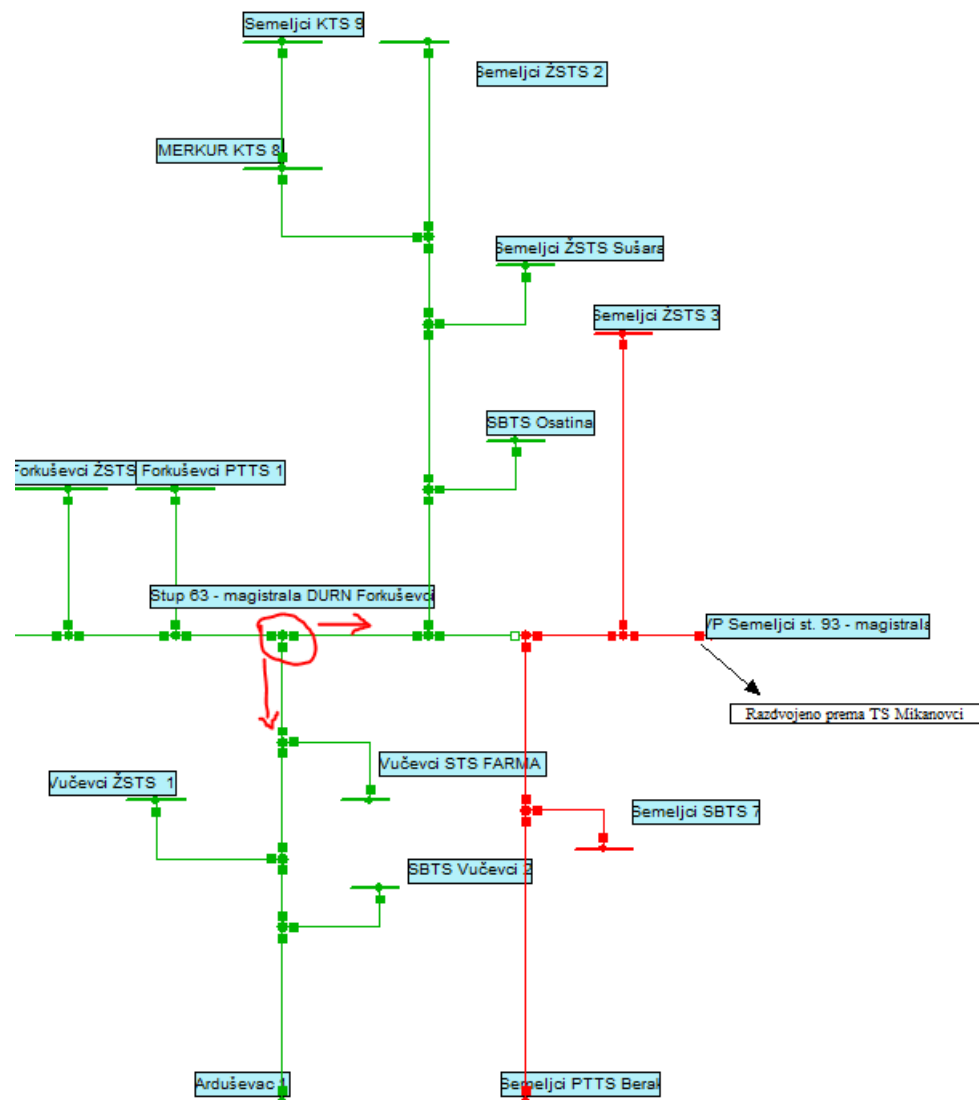




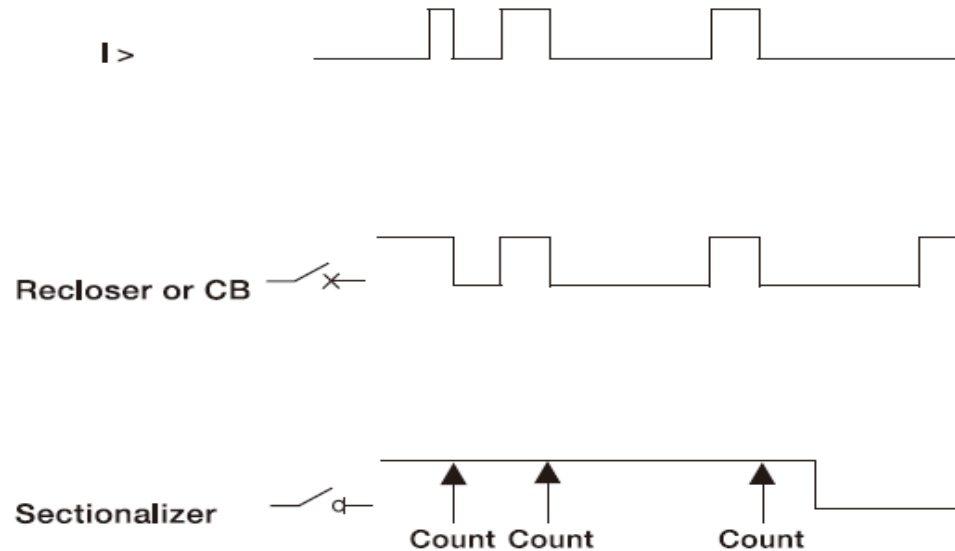


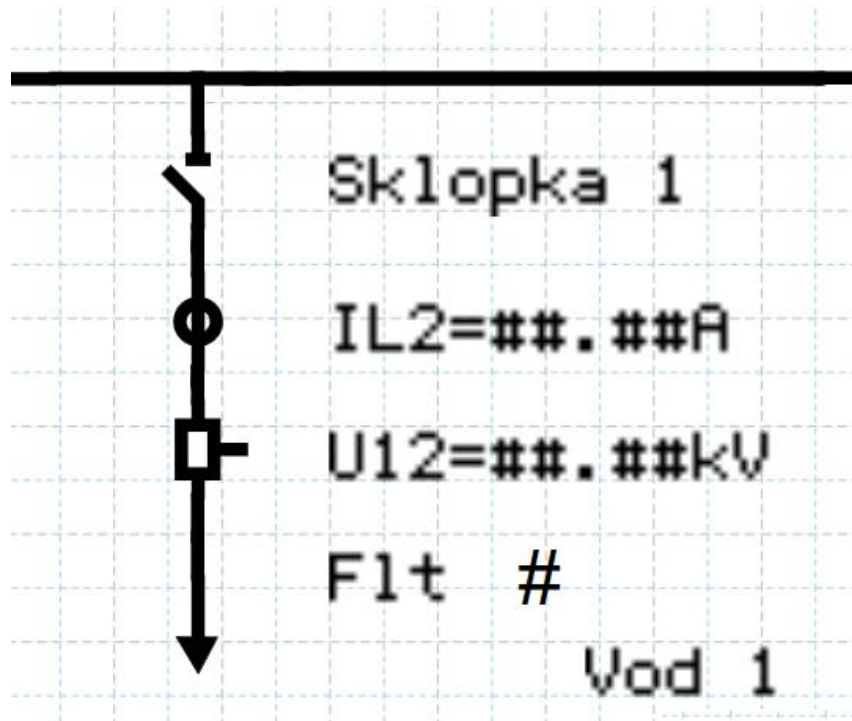
- Detekcija kvara u mreži
- NEPLAN model mreže korišten za proračun struja KS-a i kapacitivnih doprinosa iza mjesta ugradnje
- Za lokator kvara je također korišten NEPLAN





- 80-90% kvarova na SN-u prolazno i kratkotrajno
- Automatsko odvajanje nakon detekcije kvara (ovisno o broju pokušaja APU-a) - sectionalizer





IL1=##.##A

IL2=##.##A

IL3=##.##A

Io=##.##A

U12=##.##kV =##.##kV

U23=##.##kV =##.##kV

U31=##.##kV =##.##kV

ang IL1=##.##

ang IL2=##.##

ang IL3=##.##

ang U1=##.##

ang U2=##.##

ang U3=##.##



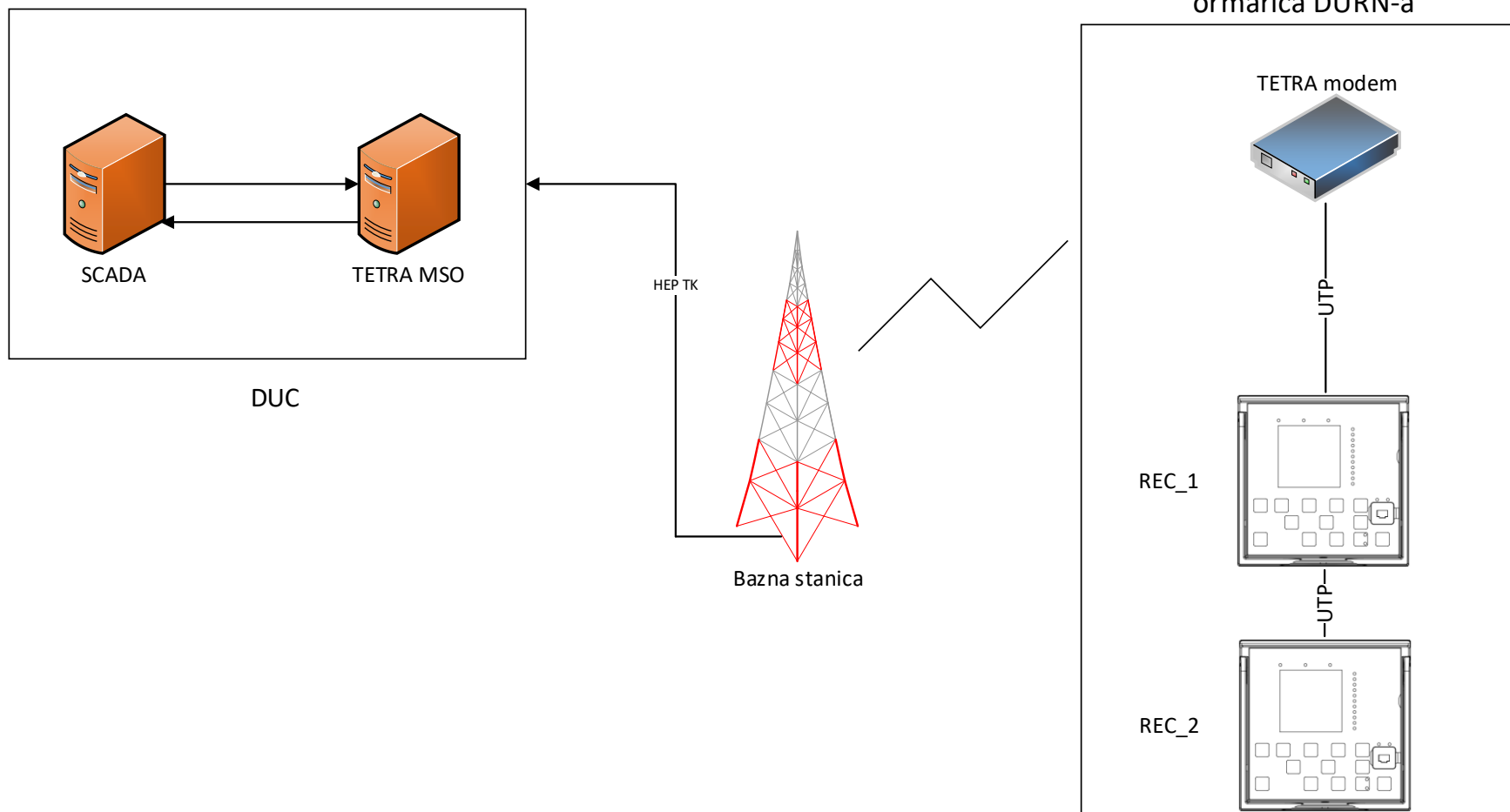




3. Konfiguriranje SDV-a

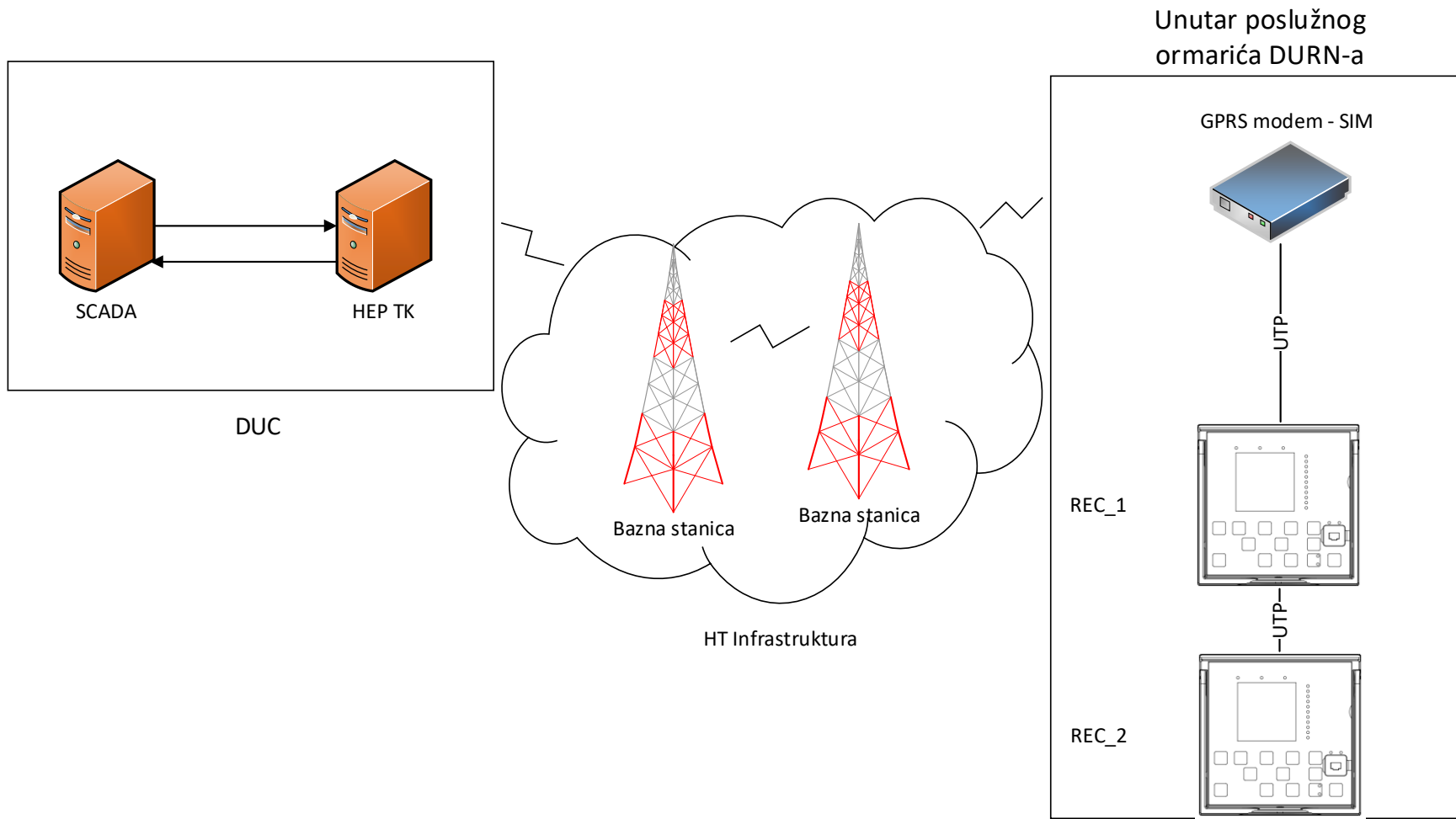
- IEC 60870-5-101/104
- TETRA IP – Packet data
- TETRA modem
- 380 – 430 MHz
- RF output power 10W





- GPRS modem
- 4 Ethernet ports: LAN, WAN/LAN
- RS232
- 1× DI, 1× DO
- USB host
- Micro SIM





Object Types ▾ ×

General

Generic IEC6185...

Feeder Automatic...

Project Explorer

Plant Structure

- Measurements
- Disturbance records
- Configuration
- Control
- System
- Communication
 - Ethernet
 - Communication: 0
 - SCHLCCH1: 1
 - SCHLCCH2: 2
 - SCHLCCH3: 3
 - RCHLCCH1: 1
 - IEC60870-5-101/104
 - MMSLPRT1: 1
- Trip logic
- Condition monitoring
- Disturbance recorder: 0
- Measurements
 - HMI: 0
- Fault record
- Time: 0
- Generic timers
- Authorization: 1
- Generic logic
- General: 0
- Setting group: 0
- Analog inputs
- Control: 0
- I/O modules: 0
- Function keys
- Programmable LEDs: 1
- Monitoring
 - Information
 - Clear

REC615_1 - Parameter Setting

Group / Parameter Name	IED Value	PC Value	Unit	Min	Max
Communication: 0					
Communication					
Rear port(s)					
IP address		192.168.2.10			
Subnet mask		255.255.255.0			
Default gateway		192.168.2.1			
Mac address		00-21-C1-53-CA-9D			18 characters
Front port					
IP address		192.168.0.254			
Mac address		00-21-C1-53-CA-9C			18 characters

Object Types ▾ ×

General

Generic IEC6185...

Feeder Automatic...

Project Explorer

Plant Structure

- Measurements
- Disturbance records
- Configuration
- Control
- System
- Communication
 - Ethernet
 - Communication: 0
 - SCHLCCH1: 1
 - SCHLCCH2: 2
 - SCHLCCH3: 3
 - RCHLCCH1: 1
 - IEC60870-5-101/104
 - MMSLPRT1: 1
- Trip logic
- Condition monitoring
- Disturbance recorder: 0
- Measurements
 - HMI: 0
- Fault record
- Time: 0
- Generic timers
- Authorization: 1
- Generic logic
- General: 0
- Setting group: 0
- Analog inputs
- Control: 0
- I/O modules: 0
- Function keys
- Programmable LEDs: 1
- Monitoring
 - Information
 - Clear

REC615_1 - Parameter Setting

Group / Parameter Name	IED Value	PC Value	Unit	Min	Max
TCP Port		2404		0	65535
Device Address		264		1	65535
ASDU Address		264		1	65535
Link Mode		Balanced			
COT Length		2		1	2
IOA Length		3		1	3
Link Address Length		2		1	2
ASDU Address Length		2		1	2
Single Char Resp		False			
Show Bad Time		True			
Time Format		Full 56bit			
Event Time		UTC			
Overflow Mode		Oldest+indication			
OVInd IOA		60000		0	16777215
OVInd NoGI IOA		60000		0	16777215
Selection Timeout		30	s	1	65
Counter Reporting		Read by master			
Freeze mode		Not in use			
TX window (k)		12		1	20
RX window (w)		8		1	20
TX timeout (t1)		40000	ms	1	60000
RX timeout (t2)		10000	ms	1	60000
Test interval (t3)		60000	ms	1	60000
Cyclical Period		10		1	604800

TOMAŠANCI



GORJANI



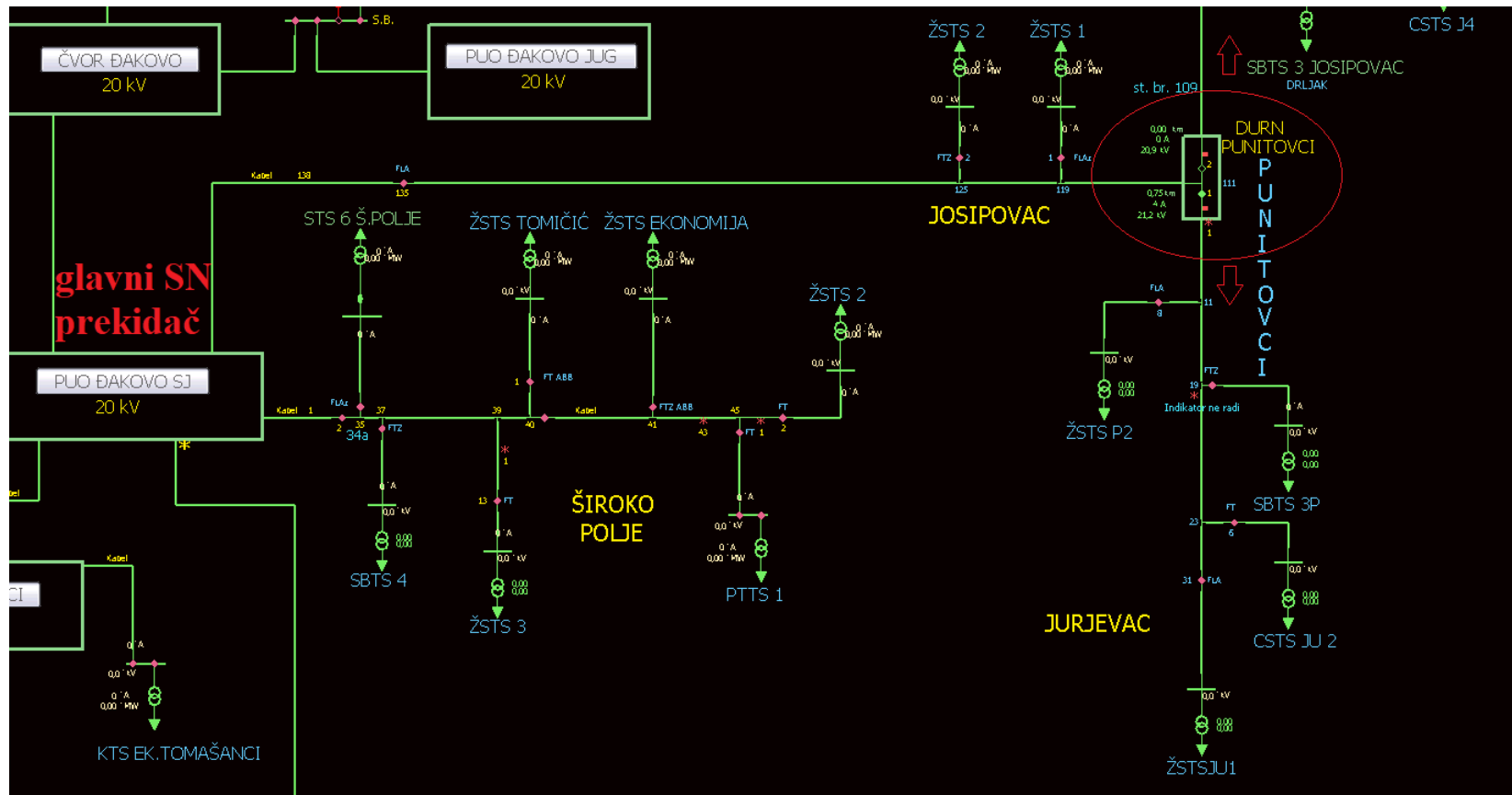
PUNITOVCI



FORKUŠEVCI LEVANJSKA



	PUNITOVCI	FORKUŠEVCI	LEVANJSKA
ISPAD DC AUT UPRAVLJANJA 1	☒	☒	☒
ISPAD DC AUT UPRAVLJANJA 2	☒	☒	☒
NADNAPONSKA ZAŠTITA VOD 1 UPOZORENJE	☒	☒	☒
NADNAPONSKA ZAŠTITA VOD 2 UPOZORENJE	☒	☒	☒
NADSTRUJNA ZAŠTITA VOD 1 UPOZORENJE	☒	☒	☒
NADSTRUJNA ZAŠTITA VOD 2 UPOZORENJE	☒	☒	☒
ZEMLJOSPOJNA ZAŠTITA VOD 1 UPOZORENJE	☒	☒	☒
ZEMLJOSPOJNA ZAŠTITA VOD 2 UPOZORENJE	☒	☒	☒
NESTANAK AC NAPONA	☒	☒	☒
TLAK PLINA SF6 NIZAK	☒	☒	☒
NAPON BATERIJE NIZAK	☒	☒	☒
KVAR GOOSE KOMUNIKACIJE	☒	☒	☒
VRATA ORMARIĆA - OTVORENA	☒	☒	☒



Zaključak

- Mogućnost daljinskog preklapanja mreže
- IEC 61850 standard kreira lokalnu mrežu
- Lokator kvara od velike pomoći dežurnim ekipama
- Automatsko odvajanje uspješno ispitano u pogonu
- GPRS tehnologija prvi puta u DP ESO za SDV
- Testiran rad TETRA mreže na teško dostupnim lokacijama

Hvala na pažnji!