

MBSM

with phase control

Field Installation procedure



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SUMMARY

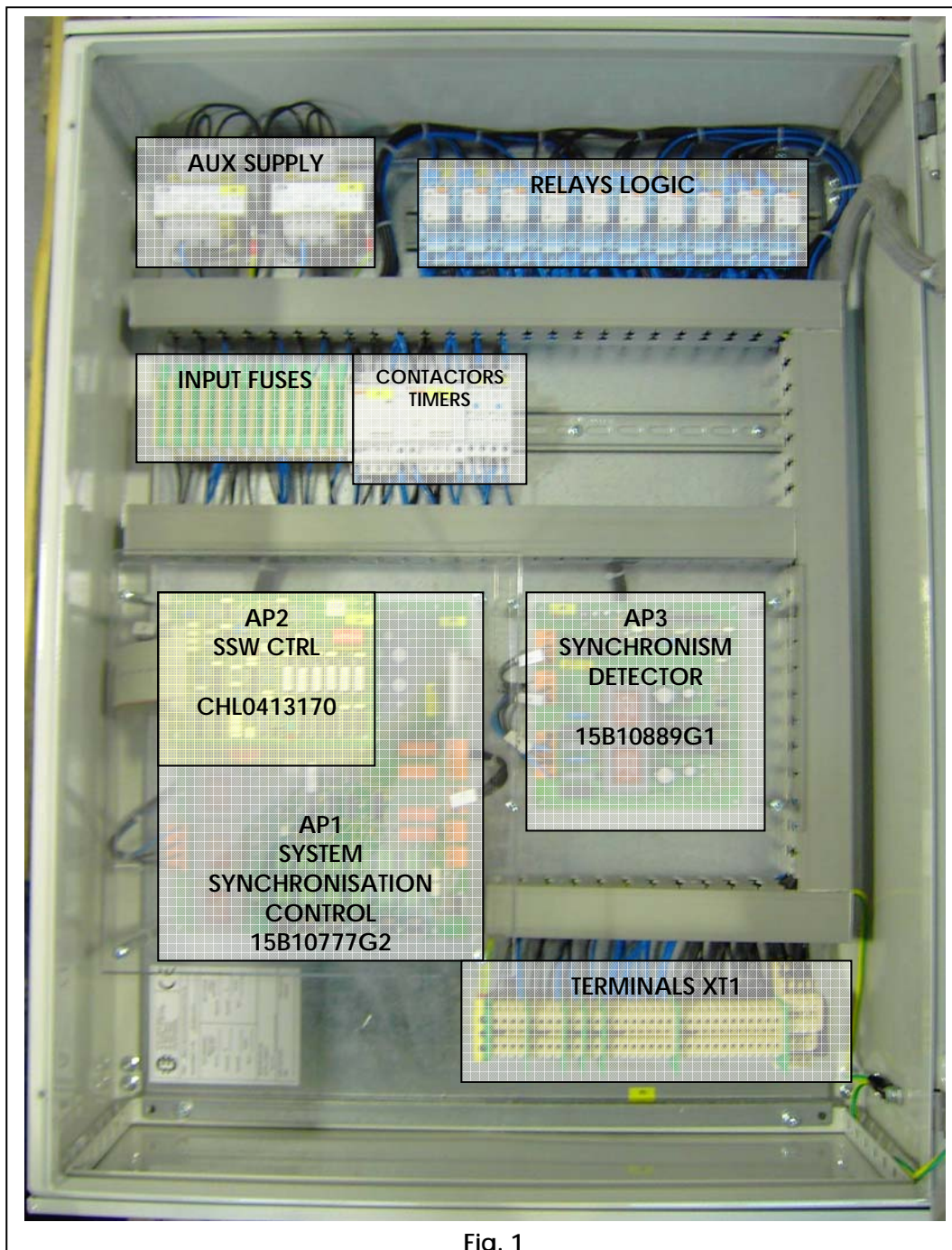
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1 Introduction

The MBSM with phase control (10B14545G1) has been designed for dual bus UPS systems (also known as N+N systems). The reference UPS model is ONLY the Chloride 90NET series and this document is therefore related to this UPS model ONLY.

For any application, with different UPS model this document is not valid.

2 MBSM internal layout



3 UPS set up

Each UPS composing the system A and the system B, must be set via PPvis according with the following points.

3.1 MBSM function activation

Verify that the parameter P579 is set to 1 (external synchronisation enabled). This setting should have been done in factory already.

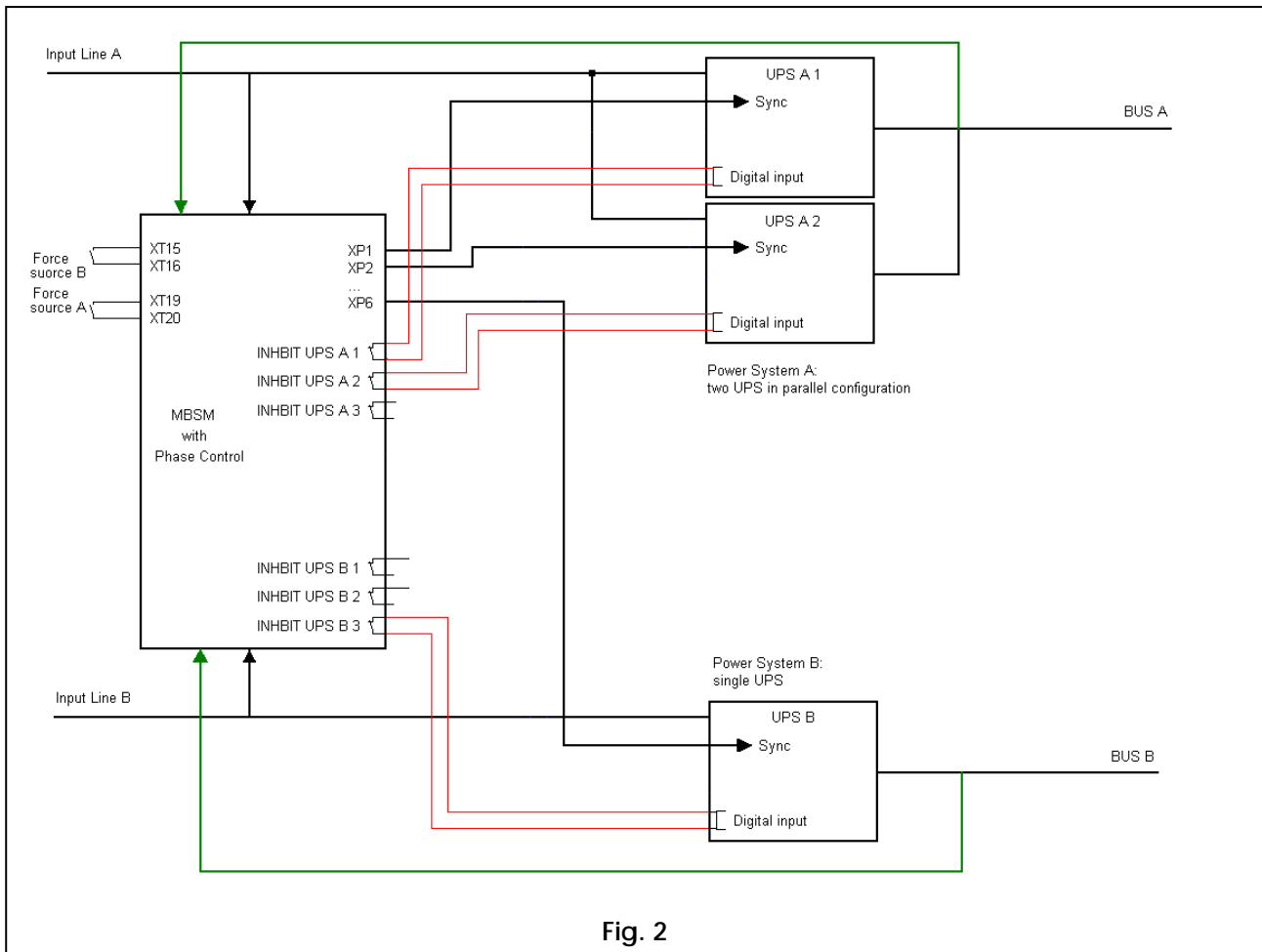
If the MBSM installation is going to be done on a UPS system already in service and the synchronisation functionality was not present before, the only activation of the parameter P579 is **NOT** sufficient. The detailed procedure is available in appendix A.

3.2 Generator function activation (CU input EK1)

Verify that the generator function on the input EK1 has been activated on all the UPSs. The function must be active as per following instruction:

P93	= 1	(Standby generator operation)
P94	= 0	(Default setting)
P123	= 5	(Charging and bypass enabled, inverter synchronisation disabled when SGS is in operation)

4 MBSM interconnections



The above Fig.2 is an example of a dual Bus system composed by a modular parallel on the bus A and from a single unit on the bus B.

4.1 Power interconnections

The MBSM is powered by the two main buses and from the two critical buses (UPS outputs)

Main BUS A is a three phase +N line to be interconnected to the MBSM XT1 terminals 1[a], 2[b], 3[c] and 4 [N]. The phase sequence MUST be the same of the UPS A reserve input.

Suggested wires size 1.5~2.5 mm², protected with 10A gGgL fuses or 10A C curve circuit breaker.

Main BUS B is a three phase +N line to be interconnected to the MBSM XT1 terminals 5[a], 6[b], 7[c] and 8 [N]. The phase sequence **MUST** be the same of the UPS B reserve input.

Suggested wires size 1.5~2.5 mm², protected with 10A gGgL fuses or 10A C curve circuit breaker.

AUX supply A is a single phase line coming from the UPS A output, to be interconnected to the MBSM XT1 terminals 9[L] 10[N].

Suggested wires size 1.5~2.5 mm², protected with 10A gGgL fuses or 10A C curve circuit breaker.

AUX supply B is a single phase line coming from the UPS B output, to be interconnected to the MBSM XT1 terminals 11[L] 12[N].

Suggested wires size 1.5~2.5 mm², protected with 10A gGgL fuses or 10A C curve circuit breaker.

4.2 Signals interconnections

UPS inhibition signals are contacts present in the MBSM to be wired to each EK1 input of each UPS installed.

BUS A UPS EK1 must be wired to the MBSM outputs XT1 from 21 to 26.

BUS B UPS EK1 must be wired to the MBSM outputs XT1 from 27 to 32.

See also Fig.2 red signal interconnections.

Suggested wires size 1.0~1.5 mm².

Frequency reference signals are signals available on the MBSM RJ45 plugs XP1~ XP6. Each UPS is equipped with and RJ45 on the control PCB.

Each UPS RJ45 must be interconnected to an RJ45 XPx plug on the MBSM.

For this interconnection use only shielded RJ45 cables and, possibly, do not run these cables in the same conduit where the power cables are running.

The max theoretical length of each frequency reference cable shall not exceed 100m.

4.3 Remote contacts

Two remote contacts are available for the customer use :

BUS A forced = XT1 19-20

BUS B forced = XT1 15-16

If these remote contacts/commands are not used, leave the mentioned terminals **NOT** wired. Once these inputs are open, the MBSM will logically behave normally.

5 APPENDIX A

To enable the synchronisation option the P579 has to be set to 1 and the P75. 21 to 24 has to be configured as follow:

PNU 579 – External Synchronisation enable		
Range	Meaning	Description
0 (def)	No synchronisation with external system	The synchronisation with an external synchronisation signal is disabled.
1	Synchronisation with external system enabled	The synchronisation with an external synchronisation signal in case of bypass (reserve) mains failure or SGS operation is enabled (corresponding parametrization of PNU 123 Backup generator provided).

PNU 75 – Power Rating Class		
PNU	Meaning	Value
75.21	OFFSET = X_UR2_CRE	Offset compensation [0 = 0° - 0x10000 = 360°]
75.22	EXT_SYN_F_LIM = X_UR3_UV	1024
75.23	EXT_SYN_PHI_LIM = X_UR3_IV	1024
75.25	DELTA_F_GAIN = X_UR3_CRE	4096

5.1 P75.21 Offset compensation tuning

The parameter P 75.21 has been designed to compensate the phase error, introduced by the UPS control, between the frequency reference coming from the MBSM and the inverter output signal. The value to be inserted to compensate the error is calculated applying one of the following formula:

Hex input : $P75.21 \text{ [Hex]} = \text{phase-error } [^\circ] * 0x10000 / 360$
(0x10000 is 10000 in Hex format.)

Decimal input: $P75.21 \text{ [Dec]} = \text{phase-error } [^\circ] * 65536 / 360$

To carry out this procedure an oscilloscope between reserve input and inverter output has to be used. The MBSM must be already installed and interconnected to the UPS system. The P579 must be already loaded and set to 1.

The P75.21 calibration must be done on each UPS composing the system.

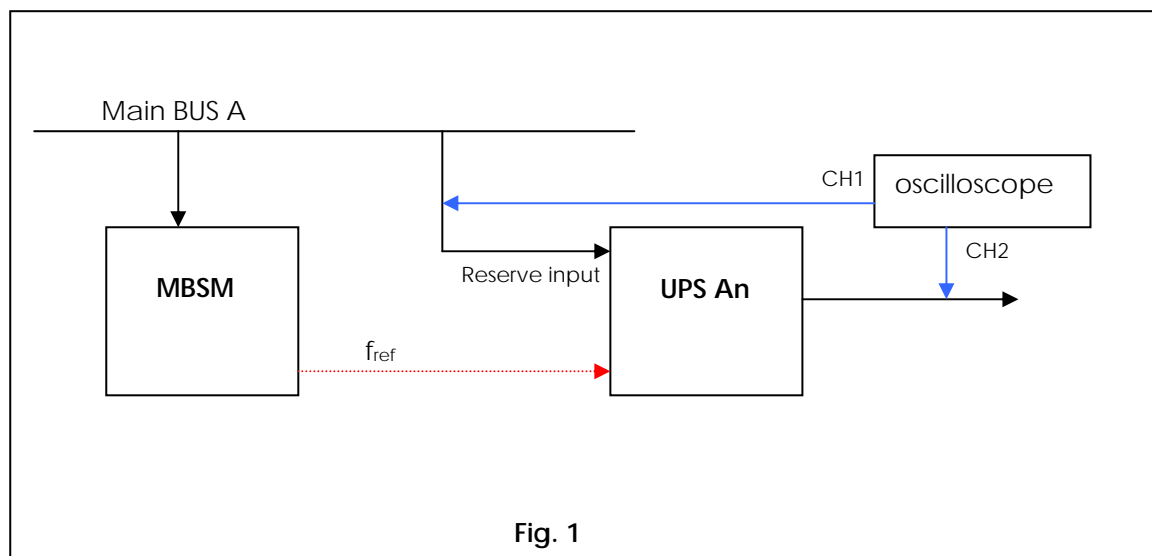


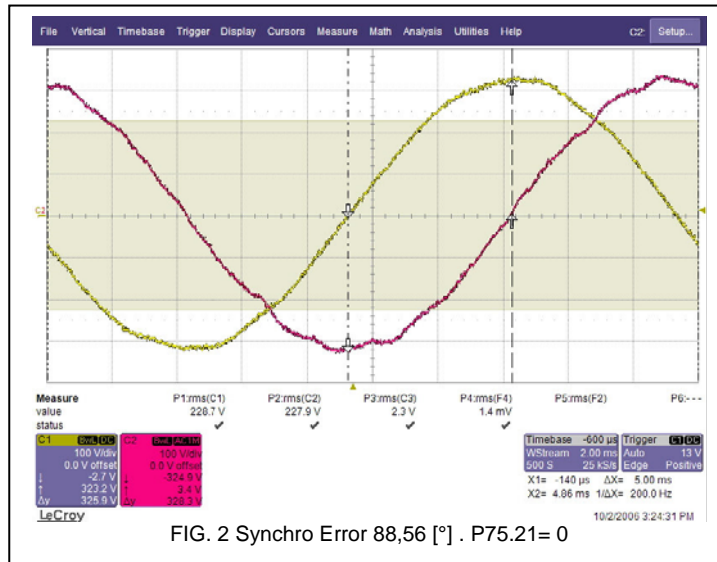
Fig. 1

Figure 1 is the layout the example for calibrating the P75.21 on UPS An:

- The MBSM priority switch must be in A BUS priority

Start the inverter, wait load on inverter than and open the reserve input switch QS2.
Verify the phase error between inverter and bypass.

P75.21= 0 _ Offset compensation [0 = 0° - 0x10000 = 360°] (see Figure 2)



Decimal input: P75.21[Dec] = phase-error [°] * 65536 / 360

Decimal input: P75.21[Dec] = 4,92/20 * 360 * 65536 / 360

Decimal input: P75.21[Dec] = 88,56 [°] * 65536 / 360 = **16121** (see Figure 3)

Load the calculated value and repeat the test to verify the result.

