Review on the FLUKE 381 REMOTE DISPLAY TRMS CLAMP METER (VERSION 1) 14.12.2012

There must be something mysterious about the 381, or maybe its intended purpose is so specific that there are only very few owners of the 381. So far, I have only found one review on YouTube by Martin Lorton.

This review will go a little bit further into details and will contain the following:

- Exterior, design, functionality list of equipment it comes with.
- Walkthrough through all obvious functions,
- accuracy tests, respond and update rates of the measurements taken,
- Observed pros and cons while using the meter in the field.
- Conclusion

Unpacking the device

The clamp meter comes in a FLUKE bag, including the 381 itself, the I-Flex Current Probe, two test leads including multipurpose cables and two alligator clips as seen on the picture. Manuals are also included.

Exterior design

The 381 is a massive device, at first sight it makes a very robust and well made impression. The yellow surrounding is a kind of plastic / rubber compound but it is not as flexible as the well known yellow Fluke protective covers for their multimeters like they use on the 28 II for example. You cannot remove the yellow plastic housing on the 381 like you can do on a 28 II. The grey plastic housing seems to be the same plastic material, like they use on their multimeters. Only the selector switch in the same grey color is a kind of rubber / plastic compound to get better Grip on it.

When I first switched the clamp meter on, I noticed that the knob jiggles forth and backward, about 1mm. It is not loose but since I products like in their multimeters, I am really disappointed in what they have done here. At least the red clamp itself make a firm and stable impression, there is no jiggling observable. At the backside of the meter is the battery cover, with a turn able knob to open it. It turns very light in any direction, there is no block,

you can turn the cover knob as long as you want. The only indicator, whether the cover is open or closed are the symbols of the knob itself. I think that's a really crappy design it opens way too easy and practically gives you no physical feedback, whether the battery lash is now open or closed.

The remote display, certainly a big selling point for this meter, can be taken off the meter by pulling the side

The Display and its magnetic holder:

The Display is supposed to stick to any magnetic surface, such steel, due to its two (2) magnets on the backside of the display. As a matter of fact it does, but again it does not do it well. Testing the clamp meter in the field turned out, that sometimes you don't have even metal surfaces big enough to reach both magnets. There are more like steel tubes or metal frames of your switchboard or maybe you have a metal rail somewhere near you that are only big enough to reach one magnet. Now in order to make the magnetic display stick where you want to strong and firmly, both magnets at the backside MUST touch an even surface. (**Fig b**) Otherwise it won't stick at all and you run into danger, that the display will fall on the ground. So you can't stick it on Tubes, or smaller metal lashes (**Fig c and a**), etc.

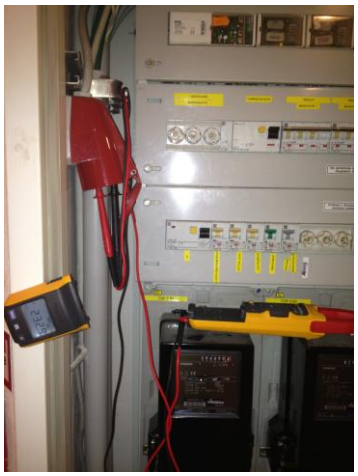

Fig a

Fig b

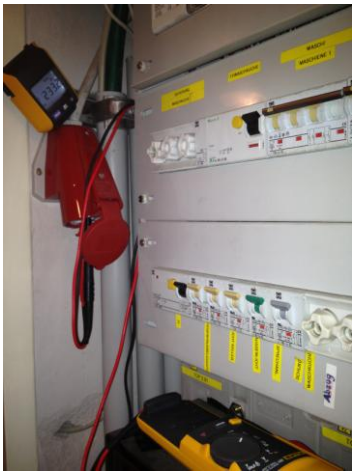

Fig c

The LCD and its Backlight

When the backlight is turned off, the contrast and the maximum angle where you can still read the digits on the display is quite good even at wide angle the digits remain readable (**Fig f**). But as soon as you turn on the backlight (there is only on mode, I ask myself why only one?!) you can't read shit, as soon as you slightly view from the side or above (**Fig d**) or can't read anything like in (**fig e**) (compares same angle like in (**fig f**).

Fig d **Fig e** **Fig f**

Functions:

Measuring VAC and VDC:

Obviously you can only measure Volts by using the test leads or any other cable that will fit into standard 4mm banana connectors. Its update rate is very fast, no over or undershooting at all. The only thing I am really missing is a second decimal place for lower voltage range. The clamp meter would turn out to be a perfect multipurpose meter even for electronic stuff if you would have some higher resolution in a VDC range of … lets say from 0 to 100 Volts.

Measuring resistance and continuity:

Continuity: as already seen on martins video blog the continuity tester is quite slow but the worst thing is, if you scratch the probe tips the beep is not clean but scratchy. This brings me right to the next point. This clamp meter is supposed to work in the field, maybe in some loud environment with big, bad and loud electric motors running in the background…: the beep is so ridiculous quiet… I really don't know what Fluke had in mind when they decided to put that tiny beeper in there, but after all it is a big piece of crap.

Another thing: I can't choose measuring resistance or continuity. Its on function on the Meter, meaning: if I measure resistance less than 30 Ohms the damn thing bleeps and bleeeeeps and bleeeeeeps (thankfully not too loud though!!) and the maximum range is 100k Ohm, every measurement exceeding will show you an overload, even the 117 electrical multimeter from Fluke has a higher range. What the hell? And besides of all that, I am really missing a diode test function on this thing!!

Measuring Amps AC and Frequency:

Let's start off with **frequency**: You can ONLY measure frequency by using the clamp (Probes and test leads won't work!!) AND, you can ONLY measure frequency if your current reading is higher than 5 Amps! I am absolutely speechless! Fluke has got to be bullshitting me!

A close up on AC measuring will follow in version 2.0.

Measuring DC Amps:

I made a series of readings in different current ranges. The outcome is: the 381 is practically useless for measurements between 0-5 Amps regarding reproduction and accuracy. The clamp meter gives you totally different readings according to the position of the meter. (Note: When I mention the position of the meter, I mean the position of the meter itself, the wire was during lab tests always exactly in the middle of the clamp!) When the meter is in an upright position (**fig g**) or in a horizontal position (**fig i**) the reading varied more than 20%. See the piece of crap display in (**fig h**)

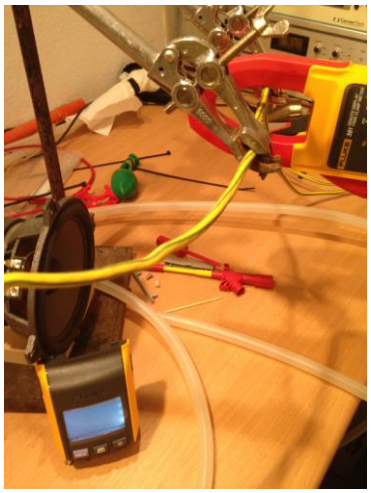

Fig g **fig h** **fig i**

Honestly I can't make myself a rhyme why the readings differ so much by just rotating the meter around the cable axis. Therefore I decided to make some more specific measurements at my university lab in Vienna which will follow up in this review version 2.0... Maybe my homelab ain't adequate…

If measuring from 5 to 50 Amps this weird rotating effect gets better but still has a big effect on the measurements. I'll do some lab tests with higher dc (>500Amps) in this review vers. 2.0 at university lab.

Using the IFlex probe…

turned out to be very very useful if you don't have enough space to use the clamps. Big plus there! I wonder why I can only use the iFlex for AC measurements. DC won't work – so a minus there.

Using the Inrush function:

Haven't got a chance yet to test this function more precicly but I guess in this review vers. 2.0 is more to come!

The Hold Function:

Again its an ordinary HOLD function. That's ok, but why not an Auto Hold like we know and got used to love from a 28 II for eg. ?!?

Conclusion:

Here in Europe the Fluke 381 TRMS Clamp Meter is about 609,00 Euros (that's 800 amazing USD!), a huge shit load of money if you ask me. The meter is missing many important features, features you will find on any other 50 USD multimeter or cheap clampmeter out there.
The exterior is robust made but as you go into some more details and if you are used to the quality of other fluke products, you'll definitely be disappointed. The big selling point of the 381 is the remote display which works quite well, but again going some more into details you'll find out that Fluke has not done their homework right, the display backlight is crap, the magnets need an almost completely even surface to make it stick, etc.

For almost 800 USD you get a clamp meter that offers you the very basic measuring functions with a bad resolution in lower measuring ranges and bad reproductively. In this price range I am really missing things such as: power consumption measuring function for 1 and 3 phase networks, a phase rotation indicator, a diode tester, or maybe a data logger. I'm not saying, that I expect Fluke to make a clamp meter that can do entire network testing, but compared to Flukes competitors in this price class you get way more measuring options than from the 381.

Even though this review isn't complete yet, the 381 is a big disappointment for me. In the following version 2.0 of this review I'll try to go through the rest of the functions, maybe also the power on functions and I will do more reporting from some more heavy industrial field testings, because this seems to be the only practical environment for this clamp meter.